Draft Environmental Impact Report for the Bay Area Air Quality Management District

Regulation 11-18: Toxic Risk Reduction Rule
Regulation 12-16: Petroleum Refining Emissions Limits and Risk Thresholds

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INTRODUCTION AND EXECUTIVE SUMMARY

1.0 INTRODUCTION AND EXECUTIVE SUMMARY

1.1 INTRODUCTION

The Bay Area Air Quality Management District (BAAQMD or Air District) was established in 1955 by the California Legislature to control air pollution in the counties around San Francisco Bay and to attain federal air quality standards by the dates specified in federal law. There have been significant improvements in air quality in the Bay Area over the last several decades. The BAAQMD is also required to meet state standards by the earliest date achievable.

Petroleum refineries are significant sources of pollutants on both the global (greenhouse gases) and regional/local scale (criteria pollutants and toxic air contaminants). Refineries are extremely large and complex facilities comprising many plants (or process units) that function to refine crude oil into various products such as gasoline, diesel fuel, jet fuel, and asphalt. While historically, refinery emissions have tended to decrease overall over time, it is possible that, as refinery operations change in the future, emissions of these pollutants could increase. Some of the factors that can result in increased refinery emissions include higher production rates to meet increased demand or compensate for loss of production in other regions, upset conditions and accidents, and changes in crude oil or product slates. In response to these concerns, the Board of Directors of the Air District has directed staff to bring forward two draft rules for their consideration, one that reflects policy recommended by environmental advocacy organizations, and a second that follows an approach recommended by Air District staff.

Communities for a Better Environment and several associated organizations (CBE) have developed a concept and the Board of Directors have directed Air District staff to develop regulatory language reflecting that concept into new Regulation 12, Rule 16: Petroleum Refining Facility-Wide Emissions Limits (Rule 12-16 or "Refining Caps Rule"). This rule would set numeric limits on specific refinery emissions. Rule 12-16 would apply only to the Bay Area's five petroleum refineries and three facilities associated with the refineries.

The staff of the Air District has developed a different approach that directly addresses concerns about health risks to the refinery communities. The staff recommendation is that the Air District adopt new Regulation 11, Rule 18: Reduction of Risk from Air Toxic Emissions at Existing Facilities (Rule 11-18 or "Toxic Risk Reduction Rule"). Rule 11-18 would apply to all facilities whose emissions of toxic air contaminants may result in a significant risk to nearby residents and workers – this would include petroleum refineries. The purpose of Rule 11-18 is to focus on those facilities causing the highest health impacts across the Bay Area and to require these facilities to reduce that health risk. The draft rule would potentially affect hundreds of facilities, including data centers, petroleum refineries, a cement kiln, gasoline dispensing facilities, etc. These facilities emit a variety of TACs that can adversely impact public health. These pollutants include compounds such as diesel particulate matter (DPM), benzene, polycyclic aromatic hydrocarbons (PAHs), and 1,3-butadiene. These toxic emissions are disproportionately impacting vulnerable communities in the Bay Area. Therefore, any risk reduction from existing facilities achieved by this rule is expected to provide greater benefit to these communities.

This EIR addresses the impacts due to implementation of Regulation 11-18, Toxic Risk Reduction Rule; and Regulation 12, Rule 16, Refining Caps Rule. The development of these rules 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.

1.2 CALIFORNIA ENVIRONMENTAL QUALITY ACT

The California Environmental Quality Act (CEQA), Public Resources Code Section 21000 et seq., requires that the potential environmental impacts of proposed projects be evaluated and that feasible methods to reduce or avoid identified significant adverse environmental impacts of these projects be identified. To fulfill the purpose and intent of CEQA, the Air District has prepared this Environmental Impact Report (EIR) under the requirements of CEQA Guidelines §15187 to address the potential environmental impacts associated with the proposed Regulation 11-18 and 12-16. Prior to making a decision on the adoption of the proposed Toxic Risk Reduction Rule and the Refinery Caps Rule, the Air District Governing Board must review and certify the EIR as providing adequate information on the potential adverse environmental impacts of implementing the proposed new Rules.

1.2.1 NOTICE OF PREPARATION/INITIAL STUDY

A Notice of Preparation for the Draft EIR for Regulation 11-18, the Toxics Risk Reduction Rule, and 12-16, the Refinery Caps Rule (included as Appendix A of this EIR) was distributed to responsible agencies and interested parties for a 30-day review on October 16, 2016. A notice of the availability of this document was distributed to other agencies and organizations and was placed on the Air District's web site, and was also published in newspapers throughout the area of the Air District's jurisdiction. Six public comment letters were submitted on the NOP to the Air District and are included in Appendix A of this EIR.

The NOP/IS identified the following environmental resources as being potentially significant, requiring further analysis in the EIR: air quality, greenhouse gases, hazards and hazardous materials, hydrology and water quality, and utilities and service systems. Please note that the hydrology and water quality impacts were determined to be potentially significant due to the potential increase in water demand. The utilities and service systems impacts were also determined to be potentially significant due to increased water demand. To avoid repetition, the potential water demand impacts have been consolidated and evaluated under hydrology and water impacts (only). The following environmental resources were considered to be less than significant in the NOP/IS: aesthetics, agriculture and forestry resources, biological resources, cultural resources, geology/soils, land use/planning, mineral resources, noise, population/ housing, public services, recreation, transportation/ traffic, and utilities/service systems (see Appendix A).

1.2.2 TYPE OF EIR

In accordance with §15121(a) of the State CEQA Guidelines (California Administrative Code, Title 14, Division 6, Chapter 3), the purpose of an EIR is to serve as an informational document that: "will inform public agency decision-makers and the public generally of the significant environmental effect of a project, identify possible ways to minimize the significant effects, and describe reasonable alternatives to the project." The EIR is an informational document for use by decision-makers, public agencies and the general public. The proposed project requires discretionary approval and, therefore, it is subject to the requirements of CEQA (Public Resources Code, §21000 et seq.).

The focus of this EIR is to address the environmental impacts of the implementation of Regulations 11-18 and 12-16 as identified in the NOP and Initial Study (included as Appendix A of this EIR). The degree of specificity required in an EIR corresponds to the degree of specificity involved in the underlying activity described in the EIR (CEQA Guidelines §15146). Regulation 12-16 would establish maximum refinery-wide emissions limits for nitrogen oxides (NOx), sulfur dioxide (SO_2), particulate matter and GHGs at five refineries and three associated facilities in the Air District. If limits and thresholds are exceeded, additional emission reductions would be required. Regulation 11-18 would apply to a much larger variety of sources and focus on those facilities causing the highest health impacts across the Bay Area and to require these facilities to reduce that health risk. Since the need for emission reductions has not yet been determined, the actual control measures that will be required to reduce emissions, if any, is unknown. Therefore, the EIR evaluates the impacts of potential emissions control measures that could be utilized.

1.2.3 INTENDED USES OF THIS DOCUMENT

In general, a CEQA document is an informational document that informs a public agency's decision-makers, and the public generally, of potentially significant adverse environmental effects of a project, identifies possible ways to avoid or minimize the significant effects, and describes reasonable alternatives to the project (CEQA Guidelines §15121). A public agency's decision-makers must consider the information in a CEQA document prior to making a decision on the project. Accordingly, this EIR is intended to: (a) provide the Air District's Board of Directors and the public with information on the environmental effects of the proposed project; and, (b) be used as a tool by the Air District's Board to facilitate decision making on the proposed project.

Additionally, CEQA Guidelines §15124(d)(1) requires a public agency to identify the following specific types of intended uses of a CEQA document:

1. A list of the agencies that are expected to use the EIR in their decision-making;
2. A list of permits and other approvals required to implement the project; and
3. A list of related environmental review and consultation requirements required by federal, state, or local laws, regulations, or policies.

Local public agencies, such as cities, and counties could be expected to tier off this EIR if local approval is required for the installation of air pollution control equipment that may be required when implementing Rule 11-18 or 12-16, pursuant to CEQA Guidelines §15152. There is no State, federal or local permits required to adopt either of the proposed rules. However, implementation of the rules could require permits from local governments (e.g., counties with land use approval).

1.2.4 AREAS OF POTENTIAL CONTROVERSY

In accordance with CEQA Guidelines §15123(b)(2), the areas of controversy known to the lead agency including issues raised by agencies and the public shall be identified in the EIR. As noted above, six comment letters were received on the NOP/IS. Issues and concerns raised in the comment letters included: (1) concerns that the District has piecemealed the CEQA refinery projects; (2) concerns that refinery expansion projects and trends toward increased exports have not been included; (3) concerns about potential legal conflicts and consistency with the Clean Air Act; (4) an adequate environmental setting should be included; (5) an alternative to use the 25/M risk threshold option; and (6) cross-media environmental impacts should be evaluated. Copies of the comment letters are provided in Appendix A.

1.3 EXECUTIVE SUMMARY: CHAPTER 2 – PROJECT DESCRIPTION

Petroleum refineries are sources of harmful pollutants on a global (climate pollutants i.e., greenhouse gases), regional (criteria pollutants), and local scale (toxic air contaminants and particulate matter). Many Bay Area residents have expressed concern about the impact of this pollution on the environment and public health, particularly those that may disproportionately impact communities near refineries. Though refinery emissions have declined over time, it is possible that as refinery operations change in the future, emissions of these pollutants could increase. In response to these concerns, the Board of Directors of the Air District has directed staff to bring forward two rules for their consideration: one that reflects policy recommended by some environmental advocacy organizations; and an approach recommended by Air District staff.

Communities for a Better Environment (CBE) and several associated organizations have recommended that the Air District adopt new Regulation 12, Rule 16: Petroleum Refining Facility-Wide Emissions Limits (Rule 12-16 or “Refining Caps Rule”). This rule would set numeric limits on specific refinery emissions. Rule 12-16 would apply only to the Bay Area’s five petroleum refineries and three facilities associated with the refineries.

The staff of the Air District has developed a different approach that directly addresses concerns about health risks to communities exposed to air pollution. The staff recommendation is that the Air District adopt a new Regulation 11, Rule 18: Reduction of Risk from Air Toxic Emissions at Existing Facilities (Rule 11-18 or “Toxic Risk Reduction Rule”). Rule 11-18 would apply to all facilities in the Bay Area whose emissions of toxic air contaminants may result in a significant risk to nearby residents and workers, including petroleum refineries. The purpose of Rule 11-18 is to reduce the public’s exposure to health risks associated with the emissions of toxic air contaminants (TACs) from stationary sources by reducing those risks to the lowest feasible levels.

1.3.1 Rule 12-16 – Refinery Emissions Caps Rule

Rule 12-16 reflects a policy recommendation from CBE and their associated organizations. The rule, as proposed by CBE, would limit the emissions of climate pollutants and three criteria pollutants: greenhouse gases (GHGs), particulate matter (PM), oxides of nitrogen (NOx), and sulfur dioxide (SO_2) from petroleum refineries and three associated facilities. The rule would establish facility-wide emissions limits for the covered pollutants at each of the affected facilities to ensure that each facility does not increase emissions due to changes in operation, crude or product slates; or increases in production. Each facility's emissions limits would be set at the maximum-annual emissions reported for that facility in the period from 2011 through 2015 with an additional allowance or "threshold factor" of seven percent over the maximum annual emission rate for each pollutant.

1.3.2 Rule 11-18 – Toxic Risk Reduction Rule

Rule 11-18, as drafted by Air District staff, would ensure that emissions of TACs from existing facilities do not pose an unacceptable health risk to people living and working nearby. The rule would use the most up-to-date assumptions about the risk of compounds and would require the facility to take action to reduce risk below a specified risk threshold if the facility exceeds the risk thresholds. If the facility could not devise a means to reduce the risk below the specified risk level, the facility would be required to install best available retrofit control technology for toxic pollutants (TBARCT) on every significant source of TAC emissions at the facility.

1.3.3 PROJECT OBJECTIVES

The objectives of Toxic Risk Reduction Rule (Reg. 11-18) are to:

- Reduce the public's exposure to health risks associated with the emissions of TACs from stationary sources to the lowest levels achievable;
- Incorporate the most up-to-date health risk methodologies and health values into the Air District's risk evaluation process for existing stationary sources of TACs;
- Ensure the facilities that impact the most sensitive and overburdened communities reduce their associated health risk in an efficient and expeditious manner;
- Provide the public opportunity to comment on the draft HRAs to provide transparency and clarity to the process; and
- Provide the public opportunity to comment on risk reduction plans as they are drafted by the affected facilities.

The objectives of the Refining Emission Caps Rule (Reg. 12-16) are to:

- Protect air quality, public health, and the climate from increases in annual facility-wide mass emissions of GHGs, PM, NOx, and SO_2 caused by changes in refinery oil feed quality or quantity, refinery or support equipment or operation, or combinations of these causes, by preventing any significant increase in these emissions;

- Protect the climate and public health by preventing any significant increase in these emissions at refineries and associated facilities from increasing the emission intensity of the production of transportation fuels;

- Protect community and public health by preventing any significant increase in these emissions from worsening hazards for which HRA methods may not account, including but not limited to acute and chronic ambient NOx, SOx, and PM exposure hazards;

- Complement other air quality, public health, and climate measures by discouraging investment in new refinery equipment that would lead to increased emissions of GHG, PM, NOx, or SOx from Bay Area refineries.

1.3.3.1 Sources Affected by Regulations 11-18 and 12-16 and Applicable Control Technologies

Regulation 12-16 would apply to the five refineries and three support facilities in the Bay Area. Rule 11-18 would apply to sources that generate TAC emissions and include a variety of emission sources, as identified below.

- Refineries
- Data Centers
- Cement Manufacturing
- Chemical Plants
- Crematoria
- Landfills
- Foundries
- Sewage Treatment Facilities
- Power Plants
- Gasoline Stations
- Military Facilities
- Manufacturing Facilities

1.4 EXECUTIVE SUMMARY: CHAPTER 3 – ENVIRONMENTAL SETTING, IMPACTS AND MITIGATION MEASURES

This chapter of the Draft EIR describes the existing environmental setting in the Bay Area, analyzes the potential environmental impacts of Rules 11-18 and 12-16 and recommends mitigation measures (when significant environmental impacts have been identified). The chapter provides this analysis for each of the environmental areas identified in the Initial Study (see Appendix A), including: (1) Air quality; (2) Climate change and greenhouse gas emissions; (3) Hazards; and (4) Hydrology and water quality. Included for each impact category is a discussion of the environmental setting, significance criteria, whether the 2017 Plan will result in any significant impacts (either from the Plan individually or cumulatively in conjunction with other projects), and feasible project-specific mitigation (if necessary and available). The Initial Study concluded that potential water demand impact on hydrology/water quality and utilities/service systems were potentially significant. Note that the potential water demand impacts have been consolidated into one discussion under hydrology and water quality to avoid repetition.

1.4.1 AIR QUALITY

1.4.1.1 Air Quality Setting

It is the responsibility of the Air District to ensure that State and federal ambient air quality standards are achieved and maintained in its geographical jurisdiction. Health-based air quality standards have been established by California and the federal government for the following criteria air pollutants: ozone, CO, nitrogen dioxide (NO_2), particulate matter (PM10 and PM2.5), sulfur dioxide (SO_2), and lead. These standards were established to protect sensitive receptors with a margin of safety from adverse health impacts due to exposure to air pollution. California has also established standards for sulfate, visibility, hydrogen sulfide, and vinyl chloride.

The Air District is in attainment of the State Ambient Air Quality Standards for CO NO_2, and SO_2. However, the Bay Area does not comply with the State 24-hour PM10 standard. The Air district is unclassifiable/attainment for the federal NO, NO_2, SO_2, lead, and PM10 standards. A designation of unclassifiable/attainment means that the U.S. EPA has determined to have sufficient evidence to find the area either is attaining or is likely attaining the National Ambient Air Quality Standards. The Bay Area is designated as a non-attainment area for the federal and state 8-hour ozone standard and the federal 24-hour PM2.5 standard. The State 8-hour standard was exceeded on 12 days in 2015 in the Air District; most frequently in the Eastern District (Livermore, Patterson Pass, and San Ramon). The federal 8-hour standard was exceeded on 12 days in 2015.

The Air District monitors and maintains databases that contains information concerning criteria pollutant and TAC emissions from sources in the Bay Area. The criteria pollutant emission concentrations and inventory data are used to determine compliance with state and federal ambient air quality standards as well as to determine the most appropriate approach to complying with ambient air quality standards. TAC emission inventories are used to plan strategies to reduce public exposure to TACs. The primary health risk of concern due to exposure to TACs is the risk of contracting cancer. The carcinogenic potential of TACs is a particular public health concern because many scientists currently believe that there are not "safe" levels of exposure to carcinogens without some risk to causing cancer. Based on ambient air quality monitoring, and using OEHHA cancer risk factors, the estimated lifetime cancer risk for Bay Area residents, over a 70-year lifespan from all TACs combined, declined from 4,100 cases per million in 1990 to 690 cases per million people in 2014.

1.4.1.2 Air Quality Impacts

Rule 11-18: Based on the evaluation of those air pollution control technologies that would most likely be the used to reduce TAC emissions from affected facilities if required pursuant to Rule 11-18, construction and secondary operational air quality impacts from the proposed project could generate NOx emissions that exceed the Air District's construction and operations emission thresholds. Therefore, construction and operational air quality impacts are concluded to be significant for NOx emissions. Emissions of ROG, PM10 and PM2.5 were determined to be less than significant during both construction and operational phases associated with implementation of Rule 11-18.

Rule 12-16: Based on the evaluation of those air pollution control technologies that would most likely be the used to reduce GHG, PM2.5, PM10, NOx and SO_2 emissions from affected refinery and refinery-related facilities if required pursuant to Rule 12-16, operational air quality impacts from the proposed project would not exceed the Air District's operations emission thresholds for ROG, NOx, PM10 or PM2.5 and are considered to be less than significant. However, construction air quality impacts from the proposed project could generate NOx emissions that exceed the Air District's construction emission thresholds. Therefore, air quality impacts are concluded to be significant for NOx emissions during construction activities. Potential air quality impacts for ROG, PM10 and PM2.5 were determined to be less than significant during construction activities.

Based on the evaluation of those air pollution control technologies that would most likely be the used to reduce PM2.5, PM10, NOx, SO_2, and TAC emissions from affected facilities if both Rules 11-18 and 12-16 were adopted, construction and secondary operational air quality impacts from the proposed project could generate NOx emissions that exceed the Air District's construction and operations emission thresholds. Therefore, construction and operational air quality impacts are concluded to be significant for NOx emissions. Potential air quality impacts for ROG, PM10 and PM2.5 were determined to be less than significant during construction and operational activities, if both Rules 11-18 and 12-16 are implemented. Cumulative impacts associated with NOx emissions during both construction and operation are also considered to be cumulatively significant due to the potential exceedance of significance thresholds under a worst-case analysis.

Mitigation measures were identified for the potentially significant NOx emissions associated with construction and operational activities; nonetheless, it is likely that these emissions would remain significant following mitigation.

1.4.2 GREENHOUSE GAS EMISSIONS

1.4.2.1 Greenhouse Gas Emissions Setting

Global climate change refers to changes in average climatic conditions on the earth as a whole, including temperature, wind patterns, precipitation and storms. Global warming, a related concept, is the observed increase in the average temperature of the earth's surface and atmosphere. One identified cause of global warming is an increase of GHGs in the atmosphere. The six major GHGs identified by the Kyoto Protocol are CO_2, methane (CH_4), nitrous oxide (N_2O), sulfur hexafluoride (SF_6), haloalkanes (HFCs), and perfluorocarbons (PFCs), plus black carbon.

It is the increased accumulation of GHGs in the atmosphere that may result in global climate change. Climate change involves complex interactions and changing likelihoods of diverse impacts. Due to the complexity of conditions and interactions affecting global climate change, it is not possible to predict the specific impact, if any, attributable to GHG emissions associated with a single project, which is why GHG emission impacts are considered to be a cumulative impact.

Transportation sources generate approximately 40 percent of the total GHG emissions in the District. The remaining 60 percent of the total District GHG emissions are from stationary and area sources.

1.4.2.2 Greenhouse Gas Emissions Impacts

Most GHG emissions sources at facilities that would be regulated by either Rule 11-18 or Rule 12-16 would include equipment or processes, primarily combustion sources that are part of the facilities' operations. Though the proposed project may include combustion processes that could generate GHG emissions such as CO_2, CH_4, and N_2O, the proposed project does not affect equipment or operations that have the potential to emit other GHGs such as sulfur hexafluoride (SF6), hydrofluorocarbon (HFC) or perfluorocarbon (PFC). GHGs could be emitted during construction activities to install air pollution control equipment from sources such as off-road construction equipment, which could be comprised of off-road mobile sources, e.g., bull dozers, cranes, forklifts, etc. GHGs could also be emitted during construction from on-road mobile sources such as haul trucks delivering products used in the pollution control process and construction worker commute trips. During operation, GHG emission impacts could occur from air pollution control equipment that uses combustion as part of the control process such as thermal oxidizers and the regeneration process for carbon adsorption. GHG emissions would also be generated by increased use of electricity and increased mobile source emissions associated with material deliveries (e.g., sodium hydroxide used in wet gas scrubbers or ammonia used in SCRs)

Rule 11-18: Greenhouse gas impacts associated with the implementation of air pollution control equipment for the reduction of TAC emissions under Rule 11-18 were found to potentially exceed the Air District's GHG significance threshold of 10,000 MTCO2e/yr and are therefore found to be significant.

<u>Rule 12-16:</u> Greenhouse gas impacts associated with the implementation of air pollution control equipment for the potential reduction of refinery emissions under Rule 12-16 were found to be less than the Air District's operational GHG significance threshold of 10,000 MTCO2e/yr and are therefore found to be less than significant.

If both rules are adopted, cumulative GHG emission impacts would be greater than either rule alone. GHG emissions would exceed the significance threshold and, therefore, would be significant. It should be noted that GHG emission increases due to implementation of Rule 11-18 and 12-16 from facilities that are regulated under CARB's Cap and Trade Program would be offset. There is no specific information as to what facilities would be located; therefore, it is speculative to assume that all GHG emissions would be offset under the AB 32 Cap and Trade Program. To present a conservative analysis no AB32 Cap and Trade allowances were included in the impact analysis.

A review of the GHG emissions reported by refineries and associated facilities indicates that the proposed refinery limitations in Rule 12-16 would not be expected to conflict with CARB's Cap and Trade program because covered entities could continue to use GHG credits for compliance purposes. That data may not be predictive of future scenarios; however, it is the only data available at this time. Presuming continuing increases in gasoline consumption results in unreasonable levels of speculation. For example, it is impossible for the Air District to predict the exact level of gasoline consumption in 2018 and how that would relate to Bay Area refinery capacity and how the market might react if production at Bay Area refineries were constrained by Rule 12-16. Therefore, the Air District is assuming, based on historical data that potential GHG emission impacts from the proposed project are concluded to be less than significant.

1.4.3 HAZARDS AND HAZARDOUS MATERIALS

1.4.3.1 Hazards and Hazardous Materials Setting

The potential for hazards exist in the production, use, storage and transportation of hazardous materials. Hazardous materials may be found at industrial production and processing facilities. Some facilities produce hazardous materials as their end product, while others use such materials as an input to their production process. Examples of hazardous materials used as consumer products include gasoline, solvents, and coatings/paints. Hazardous materials are stored at facilities that produce such materials and at facilities where hazardous materials are a part of the production process. Currently, hazardous materials are transported throughout the district in great quantities via all modes of transportation including rail, highway, water, air, and pipeline.

The potential hazards associated with industrial activities are a function of the materials being processed, processing systems, and procedures used to operate and maintain the facility. The hazards that are likely to exist are identified by the physical and chemical properties of the materials being handled and their process conditions and include: (1) toxic gas clouds due to releases of volatile chemicals; (2) fires or explosions; (3) thermal radiation from the heat generated by a fire; and (4) explosion and overpressure when vessels containing flammable explosive vapors and potential ignition sources are combined.

In 2015, there were a total of 1,272 hazardous materials incidents reported in the nine counties regulated by the Air District, with the most incidents (292) reported in Alameda County. Hazardous materials incidents during transportation, at waterways, and at commercial facilities were the most common locations, respectively, for hazardous materials incidents. About 17 percent of the hazardous materials incidents that occurred within California occurred within the nine counties that comprise the Bay Area, with spills in industrial areas the most common (27 percent), followed by waterways (22 percent) and commercial areas (20 percent).

1.4.3.2 Hazards and Hazardous Materials Impacts

Rule 11-18: Proposed Rule 11-18 is designed to reduce health risk associated with emissions of TACs from existing stationary sources in the Bay Area. The proposed rule is not expected to require substantial new development. Any new air pollution control equipment or enclosures would be expected to occur within existing commercial or industrial facilities. Facility modifications associated with the proposed rule are largely expected to include limiting throughput or hours of operations; increased use of diesel particulate filters; additional enclosures and bag houses, and thermal oxidizers or carbon adsorption systems. The hazards associated with the use of these types of air pollution control equipment and systems are minimal.

Rule 12-16: For any refineries that are shown to exceed the refinery-wide emissions limits for NOx, SO_2, particulate matter or GHGs, it is expected that refinery operators would install new or modify their existing air pollution control equipment in order to reduce the applicable emissions to comply with Rule 12-16 requirements. Because refineries handle a number of hazardous materials, potential hazards and hazardous materials impacts already exist; are generally common to most oil processing facilities worldwide; and are a function of the materials being processed, processing systems, procedures used for operating and maintaining the facility, and hazard detection, and mitigation systems. The major types of public safety risks at a refinery consist of risks from accidental releases of regulated substances and from major fires and explosions. Additionally, air pollution control equipment that may be installed to obtain further reductions in NOx, SO_2, particulate matter or GHGs emissions have the potential to generate hazard or hazardous materials impacts.

Assuming the adoption of both rules, it would be expected that more air pollution control equipment would be required to be installed as additional TAC emissions would be controlled, as well as additional refineries emissions may also be required to be controlled. As discussed in Chapter 3.4.4, installation of most air pollution control equipment would not generate additional hazard impacts. Only baghouses and wet electrostatic precipitators were found to be potentially significant without mitigation; however, the potentially adverse hazard impacts associated with the installation of baghouses and ESPs are expected to be less than significant after mitigation for both Rules 11-18 and 12-16, individually or combined. Additionally, because hazards and hazardous materials impacts do not exceed the applicable hazards and hazardous materials significance thresholds, they are not considered to be cumulatively considerable (CEQA Guidelines §15064 (h)(1)) and, therefore are not expected to generate significant adverse cumulative hazards and hazardous materials impacts.

1.4.4 HYDROLOGY AND WATER QUALITY

1.4.4.1 Hydrology and Water Quality Setting

The District is within the San Francisco Bay Hydrologic Region (Bay Region) which includes all of San Francisco County and portions of Marin, Sonoma, Napa, Solano, San Mateo, Santa Clara, Contra Costa, and Alameda counties. It occupies approximately 4,500 square miles; from southern Santa Clara County to Tomales Bay in Marine County; and inland to near the confluence of the Sacramento and San Joaquin rivers at the eastern end of Suisun Bay. The eastern boundary follows the crest of the Coast Ranges, where the highest peaks are more than 4,000 feet above mean sea level.

The most prominent surface water body in the Bay Region is San Francisco Bay itself. Other surface water bodies include: Creeks and rivers; ocean bays and lagoons (such as Bolinas Bay and Lagoon, Half Moon Bay, and Tomales Bay); urban lakes (such as Lake Merced and Lake Merritt); human-made lakes and reservoirs (such as Lafayette Reservoir, Briones Reservoir, Calaveras Reservoir, Crystal Springs Reservoir, Kent Lake, Lake Chabot, Lake Hennessey, Nicasio Reservoir, San Andreas Lake, San Antonio Reservoir, San Pablo Reservoir, Upper San Leandro Reservoir, Anderson Reservoir, and Lake Del Valle).

The Bay Area relies on imported water, local surface water, and groundwater for water supply. Local supplies account for about 30 percent of the total, and the remaining supply is imported from the State Water Project (SWP), Central Valley Project (CVP), and the Mokelumne and Tuolumne watersheds. In 2010, water demand in the region was 1,278,480 acre-feet per year (af/yr)[1]. Demand is projected to grow to 1,680,963 af/yr in a normal year, and 1,666,870 af/yr in a single dry year by 2035.

Some water agencies in the region have imported water from the Sierra Nevada for nearly a century to supply customers. The East Bay Municipal Utility District (EBMUD) and San Francisco Public Utilities Commission (SFPUC) import surface water into the Bay Region from the Mokelumne and Tuolumne rivers via the Mokelumne and Hetch Hetchy aqueducts, respectively. Water from these two rivers accounts for approximately 38 percent of the average annual water supply in the Bay Area. Water from the Sacramento-San Joaquin Delta (Delta), via the federal CVP and the SWP, accounts for another 28 percent. Approximately 31 percent of the average annual water supply in the Bay Area comes from local groundwater and surface water; and three percent is from miscellaneous sources such as harvested rainwater, recycled water, and transferred water.

As discussed in the Initial Study, implementation of Rule 11-18 would reduce risk from facilities that emit toxic air contaminants throughout the Bay Area. Risk reduction measures are expected to be limited to new air pollution control equipment and construction of enclosures. The NOP/IS concluded that wet gas scrubbers were not expected to be used to control TACs; therefore, implementation of Rule 11-18 was not expected to result in a substantial increase in water use or wastewater discharge. However, public comments received on the NOP/IS indicated that wet gas scrubbers could be used to control TAC emissions from some refinery sources, such as FCCUs.

[1] One acre-foot of water is equal to approximately 325,851 gallons.

1.4.4.2 Hydrology and Water Quality Impacts

Implementation of Rule 12-16 would prevent refinery emissions of GHGs and some criteria pollutants from increasing. However, Rule 12-16 could require the installation of additional air pollution control equipment or modifications to refinery operations. Control measures for particulate matter and/or SOx emissions could require additional water use and wastewater discharge from devices like wet gas scrubbers. The NOP/IS (see Appendix A) determined that potential hydrology and water quality impacts associated with implementation of the proposed new Rule 12-16 are potentially significant. In addition, west gas scrubbers could be used to comply with Rule 11-18 so the potential water demand impacts of wet gas scrubbers under Rule 11-18 have also been evaluated in chapter 3.5 of this EIR.

Rule 11-18: If any stationary sources are shown to exceed threshold limits for toxic air contaminants, it is expected that facility operators could install new, or modify their existing air pollution control equipment in order to reduce TAC emissions under Regulation 11-18. Most air pollution control equipment does not use water or generate wastewater. However, additional water demand and wastewater generation impacts are expected to result from the operation of wet gas scrubbers which may be used for control of particulate TAC emissions.

Rule 12-16: If any refineries are shown to exceed the refinery-wide emissions limits for PM2.5, PM10, NOx or SO_2, it is expected that refinery operators would install new, or modify their existing air pollution control equipment in order to reduce emissions as required by Regulation 12-16. Additional water demand and wastewater generation impacts are expected to result from the operation of several of the possible control technologies that would most likely be used including wet ESPs and wet gas scrubbers.

Wet gas scrubbers installed as a response to Rule 12-16 and/or Rule 11-18 were found to be significant for potential future water demand impacts. Thus, mitigation measures are imposed for the operational use of wet gas scrubbers. However, because of the prevalence of drought conditions in California, in spite of implementing the mitigation measures described in Chapter 3.5.5, water demand impacts during operation of the proposed project remain significant, in part because there is currently no guarantee that reclaimed water will be available to all of the affected facilities. Therefore, the proposed project will remain significant after mitigation for water demand. In addition, water demand impacts during operation of the proposed project are also considered to be cumulatively considerable (CEQA Guidelines §15064 (h)(1)).

Water quality impacts associated with installing various types of air pollution control equipment would not exceed applicable water quality significance thresholds and therefore were found to be less than significant. Additionally, future demand impacts of wet ESPs for compliance with Rule 12-16 were found to be less than significant.

1.4.5 UTILITIES AND SERVICE SYSTEMS

The NOP/IS found that utilities and service system impacts relating to water use and wastewater treatment could be potentially significant. These potential impacts have been thoroughly discussed in Chapter 1.4.4 and Chapter 3.5 (hydrology and water quality) of the DEIR and were found to be less than significant.

1.5 EXECUTIVE SUMMARY: CHAPTER 4 – ALTERNATIVES

An EIR is required to describe a reasonable range of feasible alternatives to the proposed project that could feasibly attain most of the basic project objectives and would avoid or substantially lessen any of the significant environmental impacts of the proposed project (CEQA Guidelines §15126.6(a)). As discussed in Chapter 3 of this EIR the proposed project could result in potentially significant impacts to air quality and GHG emissions during construction and hydrology (water demand) during project operation. An EIR is required to describe a reasonable range of feasible alternatives to the proposed project that could feasibly attain most of the basic project objectives and would avoid or substantially lessen any of the significant environmental impacts of the proposed project (CEQA Guidelines §15126.6(a)).

Since there are two proposed rules being evaluated under this EIR, two "No Project Alternatives," and two Project Alternatives (one each for each of proposed rules) will be consider in this analysis.

1.5.1 Project Alternatives for Proposed Rule 11-18

For proposed Rule 11-18, Alternative 1.1 is the No Project Alternative (11-18). Under the No Project Alternative (11-18), the proposed rule would not be adopted and, thus, the Air District would not establish risk actions levels of 10/M for cancer health risk and 1.0 for both acute and chronic hazard indices. Although, portions of the rule could be implemented under the Air District's AB 2588 – Air Toxics "Hot Spots" Program, such as incorporating the new OEHHA health risk assessment protocols and health risk values and conducting health risk screening analyses and health risk assessments. Facilities with a cancer health risk greater than 10/M or an acute or chronic hazard index greater than 1.0[2] would only have to notify all exposed persons of their exposure. Facilities with a cancer risk greater than 100/M or a hazard indices greater than 10 would have to both 1) notify exposed individuals, and 2) reduce the facility health risk below the risk action level in accordance to the Air District AB 2588 Program, California Health and Safety Code, §§44300-44394.[3]

Under Alternative 1.2, the Air District would establish risk action levels at 25/M for cancer risk and 2.5 for hazard indices instead of 10/M and 1.0 respectively. Further, the significant risk level for the compliance alternative for the application of best available retrofit control technology for toxics (TBARCT) would be set at 5/M for cancer and 0.5 hazard indices or removed.[4] All other

[2] Health risks of 10/M cancer and 1.0 hazard indices are current action levels for notification under the Air District's AB 2588 Air Toxics "Hot Spots" Program.

[3] Health risks of 100/M cancer and 10.0 hazard indices are the current action levels for risk reduction under AB 2588. It should be noted that Air District staff did not identify any facilities with a preliminary health risks greater than these action levels.

[4] Without the TBARCT compliance option, the rule would be, in effect, an implementation of the AB 2588 program with lower risk action levels.

aspects of the proposed rule would remain in place, including the provisions for the two compliance options: developing a risk reduction plan or demonstrating that all significant sources of risk are controlled with TBARCT. Under this alternative, the scope of the project would be significantly reduced because the rule would not apply to those facilities with health risks that are less than 25/M for cancer or 2.5 for hazard indices. As a result, the number of facilities affected by the rule would be reduced by from approximately 1,000 to fewer than 100 – an order of magnitude reduction. the requirements of the rule would still apply to major sources of risk, such as refineries, cement manufacturing, and waste water treatment facilities; however, the level to which those facilities must reduce their health risk would be 25/M instead of 10/M. Under this alternative, the number of individuals that remain exposed to elevated health risk levels posed by these facilities would be much greater than that under the proposal.

Since Alternative 1.2 would eliminate all of the potentially significant impacts and achieve most of the project objectives, it would be considered the environmentally superior alternative.

1.5.2 Project Alternatives for Proposed Rule 12-16

For proposed Rule 12-16, Alternative 2.1 is the No Project Alternative (12-16). Under the No Project Alternative (12-16), the proposed rule would not be adopted and, thus, facility-wide emissions limits on GHGs, PM (PM_{10} and $PM_{2.5}$), NOx, and SO_2 would not be established. Therefore, the control of these emissions would likely continue to be addressed by the Air District current suite of programs, rules, regulations and any future measures contained in the draft 2017 Clean Air Plan and the State statues affecting climate pollutants. These methods of control include:

- Air District Rules affecting emissions of PM, NOx, and SO_2 from refineries and associated facilities.
- Control measures in the 2010 CAP not yet adopted;
- Rules and rule amendments in the Refinery Strategy;
- Control measures in draft 2017 CAP (not too speculative), including Rule 13.1; and
- AB 32 Cap and Trade Program, SB 32 and AB 197

The primary differences between Rule 12-16 and the No Project Alternative (12-16) is that the collection of measures listed referenced above would not only prevent the increase of climate and combustion criteria pollutants, but would result in substantial decreases of these pollutants over time (the proposal does not require emissions reductions).

Alternative 2.2 would be the implementation of the combination of proposed 11-18 and draft Rule 13-1. This alternative would consist of a combination of the environmental benefits and impacts of adopting and implementing proposed Rule 12-16 and draft Rule 13-1. Under this alternative, Rule 11-18 would reduce refinery health risks due to the emissions of toxic air contaminants to the lowest achievable levels, greatly reducing the health risks experienced by communities from refinery toxic emissions. Under proposed Rule 11-18, facilities that posed a health risk greater than the risk action levels of 10/M for cancer and 1.0 for hazard indices would have to either 1) reduce the facility health risk below the actions levels through the implementation of a risk reduction plan, or 2) demonstrate that all significant sources of risk at the facility are controlled with TBARCT.

Further, draft Rule 13-1 would ensure that refinery emission of GHGs are either limited to their current maximum capacity or are constrained by the refineries' carbon intensity based on their maximum capacity (also incorporating cost-saving energy efficiency measures). Draft Rule13-1 would complement and serve as a backstop for State climate protection efforts, which are anticipated to require a 20 percent reduction in refinery GHG emissions by 2030. Draft Rule 13-1 would:

- Set a carbon intensity limit for each refinery consistent with current operations
- Set a mass-based GHG emissions limit as an alternate compliance option
- Provide incentives for new energy improvement projects
- Accommodate new regulatory requirements and Air District permits

Since Alternative 2.2 would eliminate all of the potentially significant impacts and achieve all of the project objectives, it would be considered the environmentally superior alternative, providing an improvement in air quality not provided by the other project alternatives.

1.8 EXECUTIVE SUMMARY: CHAPTER 5

Chapter 5 provides the references used in the preparation of the EIR.

TABLE 1-1

Summary of Environmental Impacts, Mitigation Measures and Residual Impacts

Impact	Mitigation Measures	Residual Impacts
Air Quality		
The construction activities that may be required to implement Rule 11-18 and Rule 12-16 may result in NOx emissions that would exceed the significance thresholds resulting in potentially significant air quality impacts.	Develop a Construction Emission Management Plan; to minimize emissions from vehicles and trucks; limit truck idling; maintain construction equipment to manufacturer's recommendations; identify construction areas served by electricity; Use cranes rate 200 hp or greater with Tier 4 engines or equivalent (if available); and use off-road equipment rated 50 to 200 hp with Tier 4 or equivalent engines (if available).	NOx emissions during construction activities are potentially significant under Rules 11-18 and Rules 12-16 following mitigation, but would cease when construction activities are complete.
Construction activities that may be required to implement Rule 11-18 and Rules 12-16 are expected to result in emissions of ROG, PM10 and PM2.5 that would be less than significant.	None Required	Construction emissions of ROG, PM10 and PM2.5 would be less than significant under Rules 11-18 and 12-16.
The annual NOx emission threshold may be exceed due to implementation of Rule 11-18.	None identified for the control of emissions from air pollution control equipment as the equipment is considered BACT.	Operational emissions of NOx would remain significant due to implementation of Rule 11-18.
The NOx emission thresholds exceed due to implementation of Rule 12-16 are not expected to be exceeded.	None Required	Operational emissions of NOx would be less than significant due to implementation of Rule 12-16.
Operational activities that may be required to implement Rule 11-18 and Rules 12-16 are expected to result in emissions of ROG, PM10 and PM2.5 that would be less than significant.	None Required	Construction emissions of ROG, PM10 and PM2.5 would be less than significant.
TAC emissions associated with implementation of Rule 11-18 and 12-16 are expected to be less than significant.	None Required	Potential TAC emissions under Rules 11-18 and 12-16 are less than significant.

TABLE 1-1

Summary of Environmental Impacts, Mitigation Measures and Residual Impacts

Impact	Mitigation Measures	Residual Impacts
Greenhouse Gas Emissions		
Air pollution control technologies that would most likely be implemented under Rule 11-18 could generate GHG emission impacts that would be considered significant.	None identified but some GHG emissions may be offset under the AB32 Cap and Trade Program. .	GHG emissions are expected to remain significant under Rule 11-18.
Air pollution control technologies that would most likely be implemented under Rule 12-16 is expected to generate GHG emission that would be considered less than significant.	None Required.	GHG emissions are expected to be less than significant under Rule 12-16.
Hazards and Hazardous Materials		
Fire or explosion impacts from the use of baghouses under Rules 12-16 or 11-18 are potentially significant.	Mitigation measures include a comprehensive dust control program; ground filter elements; install explosion rupture panels; remove dusts from filters prior to replacing filters; perform hot work away from collectors; do not use power tools in areas with high dust concentrations; and ensure adherence to applicable NFPA standards.	Hazards impacts from the use of baghouses are expected to be less than significant following mitigation.
Fire or explosion impacts from the use of dry ESPs under Rules 12-16 are potentially significant.	Mitigation measures include using CO sensors; digital electronic controls; covering wires with shrouds; and conduct routine inspections. None required.	Hazards associated with the use of dry ESPs are expected to be less than significant following mitigation.
Transportation and use of hazardous materials in SCRs and WGS are expected to remain less than significant under 11-18 and/or 12-16	None Required	Transportation and use of hazardous materials would remain less than significant. d
Hydrology and Water Quality		
The potential water demand created by the need for new air pollution control equipment, particularly wet gas scrubbers, would result in a significant impact on water demand associated with both Rules 11-18 and 12-16.	Mitigation measures include the requirement to use recycled water, if available.	Water demand impacts are expected to remain significant under both Rules 11-18 and 12-16.

TABLE 1-1

Summary of Environmental Impacts, Mitigation Measures and Residual Impacts

Impact	Mitigation Measures	Residual Impacts
Wastewater generated from the installation of air pollution control equipment to comply with Rule 11-18 or 12-16 are not expected to exceed any applicable water quality significance thresholds. Therefore, no wastewater impacts are expected.	None required.	Wastewater impacts are expected to remain less than significant.

CHAPTER 2

PROJECT DESCRIPTION

2.0 PROJECT DESCRIPTION

2.1 INTRODUCTION

Petroleum refineries are significant sources of harmful pollutants on both the global (climate pollutants i.e., greenhouse gases), regional (criteria pollutants), and local scale (toxic air contaminants and particulate matter). Many Bay Area residents have expressed concern about the impact of this pollution on the environment and public health, particularly those that may disproportionately impact communities near refineries. Though refinery emissions have declined over time, it is possible that as refinery operations change in the future, emissions of these pollutants could increase. In response to these concerns, the Board of Directors of the Bay Area Air Quality Management District (Air District) has directed staff to bring forward two rules for their consideration: one that reflects policy recommended by some environmental advocacy organizations; and an approach recommended by Air District staff.

Communities for a Better Environment (CBE) and several associated organizations have recommended that the Air District adopt new Regulation 12, Rule 16: Petroleum Refining Facility-Wide Emissions Limits (Rule 12-16 or "Refining Caps Rule"). This rule would set numeric limits on specific refinery emissions. Rule 12-16 would apply only to the Bay Area's five petroleum refineries and three facilities associated with the refineries.

The staff of the Air District has developed a different approach that directly addresses concerns about health risks to communities exposed to air pollution. The staff recommendation is that the Air District adopt a new Regulation 11, Rule 18: Reduction of Risk from Air Toxic Emissions at Existing Facilities (Rule 11-18 or "Toxic Risk Reduction Rule"). Rule 11-18 would apply to all facilities in the Bay Area whose emissions of toxic air contaminants may result in a significant risk to nearby residents and workers, including petroleum refineries. The purpose of Rule 11-18 is to reduce the public's exposure to health risks associated with the emissions of toxic air contaminants (TACs) from stationary sources by reducing those risks to the lowest feasible levels.

Because the Board of Directors of the Air District intends to consider these rules within the same timeframe, staff is preparing one Environmental Impact Report (EIR) to cover both rules. The intent of the single EIR is to ensure that all of the potential environmental impacts for both rules are considered and comprehensively addressed. Although they are being considered at the same time, and both would affect refineries, the two rules are functionally independent. Adoption of one does not depend on adoption of the other. The Board of Directors could adopt either rule, both rules, or neither rule.

2.1.1 Rule 12-16 – Refinery Emissions Caps Rule

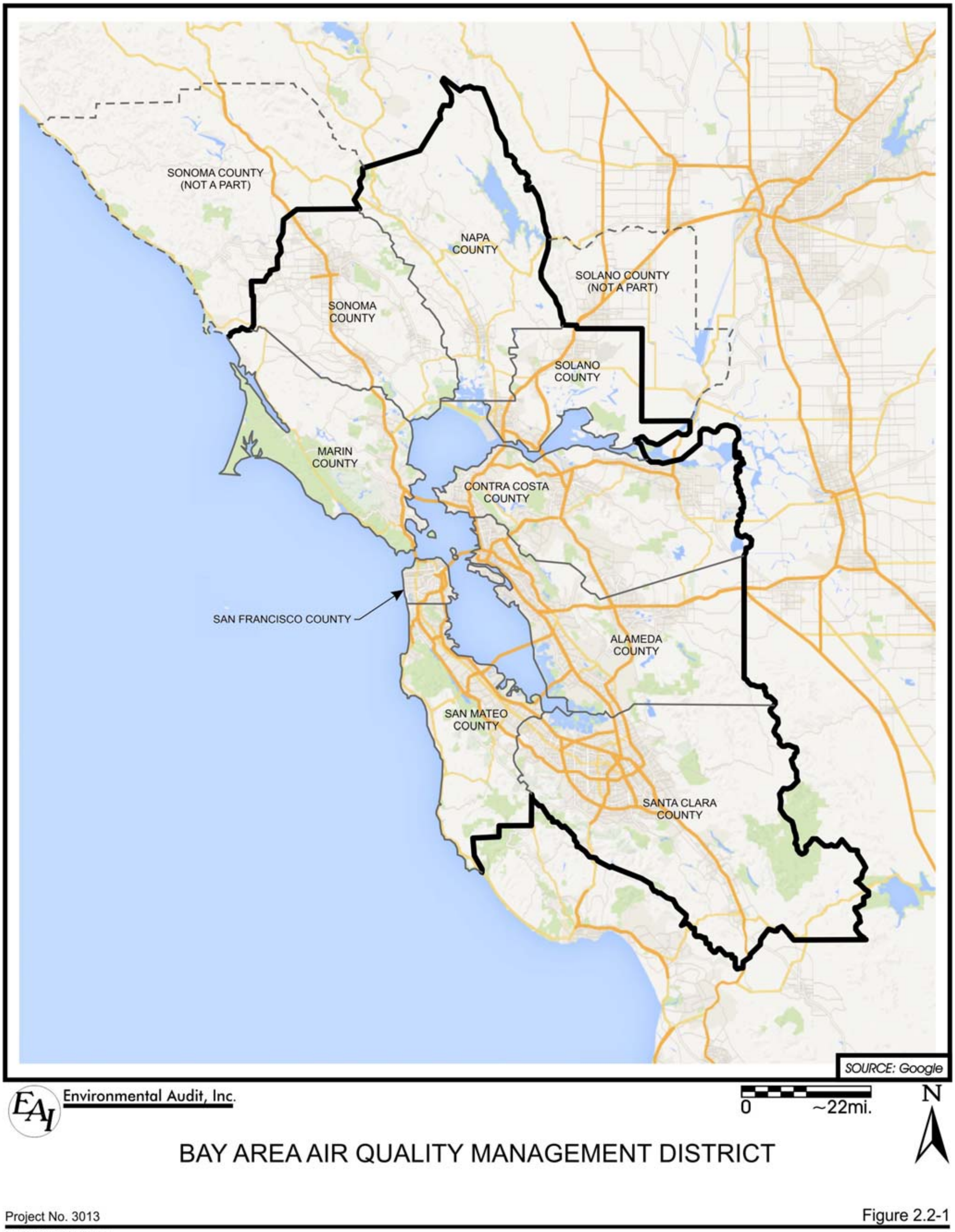
Rule 12-16 reflects a policy recommendation from CBE and their associated organizations (henceforth called "CBE"). The rule, as proposed by CBE, would limit the emissions of climate pollutants and three criteria pollutants: greenhouse gases (GHGs), particulate matter (PM), oxides of nitrogen (NOx), and sulfur dioxide (SO_2) from petroleum refineries and three associated facilities. The rule would establish facility-wide emissions limits for the covered pollutants at each of the affected facilities to ensure that each facility does not increase emissions due to changes in operation, crude or product slates; or increases in production. Each facility's emissions limits would be set at the maximum-annual emissions reported for that facility in the period from 2011 through 2015 with an additional allowance or "threshold factor" of seven percent over the maximum annual emission rate for each pollutant.

2.1.2 Rule 11-18 – Toxic Risk Reduction Rule

Rule 11-18, as drafted by Air District staff, would ensure that emissions of TACs from existing facilities do not pose an unacceptable health risk to people living and working nearby. The rule would use the most up-to-date assumptions about the risk of compounds and would require the facility to take action to reduce risk below a specified risk threshold if the facility exceeds the risk thresholds. If the facility could not devise a means to reduce the risk below the specified risk level, the facility would be required to install best available retrofit control technology for toxic pollutants (TBARCT) on every significant source of TAC emissions at the facility.

2.2 PROJECT LOCATION

The BAAQMD has jurisdiction of an area encompassing 5,600 square miles. The Air District includes all of Alameda, Contra Costa, Marin, San Francisco, San Mateo, Santa Clara, and Napa Counties, and portions of southwestern Solano and southern Sonoma counties. The San Francisco Bay Area is characterized by a large, shallow basin surrounded by coastal mountain ranges tapering into sheltered inland valleys. The combined climatic and topographic factors result in increased potential for the accumulation of air pollutants in the inland valleys and reduced potential for buildup of air pollutants along the coast. The Basin is bounded by the Pacific Ocean to the west and includes complex terrain consisting of coastal mountain ranges, inland valleys and bays (see Figure 2.2-1). Proposed Regulations 11-18 would affect stationary sources of TAC emissions, including five petroleum refineries, within the Bay Area. Proposed Rule 12-16 would affect the five Bay Area petroleum refineries and three associated facilities.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2.3 PROJECT OBJECTIVES

The objectives of Toxic Risk Reduction Rule (Reg. 11-18) are to:

- Reduce the public's exposure to health risks associated with the emissions of TACs from stationary sources;
- Incorporate the most up-to-date health risk methodologies and health values into the Air District's risk evaluation process for existing stationary sources of TACs;
- Ensure the facilities that impact the most sensitive and overburdened communities reduce their associated health risk in an efficient and expeditious manner;
- Provide the public opportunity to comment on the draft HRAs to provide transparency and clarity to the process; and
- Provide the public opportunity to comment on risk reduction plans as they are drafted by the affected facilities.

The objectives of the Refining Emission Caps Rule (Reg. 12-16) are to:

- Protect air quality, public health, and the climate from increases in annual facility-wide mass emissions of GHGs, PM, NOx, and sulfur oxides (SOx) caused by changes in refinery oil feed quality or quantity, refinery or support equipment or operation, or combinations of these causes, by preventing any significant increase in these emissions;
- Protect the climate and public health by preventing any significant increase in these emissions at refineries and associated facilities from increasing the emission intensity of the production of transportation fuels;
- Protect community and public health by preventing any significant increase in these emissions from worsening hazards for which HRA methods may not account, including but not limited to acute and chronic ambient PM, NOx, SOx, and PM exposure hazards;
- Complement other air quality, public health, and climate measures by discouraging investment in new refinery equipment that would lead to increased emissions of GHG, PM, NOx, or SOx from Bay Area refineries.

2.4 BACKGROUND AND PROJECT DESCRIPTION

2.4.1 BACKGROUND

Rule 12-16 would affect the five petroleum refineries currently located in the Bay Area within the jurisdiction of the Air District:

- Chevron Products Company (Richmond),
- Phillips 66 Company – San Francisco Refinery (Rodeo),
- Shell Martinez Refinery (Martinez),
- Tesoro Refining and Marketing Company (Martinez), and
- Valero Refining Company – California (Benicia).

The rule would also affect three refinery-related facilities:

- Air Liquide (Richmond),
- Air Products (Martinez), and
- Martinez Cogen LP (Martinez).

Rule 11-18 would affect hundreds of facilities that emit TACs. The Air District has determined that these toxic emissions need to be reduced in order to be more protective of public health. These facilities include data centers, petroleum refineries, a cement kiln, gasoline dispensing facilities, etc., and emit a variety of TACs that can adversely impact public health. TACs include compounds such as diesel particulate matter (DPM), benzene, polycyclic aromatic hydrocarbons (PAHs), and 1,3-butadiene.

The primary focus of CBE's concern has been petroleum refineries. 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).

Air pollutants are categorized based on their properties, and the programs under which they are regulated. Air pollutants include: (1) criteria pollutants, (2) toxic pollutants, and (3) climate pollutants (or GHGs). Additional categories of air contaminants include odorous compounds and visible emissions.

Criteria pollutants are emissions for which Ambient Air Quality Standards (AAQS) have been set and include: (1) carbon monoxide (CO), (2) nitrogen dioxide (NO_2) and NO_X, (3) PM in two size ranges – aerodynamic diameter of 10 micrometers or less (PM_{10}), and aerodynamic diameter of 2.5 micrometers or less ($PM_{2.5}$), (4) volatile organic compounds (VOC), and (5) sulfur dioxide (SO_2). Other compounds, specifically volatile organic compounds (VOC), can react in the atmosphere to form ozone and are often regulated along with criteria pollutants. These compounds can have both localized and regional impacts. All of these criteria pollutants are emitted by petroleum refineries, as well as numerous other stationary sources and mobile sources (automobiles, trucks, locomotive engines, marine vessels, construction equipment, etc.).

TACs are emissions for which AAQS have generally not been established, but may result in human health risks. The State list of TACs currently includes approximately 190 separate chemical compounds and groups of compounds. These compounds tend to have more localized impacts. There are many TACs potentially emitted from industrial sources, including refineries.

GHGs are emissions that include carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), and three groups of fluorinated compounds (i.e., hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and sulfur hexafluoride (SF_6)), and are the major anthropogenic GHGs. The impact of these compounds is global in nature and require a global reduction to result in a beneficial impact on the global climate. GHGs emitted from petroleum refineries include CO_2, CH_4 and N_2O.

The regulatory approaches for Rules 11-18 and 12-16 are summarized below and include the following basic elements.

2.4.1.1 Regulation 11, Rule 18

- The Air District would screen all facilities that report toxic emissions. From this screening, the Air District would determine each facility's prioritization score. The Air District would conduct health risk assessments (HRA) for facilities with a cancer risk prioritization score of 10 or greater or a non-cancer prioritization score of 1.0 or greater. The HRAs would incorporate the new Office of Environmental Health Hazard Assessment (OEHHA) protocols and health risk values adopted in March 2015, the Risk Management Guidelines adopted in July 2015 by the California Air Resources Board (CARB) and the California Air Pollution Control Officers Association (CAPCOA), as well as revised Air District HRA guidelines. The Air District would schedule the development of the HRAs according to prioritization score and then according to type of facility.

- Facilities that pose a cancer risk in excess of 10 per million or a chronic or acute hazard index in excess of 1.0 must either:
  - Reduce the facility cancer risk below 10 per million and reduce the chronic and acute hazard indices below 1.0; or
  - Install TBARCT on all significant sources of toxic emissions.

2.4.1.2 Regulation 12, Rule 16

- Rule 12-16 would apply to each of the Bay Area petroleum refineries and three support facilities;

- Rule 12-16 would establish facility-wide emissions limits for GHGs, $PM_{2.5}$ and PM_{10}, NOx, and SO_2 at each of the affected facilities based on the following method:
    - Each facility emissions limit would be set at the maximum-annual emissions reported for that facility in the period from 2011 through 2015, and
    - Include an additional allowance or “threshold factor” that would equal seven percent over the maximum for GHGs, $PM_{2.5}$ and PM_{10}, NOx, and SO_2.

- Emissions from start-ups, shut-downs, maintenance and malfunctions would be subject to the cap; and,

- Compliance with the emissions limits would be based on comparing the annual emissions inventory with the facility-wide emissions limit for each covered pollutant. Any annual emissions inventory that exceeds the established pollutant emissions limit for the affected facility would be a violation of the rule.

2.4.2 PROJECT DESCRIPTION

The description of Regulation 11, Rule 18 and Regulation 12, Rule 16 are provided below.

2.4.2.1 Regulation 11, Rule 18

The rule would require facilities that pose a site-wide health risk in excess of the risk action level threshold of ten per million cancer risk or 1.0 hazard index for both chronic and acute risk to reduce that risk below the threshold through the implementation of a risk reduction plan approved by the Air District or demonstrate that all significant sources of toxic emissions are controlled TBARCT; a significant source of toxic emission is one that poses a health risk of 1.0/M cancer or 0.2 hazard index. The rule would be implemented in four phases based on either a facility’s prioritization score or the toxic emissions source.

2.4.2.1.1 Administrative Procedures

The Toxic Risk Reduction Rule would utilize the annual toxic emissions inventories reported to the Air District by sources that emit toxic compounds. From the toxic emissions inventory data, Air District would conduct a site-specific Health Risk Screening Analysis (HRSA). The HRSA would assess the potential for adverse health effects from public exposure to routine and predictable emissions of TACs. Procedures used for completing HRSAs are based on guidelines adopted by CARB/CAPCOA. From these HRSAs, the Air District would determine each facility’s prioritization score. The facility prioritization score or the toxic emissions source type would be used to determine which phase a facility would be placed. In establishing the prioritization level for a facility, the Air District would consider:

- The amount of toxic pollutants emitted from the facility;
- The toxicity of these materials;
- The proximity of the facility to potential receptors; and
- Any other factors that the Air District deems to be important.

The rule would be implemented in four phases based on either a facility's prioritization score or the toxic emissions source type as illustrated in Table 2.4-1. (Prioritization scores for all potentially affected facilities are expected to be completed by the end of 2017).

TABLE 2.4-1

Implementation Phases

Phase	Criterion	HRAs	Risk Reduction Plans	Plan Implementation
1	Cancer PS[(1)] > 250 or Non-cancer PS > 2.5	2017 – 2018	2018 – 2019	2019 – 2022
2	Cancer PS > 10 or Non-cancer PS > 1.0	2019 – 2021	2021 – 2022	2022 – 2025
3	Diesel IC Engines	2021 – 2013	2023 – 2024	2024 – 2027
4	Retail Gas Stations	2023 - 2024	2024 -2025	2025 - 2028

(1) PS = prioritization score

The Air District would conduct HRAs for facilities in accordance with the OEHHA HRA Guidelines and the CARB/CAPCOA Risk Management Guidelines that were updated in 2015. These Guidelines were updated pursuant to the Children's Environmental Health Protection Act (Senate Bill 25), which required that OEHHA develop health risk assessment procedures that ensure infants and children are protected from the harmful effects of air pollution. Using the results of the HRAs, the Air District would determine whether a facility would be affected by Rule 11-18. The rule would affect facilities with health risk impacts that exceeded any of the risk action level thresholds of ten per million cancer risk or 1.0 hazard index for both chronic and acute risk. The Air District would notify facilities of their health risk score. A facility with a risk action level exceeding the threshold(s) would be required to reduce the risk below the threshold(s) by implementing a risk reduction plan within five years of plan approval, or demonstrate that all significant sources of toxic emissions are controlled by TBARCT within the same three-year period; a significant source of toxic emission is one that poses a health risk of 1.0 per million cancer or 0.2 hazard index.

2.4.2.1.2 Health Risk Assessments

The Air District uses a variety of tools to determine where air quality health impacts may be occurring in the Bay Area, to assess the relative magnitude of these health impacts compared to other locations, and to determine how to best focus Air District resources in order to reduce these health impacts. HRAs are one of the tools that can be used to assess the relative magnitude of health hazards. HRAs are designed to quantify the potential health impacts that people and communities may be experiencing due to specific sources or facilities or that may occur in the future due to proposed projects or proposed changes at a facility. An HRA consists of four basic steps: 1) hazard identification; 2) exposure assessment; 3) dose response assessment; and 4) risk characterization. The Air District conducts HRAs using standardized methodologies for each of these steps. The Air District HRAs would be prepared in accordance with the most recent guidelines adopted by OEHHA in March 2015.

Air District staff believes that new facility-wide HRAs should be performed including improved emission inventories, updated health effects values, and the most recent HRA methodologies. Rule 11-18 would require that the Air District conduct HRAs utilizing the most recent OEHHA HRA Guidelines along with more refined emissions inventories.

2.4.2.1.3 Pollutant Coverage

The Toxic Risk Reduction Rule would address TAC emissions from existing stationary sources. TAC emissions from new and modified sources are addressed under Air District Regulation 2, Rule 5. The California Health and Safety Codes §39655 defines a TAC as "an air pollutant which may cause or contribute to an increase in mortality or in serious illness, or which may pose a present or potential hazard to human health. A substance that is listed as a hazardous air pollutant pursuant to subsection (b) of §112 of the federal act (42 U.S.C. §7412(b)) is a toxic air contaminant." For the purposes of this rule, TACs consists of the substances listed in Air District Regulation 2, Rule 5: New Source Review of Toxic Air Contaminants (Table 2-5-1.)

Some of the key pollutants to be addressed under the Toxic Risk Reduction Rule include the following:

<u>Benzene:</u>

Benzene is carcinogenic and occurs throughout the Bay Area. Most of the benzene emitted in the Bay Area comes from motor vehicles, including evaporative leakage and unburned fuel exhaust. Stationary sources contribute 13 percent of the benzene statewide. The primary stationary sources of benzene emissions include gasoline stations, petroleum refining, electricity generation, and cement production.

<u>1,3 Butadiene:</u>

1,3-butadiene is another carcinogen that is generated by gasoline and biomass combustion. Motor vehicle exhaust and fires are the most common sources. It is also produced during petroleum refining, and it is used in rubber and plastics manufacturing.

Polycyclic aromatic hydrocarbons (PAHs):

PAHs are a set of hydrocarbons formed of multiple benzene rings. Several PAHs have been shown to be carcinogenic, the best-studied of which is benzo(a)pyrene. Although PAHs are emitted during petroleum refining, in the Bay Area the vast majority derive from fossil fuel and wood combustion.

Diesel Particulate Matter (DPM):

DPM is the primary source of ambient risk based on risk analysis, followed by benzene and 1,3-butadiene. DPM emissions sources mainly include mobile sources, such as heavy-duty trucks, buses, construction equipment, locomotives, and ships, but also stationary sources such as stationary diesel engines and backup generators.

2.4.2.1.4 Source Coverage

The Toxic Risk Reduction Rule would apply to all sources of TAC emissions from "stationary sources" in the Bay Area. Stationary sources, as opposed to mobile sources such as trucks and other vehicles, are the sources over which the Air District has regulatory jurisdiction.

The Toxic Risk Reduction Rule would apply to a wide variety of sources and facilities located throughout the Bay Area, including data centers, petroleum refineries, chemical plants, wastewater treatment facilities, foundries, forges, landfill operations, hospitals, crematoria, gasoline dispensing facilities (i.e., gasoline stations), colleges and universities, military facilities and installations and airline operations. The Air District estimates that hundreds of facilities could be impacted by this rule.

2.4.2.2 Regulation 12, Rule 16

2.4.2.2.1 Pollutant Coverage

The Refining Cap Rule would limit the emissions of climate pollutants (GHGs) and three criteria pollutants (PM – both PM_{10} and $PM_{2.5}$, NOx, and SO_2) from refineries and other refining related facilities to a specific baseline plus an allowance; thereby establishing a "cap" for each of these emissions that the facility could not exceed.

Greenhouse Gases:

GHGs refer to gases that contribute to anthropogenic climate change (i.e., global warming). In addition to negative impacts on air quality as higher temperatures contribute to increased levels of ozone and PM, climate change may cause a wide range of ecological, social, economic, and demographic impacts. GHGs include carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), and three groups of fluorinated compounds (i.e., hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and sulfur hexafluoride (SF_6)). CO_2 is released to the atmosphere when fossil fuels (oil, gasoline, diesel, natural gas, and coal), solid waste, and wood or wood products are burned. CH_4 is emitted during the production and transport of coal, natural gas, and oil. CH_4 emissions also result from the decomposition of organic waste in municipal solid waste landfills and the raising of livestock. N_2O is emitted during agricultural and industrial activities, as well as during combustion of solid waste and fossil fuels. Fluorinated hydrocarbons: HFCs, PFCs, and SF_6, are generated in a variety of industrial processes. Although these gases are small in terms of their absolute mass, they are potent agents of climate change as expressed by their global warming potential.

Particulate Matter:

PM is a complex pollutant composed of an assortment of tiny airborne particles that vary in size and mass (ultrafine, fine, and coarse), physical state (solid or liquid), chemical composition, toxicity, and how they behave in the atmosphere. These particles originate from a variety of man-made and natural sources, including fossil fuel combustion, residential wood burning and cooking, wildfires, volcanoes, sea salt, and dust. Fine and ultrafine particles are so small, they can bypass the body's natural defenses and penetrate deep into the lungs, bloodstream, brain and other vital organs, and individual cells. Health studies have shown that exposure to PM can have a wide range of negative health effects, including triggering asthma attacks, chronic bronchitis, impaired lung development in children, heart attack, stroke, and premature death. Residential wood burning is the largest source of PM in the Bay Area during winter days. On an annual basis, mobile sources such as cars, trucks, ships and trains are the largest source of PM in the Bay Area.

Nitrogen Oxides:

Nitrogen oxides are a group of gases that form when nitrogen reacts with oxygen during combustion, especially at high temperatures. These compounds (including nitric oxide and nitrogen dioxide), can contribute significantly to air pollution, especially in cities and areas with high motor vehicle traffic. In the Bay Area, nitrogen dioxide appears as a brown haze. At higher concentrations, nitrogen dioxide can damage sensitive crops, such as beans and tomatoes, and aggravate respiratory problems.

Sulfur Oxides:

Heating and burning fossil fuels (such as coal and oil) release the sulfur present in these materials. In areas where large quantities of fossil fuels are used, sulfur oxides can be a major air pollution problem. The most common kind of sulfur oxide is SO_2. This substance can react with oxygen to form sulfur trioxide, which can form sulfuric acid mist in the presence of moisture. These contaminants can damage vegetation and negatively impact the health of both humans and animals.

2.4.2.2.2 Affected Facilities

The Refining Caps Rule would apply to each of the Bay Area's five petroleum refineries and to three additional support facilities. The five refineries are Chevron Refinery in Richmond, Shell Refinery in Martinez, Phillips 66 Refinery in Rodeo, Tesoro Refinery in Martinez, and Valero Refinery in Benicia. The three affected support facilities are Air Liquide in Richmond, Air Products in Martinez, and Martinez Cogen LP in Martinez.

2.4.2.2.3 Emissions Limits

The draft emissions limit for each covered pollutant and each affected facility are shown in Table 2.4-2. A numeric limit on the annual mass emission rate of each air pollutant specified would be applied to each facility specified in the table. The limit is equal to the maximum-year actual emissions reported in 2011–2015 plus the additional allowance, or threshold factor, of seven percent that is intended to account for normal year-to-year variations in emissions.

2.4.2.2.4 Changes in Monitoring Methods

CBE intends that these limits would change if the quantity of reported emissions changed solely due to a change in the method of monitoring or estimating emissions. Air District staff will work with CBE to capture this intent either in the rule language or in the plan for implementing the rule.

TABLE 2.4-2

Enforceable Emissions Limits on Refinery-Wide Emissions[(a)]

Facility		Pollutants				
Name	**Facility ID Number**	**GHG[(b)]** (thousands of metric tons)	**$PM_{2.5}$[(c)]** (tons)	**PM_{10}[(c)]** (tons)	**NOx[(c)]** (tons)	**SO_2[(c)]** (tons)
Chevron	A-0010	4,774	502	526	971	394
Shell	A-0011	4,560	495	589	1,068	1,455
Phillips 66	A-0016	1,608	75	83	334	443
Tesoro	B-2758/B-2759	2,615	77.7	97	1,015	644
Valero	B-2626/B-3193	3,145	133	133	1,300	69.6
Martinez Cogen LP	A-1820	451	18.8	18.8	119	2.3
Air Liquide	B-7419	947	16.1	17.3	13.8	2.5
Air Products	B-0295	290	9.7	10.4	3.4	2.3

(a) Annual facility-wide emission limits.
(b) GHG: greenhouse gas emissions (CO_2e) as reported under CARB's Mandatory Reporting requirements.
(c) $PM_{2.5}$ = "fine" particulate matter, PM_{10} = "respirable" particulate matter, NOx = oxides of nitrogen, SO_2 = sulfur dioxide as reported in the facility's annual emission inventory.

2.5 SOURCES AFFECTED BY REGULATIONS 11-18 AND 12-6 AND APPLICABLE CONTROL TECHNOLOGIES

Rule 11-18: As indicated in the project description above, to comply with Rule 11-18 existing affected facilities that pose a health risk in excess of the risk action level threshold of ten per million cancer risk or 1.0 hazard index for both chronic and acute non-cancer risk must reduce that risk below the threshold through the implementation of a risk reduction plan approved by the Air District. To comply with the risk reduction plan requirements, facility operators could reduce operations or, to maintain existing operations, change the nature of the toxic emissions either through modification of stack emission parameters or through toxic emission reductions, or install air pollution control equipment that meets TBARCT requirements.

Rule 12-16: Rule 12-16 would establish facility-wide annual emissions limits for GHGs, $PM_{2.5}$ and PM_{10}, NOx, and SO_2 at each of the five Bay Area refineries and three refinery-related facilities (see Table 2.4-2). Any affected facility that exceeds any applicable annual emissions limits would be in violation of the draft rule. To comply with the annual facility-wide emission limits, operators of affected facilities could also reduce operations or install air pollution control technologies consistent with BARCT.

Discussion: Under both rules' adoption scenarios, the NOP/IS for the proposed project identified potentially significant adverse secondary environmental impacts resulting primarily from installing air pollution control technologies. Therefore, the analysis of potentially significant environmental impacts in Chapter 3 is based on secondary impacts from installing air pollution control equipment. To analyze environmental impacts from either or both draft rules, it is necessary to identify the emission sources that would be subject to each rule's requirements and the most likely types of control technologies anticipated to be used to ensure compliance with each rule.

It is not specifically known what types of equipment would be affected by either rule. However, based on the Air District's emissions inventory database, TAC and criteria pollutant emissions from sources likely to be affected by either rule can be identified. The emission sources most likely to be affected by draft Rules 11-18 and 12-16 are identified and briefly described in the following sections.

2.5.1 Sources that May Be Subject to Regulation 11, Rule 18

Draft Rule 11-18 would apply to a wide range of commercial, industrial, and municipal facilities including data centers, petroleum refineries, chemical plants, wastewater treatment facilities, foundries, forges, landfill operations, hospitals, crematoria, gasoline dispensing facilities (i.e., gasoline stations), power plants, colleges and universities, military facilities and installations, and airline operations. Table 2.5-1 shows the most likely types of facilities anticipated to be affected by draft Rule 11-18, TAC emission sources at affected facilities most likely to be affected by the draft rule and the primary TAC emissions that would be controlled.

Table 2.5-1
Summary of Toxic Air Contaminant Emitting Facilities and Sources

Facility	Sources	Primary Risk Driver(s)
Refineries	Fugitive Emissions Stack Emissions Diesel Engines Cooling Towers Wastewater Treatment Operations	Benzene Diesel PM Formaldehyde 1,3-Butadiene Chromium VI Nickel
Data Centers	Stationary Diesel Engines	Diesel PM
Cement Manufacturing	Stack Emissions Fugitive Emissions	Chromium VI
Chemical Plants	Stack Emissions Fugitive Emissions	Formaldehyde Carbon Tetrachloride Sulfuric Acid Mist Diesel PM
Crematoria	Stack Emissions	Chromium VI Mercury
Landfills	Fugitive Emissions Diesel Engines Energy Plants	Vinyl Chloride Hydrogen Sulfide Benzene Acrylonitrile Diesel PM Formaldehyde
Foundries	Fugitive Emissions	Dioxin Manganese Lead Chromium VI Mercury Cadmium Nickel Arsenic PAHs Copper
Sewage Treatment Facilities	Fugitive Emission Stack Emissions	Diesel PM Hydrogen Sulfide Cadmium Mercury
Power Plants	Stack Emissions	Formaldehyde Ammonia Benzene Diesel PM
Gasoline Stations	Fugitive Emissions	Benzene Ethyl Benzene
Military Facilities	Diesel Engines	Diesel PM
Manufacturing	Diesel Engines	Diesel PM

Facilities affected by draft Rule 11-18 operate a wide variety of sources of toxic emissions, including diesel-fueled internal combustion engines, wastewater treatment, combustion sources, evaporative and fugitive emissions, etc. The Air District estimates that hundreds of facilities could potentially be affected by this draft rule. The following subsections briefly describe the most likely facilities and emissions sources affected by Draft Rule 11-18.

2.5.1.1 Refineries

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 with respect to its composition, thus, potentially generating different types and amounts of TAC emissions.

<u>Fugitive Emissions Sources:</u> Petroleum refineries include a large number and wide variety of fugitive emissions sources. Fugitive emissions are emissions of gases or vapors from pressurized equipment due to leaks and other unintended or irregular releases of gases during the crude refining process and do not include pollutants vented to an exhaust stack before release to the atmosphere. Generally, any processes or transfer areas where leaks can occur are sources of fugitive emissions. Fugitive emissions sources include, but are not limited to the following: valves, connectors (i.e., flanged, screwed, welded or other joined fittings), pumps, compressors, pressure relief devices, and diaphragms in VOC service. Similarly, tanks storing crude oil or petroleum products also produce fugitive emissions. The primary TAC associated with fugitive emissions sources is benzene.

<u>Stack Emissions:</u> There are two primary sources of TAC emissions from exhaust stacks at petroleum refineries, delayed coking units (DCUs) and petroleum coke calciners (PCCs). These equipment and processes are briefly described in the following paragraphs.

Delayed Coking: Delayed coking is a petroleum refinery process that converts mostly heavy residual oils, also known as residuum or “resid” for short, from vacuum distillation towers into gasoline, light gas oil and heavy gas oil. Petroleum coke is a by-product of the coking process. The resid is fed into a fractionation tower and the bottom fraction (e.g., the heavy components of the resid), is passed through a heater as it makes its way to a coke drum under steam injection. The purpose of the steam injection is to delay coking or the solidification of the hot material until it reaches the drum, hence the name “delayed coker.” When heated to high temperatures, the heavy hydrocarbon chains break into smaller, lighter molecules that rise to the top of the coke drum as vapors that are routed back to the fractionation tower for more separation into gas, gasoline, and other higher value liquid products. Even after heating, the heavier components remain in the coke drum. Within approximately 30 minutes to one hour, the material left behind in the drum turns into, petroleum coke, a coal-like substance. At the end of the coking process, the drum is then vented to the atmosphere until the internal pressure of the drum equals ambient pressure. TAC emissions from the DCU primarily include heavy metals.

At the federal level, in 2008, the USEPA promulgated a regulation in Chapter 40, Part 60, Subpart Ja of the Code of Federal Regulations (40 CFR 60 Subpart Ja) - Standards of Performance for Petroleum Refineries for Which Construction, Reconstruction or Modification Commenced after May 14, 2007, specifically applicable to DCU operations that establishes a vent limit of five pounds per square inch, gauge (psig) for coke drums at new or modified DCUs. By depressurizing the coke drum beyond the federal requirement, to two psig for example, for both new and existing DCUs $PM_{2.5}$, and sulfur as H_2S emission reductions can be achieved with the co-benefit of additional VOC and GHG (methane) emission reductions.

Petroleum Coke Calciner: Petroleum coke is processed in a delayed coker unit (described above) to generate a carbonaceous solid referred to as "green coke," a commodity. To improve the quality of the product, if the green coke has a low metals content, it will be sent to a calciner to make calcined petroleum coke. Calcined petroleum coke can be used to make anodes for the aluminum, steel, and titanium smelting industry. If the green coke has a high metals content, it is used as a fuel grade coke by the fuel, cement, steel, calciner and specialty chemicals industries.

The process of making calcined petroleum coke begins when the green coke feed from the delayed coker unit is screened and transported to the calciner unit where it is stored in a covered coke storage barn. The screened and dried green coke is introduced into the top end of a rotary kiln and is tumbled by rotation under high temperatures that range between 2,000 and 2,500 degrees Fahrenheit (^{o}F). The rotary kiln relies on gravity to move coke through the kiln countercurrent to a hot stream of combustion air produced by the combustion of natural gas or fuel oil. As the green coke flows to the bottom of the kiln, it rests in the kiln for approximately one additional hour to eliminate any remaining moisture, impurities, and hydrocarbons. Once discharged from the kiln, the calcined coke is dropped into a cooling chamber, where it is quenched with water, treated with de-dusting agents to minimize dust, and carried by conveyors to storage tanks. TAC emissions generated when the green coke is processed under high heat conditions in the rotary kiln are primarily heavy metals.

<u>Stationary Diesel Internal Combustion Engines (ICEs):</u> Stationary diesel ICEs are often used to provide electricity in areas of a refinery that may not have access to electricity power lines from the local electric utility or other onsite sources of electricity, used as a backup source of electricity in the event of a power outage, or as a means of pumping liquids between different refinery equipment. Four-stroke cycle ICEs are more commonly used than two-stroke ICEs. Stationary diesel ICEs operate by drawing air into a cylinder and then injecting fuel after the air has been compressed. Stationary diesel ICEs rely on high temperature alone for ignition. Stationary diesel ICEs are often referred to as compression ignition engines because the high temperature is the result of compressing air above the piston as it travels upward. The power output of a diesel ICE is controlled by varying the amount of fuel injected into the air, thereby, varying the fuel-air ratio. The

main advantage of using a diesel engine is its high thermal efficiency[1], which can exceed 50 percent. However, diesel ICE exhaust tends to be high in NOx and particulate emissions, both visible (smoke) and invisible. Diesel particulates were also classified as a TAC by CARB in in 1998.

Cooling Towers: A cooling tower is a heat rejection device, which extracts waste heat from various processes to the atmosphere though the cooling of a water stream to a lower temperature. Cooling towers are open water recirculating devices that use fans or natural draft to draw or force air through the device to cool water by evaporation and direct contact. The type of heat rejection in a cooling tower is termed "evaporative" in that it allows a small portion of the water being cooled to evaporate into a moving air stream to provide significant cooling to the rest of that water stream. The heat from the water stream transferred to the air stream raises the air's temperature and its relative humidity to 100 percent and this air is discharged to the atmosphere. TAC emissions from cooling towers can include fugitive VOCs leaked into the cooling water, which may include benzene and 1,3-butadiene and other toxic VOCs.

Wastewater Treatment Operations: Wastewater treatment operations provide a means of treating water that has come into contact with petroleum hydrocarbons. The first stage of a typical wastewater treatment process is the American Institute of Petroleum (API) separator, which physically separates the free oil and solids from the water. Gravity allows any oil in the water to rise to the surface of the separator and any solid particles to sink to the bottom. A continually moving scraper system pushes oil to one end and the solids to the other. Both are removed and the recovered oil is sent back to the Refinery for reprocessing. Small suspended oil particles are then typically removed in the Dissolved Air Flotation unit. Wastewater is sent to the activated sludge units, where naturally-occurring microorganisms feed on the dissolved organics in the wastewater, and convert them to water, CO_2 and nitrogen gas, which can be safely released into the atmosphere. Finally, wastewater enters the clarifying tanks, where the microorganisms settle to the bottom while the treated wastewater flows away. The primary TAC emission from wastewater treatment systems is benzene.

2.5.1.2 Data Centers

A data center is a facility used to house computer systems and associated components, such as telecommunications and data storage systems. It generally includes redundant or backup power supplies, redundant data communications connections, environmental controls (e.g., air conditioning, fire suppression) and various security devices.

Stationary Diesel ICEs: Because a power outage can badly damage computer telecommunications and storage systems, backup power supplies are essential. Backup

[1] Thermal efficiency is defined as the amount of work produced by the engine divided by the amount of chemical energy in the fuel that can be released through combustion. This chemical energy is often referred to as net heating value or heat of combustion of the fuel.

power supplies may include backup stationary diesel ICEs to provide electricity. See discussion 2.5.1.1 regarding stationary diesel ICEs and TAC emissions.

2.5.1.3 Cement Manufacturing

Cement manufactured in a cement kiln using a pyroprocess or high temperature reactor that is constructed along a longitudinal axis with segmented rotating cylinders whose connected length is anywhere from 50 to 200 yards in length. The pyroprocess in the kiln consists of three phases during which clinker is produced from raw materials undergoing physical changes and chemical reactions. The first phase in the kiln, the drying and pre-heating zone, operates at a temperature between 1,000 ºF and 1,600 ºF and evaporates any remaining water in the raw mix of materials entering the kiln. The second phase, the calcining zone, operates at a temperature between 1,600 ºF and 1,800 ºF and converts the calcium carbonate from the limestone in the kiln feed into calcium oxide and releases CO_2. During the third phase, the burning zone operates on average at 2,200 ºF to 2,700 ºF (though the flame temperature can at times exceed 3,400 ºF) during which several reactions and side reactions occur. As the materials move towards the discharge end, the temperature drops and eventually clinker nodules form and volatile constituents, such as sodium, potassium, chlorides, and sulfates, evaporate. The red-hot clinker exits the kiln, is cooled in the clinker cooler, passes through a crusher and is conveyed to storage.

<u>Stack emissions:</u> As indicated above cement manufacturing occurs at high temperatures using several combustion fuels. Fuels that have been used for primary firing include coal, petroleum coke, heavy fuel oil, natural gas, landfill off-gas and oil refinery flare gas. High carbon fuels such as coal are preferred for kiln firing, because they yield a luminous flame. The clinker is brought to its peak temperature mainly by radiant heat transfer, and a bright (i.e. high emissivity) and hot flame is essential for this. Combustion emissions are exhausted through the kiln's stack. The primary TAC emission from cement manufacturing is hexavalent chromium, also referred to as chromium VI.

<u>Fugitive Dust:</u> Relative to cement manufacturing, fugitive dust is wind-driven particulate matter emissions from any disturbed surface work area that are generated by wind action alone. The process of making cement begins with the acquisition of raw materials, predominantly limestone rock (calcium carbonate) and clay, which exist naturally in rocks and sediment on the earth's surface. These and other materials used to manufacture cement are typically mined at nearby quarries and comprise "raw mix." The raw mix is refined by a series of mechanical crushing and grinding operations to segregate and eventually reduce the size of each component to 0.75 inch or smaller before being conveyed to storage. If the ground materials are stored in piles onsite, local windy conditions may produce fugitive hexavalent chromium emissions.

2.5.1.4 Chemical Plants

A chemical plant is any industrial facility engaged in producing chemicals, and/or manufacturing products by chemical processes. The general objective of a chemical plant is to create new material wealth via the chemical or biological transformation and or separation of materials. Chemical plants often use specialized equipment, units, and/or technology used in the manufacturing process. Chemical plants may include, but are not limited to the manufacture of industrial inorganic and organic chemicals; plastic and synthetic resins, synthetic rubber, synthetic fibers; drugs; soap, detergents and cleaning preparations, perfumes, cosmetics and other toilet preparations; paints, varnishes, lacquers, enamels and allied products; agricultural chemicals; safflower and sunflower oil extracts; and re-refining. The primary types of equipment used at chemical plants include, but are not limited to: crushers, mixing tanks, compactors, heaters, etc.

Stack emissions: Mixing equipment that combines chemicals to produce inorganic and organic chemicals; plastic and synthetic resins, synthetic rubber, synthetic and other man-made fibers, etc., may be vented to an exhaust stack. Emissions from chemical plants may include: formaldehyde (used as a raw material in resin, plastic, leather, paper and fiber manufacturing); carbon tetrachloride (used as a cleaner), and sulfuric acid (from sulfur recovery plants).

Fugitive Emissions: Fugitive emissions at chemical plants include particulate emissions from chemical handling and uncontrolled product crushing or compressing and emissions that are released through windows, doors, vents, and other general building ventilation or exhaust systems.

2.5.1.5 Crematoria

Cremation is the combustion, vaporization and oxidation of cadavers to gases, ashes and mineral fragments retaining the appearance of dry bone. Cremation occurs in a crematory that is housed within a crematorium and comprises one or more furnaces. A cremator is an industrial furnace that is able to generate temperatures of 1,600 ºF to 1,800 °F to ensure disintegration of the corpse. The chamber where the body is placed is called a retort and is lined with heat-resistant refractory bricks. Refractory bricks are designed in several layers. The outermost layer is usually simply an insulation material, e.g., mineral wool. Inside is typically a layer of insulation brick, mostly calcium silicate in nature. Modern crematoria fuels may include oil, natural gas, and propane.

Stack Emissions: Combustion emissions from the furnace are vented to an exhaust stack and then may be released to the atmosphere. Mercury from dental amalgam fillings can be emitted through the exhaust stack during the cremation process. Metals, such as chromium VI, arsenic and cadmium, are also found in crematory exhaust.

2.5.1.6 Landfills

Landfills, also called sanitary landfills, are locations where non-hazardous waste is deposited, spread in layers, compacted, and covered with earth at the end of each working day. Modern landfills typically include a bottom liner that separates and prevents the buried waste from coming into contact with underlying natural soils and groundwater. The bottom of each landfill is typically designed so that the bottom surface of the landfill is sloped to a low point, called a sump. This is where any liquids that are trapped inside the landfill – known in the waste industry as leachate – are collected and removed from the landfill. The leachate collection system typically consists of a series of perforated pipes, gravel packs and a layer of sand or gravel placed in the bottom of the landfill. Landfill cells are the area in a landfill that have been constructed and approved for disposal of waste each day. Waste material is prepared by placing it in layers or lifts where the waste is then compacted and shredded by heavy landfill compaction machinery. Waste that is placed in a cell is covered daily with either six inches of compacted soil or an alternative daily cover, such as foam or a flame-retardant fiber material.

Fugitive Emissions: Bacteria in the landfill waste break down the trash in the absence of oxygen. This process produces landfill gas, which is approximately 50 percent methane. Landfill gas is collected in a series of pipes that are embedded within the landfill waste materials. This gas, once collected, is typically control-burned. Fugitive landfill TAC emissions may include vinyl chloride, benzene, hydrogen sulfide, and acrylonitrile.

Stationary Diesel ICEs: Because landfills are often located in remote areas away from population centers, they might not be served by electricity power lines from the local electric utility. Stationary diesel ICEs are often used to provide electricity to landfills that may not have access to electricity sources. If electricity is available, they may be used as a backup source of electricity in the event of a power outage. Finally, diesel ICEs may be used to pump liquids, such as leachate, to storage or treatment facilities. See discussion 2.5.1.1 regarding stationary diesel ICEs and TAC emissions.

2.5.1.7 Foundries

Foundries are industrial operations that create metal products by heat treating and shaping metals. Forging operations include operation of an oven in which metal is heated until it is malleable; it may then undergo hardening, annealing, tempering stamping, pressing, extruding, hammering, and quenching. Foundries operate using a furnace in which scrap metal, ingots, and/or other forms of metal are charged, melted, and tapped. Metals are melted using a furnace. Types of furnaces include, but are not limited to, cupola, electric arc, pot, induction, blast, crucible, sweat, and reverberatory furnaces. Once a cast metal part has been shaken out and cooled, it undergoes the finishing operations, which address imperfections and assembly in preparation of the final product for the customer. Finishing operations includes shot blasting, grinding, and welding.

Fugitive Emissions: Fugitive emissions at foundries include mold vent gases, equipment leaks, particulate emissions from metal handling and uncontrolled product finishing, and emissions that are released through windows, doors, vents, and other general building ventilation or exhaust systems. TAC emissions from foundries may include dioxins, PAHs, and heavy metals.

2.5.1.8 Sewage Treatment Facilities

Sewage treatment is the process of removing contaminants from wastewater, primarily from household sewage. The process includes physical, chemical, and biological processes to remove these contaminants and produce environmentally safe treated wastewater (or treated effluent). A by-product of sewage treatment is usually a semi-solid waste or slurry, called sewage sludge, that may be required to undergo further treatment before being suitable for disposal or land application.

The following bullet points provide brief summaries of the main steps in treating wastewater (Wikipedia, 2017).

- *Pretreatment:* Pretreatment is a process that removes all materials that can be easily collected from the raw sewage before they damage or clog the pumps and sewage lines of primary treatment clarifiers. During pretreatment, the influent in sewage water passes through a bar screen to remove all large objects carried in the sewage stream, including, but not limited to: trash, tree limbs, leaves, branches, cans, rags, sticks, plastic packets, etc. This process is most commonly done with an automated mechanically raked bar screen in modern plants serving large populations, while in smaller or less modern plants, a manually cleaned screen may be used.
- *Primary Treatment:* Primary treatment consists of temporarily holding the sewage in a quiescent basin where heavy solids can settle to the bottom while oil, grease, and lighter solids float to the surface. The settled and floating materials are removed and the remaining liquid may be discharged or subjected to secondary treatment. In the primary sedimentation stage, sewage flows through large tanks, commonly called "pre-settling basins," "primary sedimentation tanks," or "primary clarifiers." The tanks are used to settle sludge while grease and oils rise to the surface and are skimmed off. Primary settling tanks are usually equipped with mechanically driven scrapers that continually drive the collected sludge towards a hopper in the base of the tank where it is pumped to sludge treatment facilities.
- *Secondary Treatment:* Secondary treatment removes dissolved and suspended biological matter. The majority of municipal plants treat the settled sewage liquor using aerobic biological processes. To be effective, the bacteria and protozoa require both oxygen and food to live. These micro-organisms consume biodegradable soluble organic contaminants (e.g. sugars, fats, organic short-chain carbon molecules, etc.) and bind much of the less soluble fractions into floc. Secondary treatment systems are classified as fixed film or suspended-film growth systems. Fixed-film or attached growth systems include, but are not limited to: trickling filters, bio-towers, and rotating biological contactors where the biomass grows on media and the sewage passes over its surface. Suspended-growth systems include activated sludge, where the biomass is mixed with the sewage and can be operated in a smaller space than trickling filters that treat the same amount of water. Secondary treatment may require a separation process to remove the micro-organisms from the treated water prior to discharge or tertiary treatment.

- *Tertiary Treatment:* Tertiary treatment is sometimes defined as anything more than primary and secondary treatment to allow release into a sensitive or fragile ecosystem (estuaries, low-flow rivers, etc.). Treated water is sometimes disinfected chemically or physically (for example, by lagoons and microfiltration) prior to discharge into a stream, river, bay, lagoon or wetland. If it is sufficiently clean, it can also be used for groundwater recharge or agricultural purposes.

Fugitive Emissions: Wastewater treatment units open to the atmosphere have the potential to generate fugitive emissions. For example, the equalization basin, one of the first parts of the wastewater treatment process, regulates the wastewater flow and pollutant compositions to the remaining treatment units. The equalization basin also typically provides a large area for wastewater contact with ambient air. For this reason, fugitive emissions may be relatively high from this unit. Wastewater then is typically sent to the clarifier using a lift station, which may also be open to the ambient air. Suspended solids are removed in the clarifier and the wastewater then flows, again using a lift station, to the aeration basin where microorganisms act on the organic constituents. The lift station, clarifier, and aeration basin may be open to the atmosphere. Wastewater leaving the aeration basin normally flows through a secondary clarifier for solids removal before it is discharged from the facility (STAPPA/ALAPCO, 1997). The secondary clarifier is also likely to be open to the atmosphere. Fugitive TAC emissions from wastewater treatment include hydrogen sulfide and toxic organic compounds.

Stack Emissions: Sludge that is separated from the wastewater is sent to the sludge digesters. Sludge digesters are used to treat organic sludges produced from various treatment operations. The two main types of sludge digesters are anaerobic and aerobic. Anaerobic digesters aerate the sludge for an extended period of time in an open, unheated tank using conventional air diffusers or surface aeration equipment. In aerobic digestion, the sludge is aerated for an extended period of time in an open, unheated tank using conventional air diffusers or surface aeration equipment. The digestion process may produce a variety of emissions, including methane, which may be sent to an air pollution control unit or combusted. Energy recovery units, which are often used to control methane, produce formaldehyde and benzene during combustion of digester gas and natural gas. The sludge is then dewatered using a dryer. Stack emissions may occur from the combustion of digester gas or from the dryer. TAC emissions from wastewater treatment systems' exhaust stacks include hydrogen sulfide.

Incineration of sludge tends to maximize heavy metal concentrations in the remaining solid ash requiring disposal; but the option of returning wet scrubber effluent to the sewage treatment process may reduce air emissions by increasing concentrations of dissolved salts in sewage treatment plant effluent. Risk due to metal emissions can be mitigated using wet scrubbers or afterburning and increasing stack heights.

2.5.1.9 Power Plants

Power plants, also referred to as generating stations or generating plants, are industrial facilities for the generation of electric power. Most power plants contain one or more pieces of equipment used to generate electrical power. The most common equipment used to generate electricity at power plants are gas turbines and/or boilers.

A gas turbine is an internal-combustion engine consisting of at least a compressor, a combustion chamber, and a turbine. The compressor draws air into the engine, pressurizes it, and feeds it to the combustion chamber. The combustion system is typically made up of a ring of fuel injectors that inject a steady stream of fuel into combustion chambers where it mixes with the air. The combustion produces a high temperature, producing a high-pressure gas stream that enters and expands through the turbine section. The turbine is an intricate array of alternate stationary and rotating aerofoil-section blades. As hot combustion gas expands through the turbine, it spins the rotating blades. The rotating blades perform a dual function: they drive the compressor to draw more pressurized air into the combustion section, and they spin a generator to produce electricity (U.S. Dept., of Energy).

A boiler is a piece of combustion equipment fired with liquid and/or gaseous fuel, which is primarily used to produce steam. Boilers used to generate electricity are generally less efficient than gas turbines. All boiler designs share a number of common elements. Utility boilers are typically watertube boilers where combustion takes place in an enclosed furnace and heat is transferred from the furnace to water in tubes. In the furnace itself, heat is transferred by radiation from the combustion gases to tubes lining the walls. As gases cool and leave the furnace, the primary heat transfer mechanism becomes convection. A boiler is designed to have specific fixed temperature zones for optimum heat transfer to the watertubes; modification of these designs will affect boiler efficiency. For utility boilers, various types of burners are used to combust the fuel (STAPPA/ALAPCO, 1994).

Stack Emissions: In the case of both gas turbines and boilers, combustion emissions are vented to an exhaust stack and then released to the atmosphere. However, before the exhaust is released to the atmosphere, it is vented to a NOx emission control device to reduce NOx emissions pursuant to Rule 9-9 for gas turbines and Rule 9-10 for power generating boilers. Depending on the combustion fuel used, gas turbines and utility boilers have the potential to emit formaldehyde and benzene if they are not completely combusted in the boiler or gas turbine. In the event of an emergency, Rules 9-9 and 9-11 allow the use of non-gaseous fuels for gas turbines and electric utility boilers, respectively, which has the potential to produce diesel PM emissions. NOx control using selective catalytic reduction (SCR) uses a reducing agent, typically ammonia, to reduce NOx to nitrogen and water. Not all of the ammonia reacts with the NOx molecules and so is vented to the atmosphere, referred to as ammonia slip.

2.5.1.10 Gasoline Stations

Gasoline stations include any stationary operation that dispenses gasoline directly into the fuel tanks of motor vehicles. Gasoline stations are treated as a single source which includes all necessary equipment for the exclusive use of the facility, such as pumps, pump nozzles, dispensers, vapor return lines, plumbing and storage tanks. VOC emissions from gasoline stations are regulated by Rule 8-7.

Fugitive Emissions: Fugitive emissions at gasoline stations may occur when gasoline is dispensed into motor vehicle fuel tanks or storage tanks or may occur as a result of leaks in vapor return lines, storage tanks, dispensers, etc. Fugitive TACs from gasoline stations include benzene, ethyl benzene, hexane, toluene and xylene.

2.5.1.1 Military Facilities

A military facility is a facility servicing military forces and, in the United States, under the jurisdiction of the Secretary of the Military Department. Types of military bases include, but are not limited to, the following: arsenal or armory, which is a military site were arms, ammunition, and other military equipment are stored; a military post is an installation at which a body of troops is stationed; military headquarters is the military installation from which a commander performs the functions of command; etc., (U.S. Dept. of Defense, 2005).

Stationary Diesel ICEs: Because military facilities or their operations may be located in remote areas away from population centers, they might not be served by electricity power lines from the local electric utility. Stationary diesel ICEs may be used to provide electricity to military facilities that may not have access to electricity sources; if electricity is available, may be used as a backup source of electricity in the event of a power outage. See discussion 2.5.1.1 regarding stationary diesel ICEs and TAC emissions.

2.5.1.12 Manufacturing Facilities

Facilities most anticipated to be affected by draft Rule 11-18 are described in Subsections 2.5.1.1 through 2.5.1.11. However, to ensure that other sources of TAC emissions are not overlooked, Air District staff has identified the manufacturing facilities category as a catch-all category. Sources that may be included in this category include, but are not limited to: colleges and universities; airline operations; grocery or convenience stores that refrigerate fresh or frozen foods; food preparation facilities that require chillers or refrigeration, e.g., ice cream manufacturing, breweries, frozen food packaging; research laboratories, etc.

Stationary Diesel ICEs: Manufacturing facilities would likely need backup stationary diesel ICEs to provide power in the event of electricity blackouts to maintain computers, laboratory experiments, refrigeration so foods do not spoil, etc. See discussion in Subsection 2.5.1.1 regarding stationary diesel ICEs and TAC emissions.

2.5.2 Control Technologies that May Be Used to Comply with Regulation 11, Rule 18

Draft Rule 11-18 would apply to existing facilities and would require preparation of a risk reduction plan for those facilities that pose a health risk in excess of the proposed risk action levels, 10 per million cancer risk level or a 1.0 hazard index. If a facility is identified that exceeds the risk action levels the facility must either: implement an Air District-approved risk reduction plan that details how the facility would reduce its health risk below the risk action level in the specified timeframe or demonstrate to the Air District that all significant sources of risk are controlled with TBARCT.

To comply with the risk action levels for those affected facilities that are required to prepare a risk reduction plan, operators could reduce operations or install TBARCT equipment. Table 2.5-2 identifies the types of facilities affected by the draft rule, the primary sources of TAC emissions, and the most likely types of control technologies that would be used to reduce risk. The following subsections briefly describe the most likely types of control technologies that would be used to comply with the risk reduction requirements of draft Rule 11-18.

Table 2.5-2
Summary of Toxic Air Contaminant Control Equipment

Facility	Sources	Control Equipment
Refineries	Fugitive Emissions	Establish requirements for more frequent inspections, require replacement of non-repairable valves, flanges, pressure relief devices, etc. (similar to or more stringent than Rule 8-19)
	Stack Emissions	Baghouse with high efficiency filter, LoTOx™ with WGS, UltraCat
	Diesel Engines	Require emission limits based on the most efficient DPF, DOC (similar to or more stringent than Rule 11-17)
	Cooling Towers	Tighten requirements in Rule 11-10 for more frequent inspections and shorten time-period to comply once leak is detected (similar to or more stringent than Rule 11-10[a])
	Wastewater Treatment Operations	Require high collection efficiency of the organic compound recovery system, shorten period between inspections of wastewater collection systems (similar to or more stringent than Rule 8-18)
Data Centers	Stationary Diesel Engines	Require emission limits based on the most efficient DPF, DOC (similar to or more stringent than Rule 11-17)
Cement Manufacturing	Stack Emissions	Require baghouses with high efficiency filters (similar to or more stringent than Rule 9-13)
	Fugitive Emissions	Require enclosed conveyors and storage piles, rumble grates, conveyor skirting, dust curtains, road paving, reducing traffic speed and volume (similar to or more stringent than Rule 9-13)
Chemical Plants	Stack Emissions	Wet gas scrubber
	Fugitive Emissions	Establish requirements for more frequent inspections, require replacement of non-repairable valves, flanges,

Facility	Sources	Control Equipment
		pressure relief devices, etc. (similar to or more stringent than Rule 8-22), baghouse with high efficiency filter
Crematoria	Stack Emissions	Baghouse with high efficiency filter
Landfills	Fugitive Emissions	Gas collection and control systems under continuous operation and under negative pressure at all times, enclosed thermal oxidizer with a destruction efficiency of 99%
	Diesel Engines	Require emission limits based on the most efficient DPF, DOC, (similar to or more stringent than Rule 11-17)
Foundries	Fugitive Emissions	Baghouse with high efficiency filter
Sewage Treatment Facilities	Fugitive Emission	Enclose piping, process units, settling basins, lift stations, etc.
	Stack Emissions	Steam stripping and air stripping off-gases vented to a control or collection device, such as a combustion device (thermal oxidizer) or gas-phase carbon adsorber. Wet gas scrubbers and afterburners to control heavy metals, acid gas.
Power Plants	Stack Emissions	Baghouse with high efficiency filter, LoTOx™ with WGS, UltrCat
Gasoline Stations	Fugitive Emissions	Establish requirements such as removing exemptions on various equipment or operations (similar to, or more stringent than Rule 8-7
Military Facilities	Diesel Engines	Require emission limits based on the most efficient DPF, DOC, (similar to or more stringent than Rule 11-17)
Manufacturing	Diesel Engines	Require emission limits based on the most efficient DPF, DOC, (similar to or more stringent than Rule 11-17)

[a] Effective July 1, 2016, Rule 11-10 prohibited use of chromium chemicals in all cooling towers in the district.

DOC = diesel oxidation catalyst, DPF = diesel particulate filter

2.5.2.1 Baghouses with High Efficiency Filters

A baghouse is an air filtration control device designed to remove particulate matter emissions (both PM_{10} and $PM_{2.5}$) from an exhaust gas stream using filter bags, cartridge-type filters, or envelope-type filters. A baghouse consists of the following components: filter medium and support, filter cleaning device, collection hopper, shell, and fan. Most baghouse designs employ long cylindrical tubes (bags) that contain various types of fabric as the filtering medium. When particulate-laden air flows to the inlet of a baghouse, particulates are filtered through the filter bags inside the baghouse and filtered air flows from the outlet of the baghouse. Particulate layers (dust cakes) deposited on the surface of the bags need to be cleaned periodically to prevent excessive increase of pressure drops across the baghouse, which may lead to bag leak resulting in failure of proper baghouse function. Baghouses are generally not used with catalytic cracking units because of the space required and because of the pressure drop they cause in the flue gas stream (STAPPA/ALAPCO, 2006).

The bag material or fabric media is an important part of baghouse design and selection, as it determines the life and effectiveness of the filter bag. Fabric filter media must be compatible both physically and chemically with the gas stream and system conditions. Baghouse filters with polytetrafluoroethylene (PTFE) (also known by the brand name Teflon®) membrane generally have higher control efficiencies than other filter constructions in many applications. Independent testing conducted under the EPA's Environmental Technology Verification (ETV) program has verified that one of the most efficient filters is PTFE membrane filters, which is capable of ultra-high control efficiencies. Tests of PTFE filter bags from several different manufacturers showed particulate matter control efficiencies of 99 to 99.9 percent for particle sizes down to 1.0 or 2.0 μm to less than 1.0 μm when properly operated and maintained (U.S. EPA, 1998). Among its many useful properties, PTFE is hydrophobic, meaning it repels water. Additionally, it has a very low coefficient of friction of 0.05 – 0.10 (meaning substances have a hard time sticking to it and are easily removed) and has a high melting point of approximately 617 ºF (325°C).

Because of the microporous nature of PTFE, air-to-cloth ratios for these applications are lower than with conventional fabrics, requiring more collector area for a given volume flow rate of gas at a higher relative pressure drop. The current trend in bag cleaning is the pulsejet technology, where tubular bags are supported from the inside by metal wire frames. Gas flows across the fabric from the outside inward, exiting at the top of the bags. Periodically, a blast of compressed air from a fixed nozzle located inside the wire frame causes the bag to inflate outward, thus knocking the accumulated dust off the bag exterior and into the baghouse hopper, ready for collection and disposal.

2.5.2.2 Carbon Adsorber

Adsorption is a process by which VOCs are retained on the surface of granular solids. The solid adsorbent particles are highly porous and have very large surface-to-volume ratios. Gas molecules penetrate the pores of the adsorbent and contact the large surface area available for adsorption. Activated carbon is the most common adsorbent for VOC removal. Advantages of carbon adsorption include the recovery of a relatively pure product for recycle and reuse and a high removal efficiency with low inlet concentrations. In addition, if a process stream is already available onsite additional fuel costs are low, the main energy requirement being electrical power to run fan motors.

Fixed, moving, or fluidized-bed regenerative carbon adsorption systems operate in two modes, adsorption and desorption. Adsorption is rapid and removes from 50 to 99 percent of VOCs in the air stream, depending on their composition, concentration, temperature, and bed characteristics. Well-designed and operated systems, however, can usually achieve removal efficiencies in the 90 to 99 percent range. Eventually, the adsorbent becomes saturated with the vapors and system efficiency drops. At this point (called "breakthrough," since the contaminants "break through" the saturated bed), the VOC contaminated stream is directed to another bed containing regenerated adsorbent, and the saturated bed is then regenerated. Although it is possible to operate a non-regenerative adsorption system (i.e., the saturated carbon is disposed of and fresh carbon is placed into the bed), most applications, especially those with high VOC loadings, are regenerative.

2.5.2.3 Diesel Oxidation Catalyst

Oxidation catalysts have two simultaneous tasks: 1) oxidation of carbon monoxide to CO_2 and 2) oxidation of unburned hydrocarbons (unburned and partially-burned fuel) to CO_2 and water. An oxidation catalyst contains materials (generally precious metals such as platinum or palladium) that promote oxidation reactions between oxygen, CO, and VOC to produce CO_2 and water vapor. These reactions occur when exhaust at the proper temperature and containing sufficient oxygen passes through the catalyst. Depending on the catalyst formulation, an oxidation catalyst may obtain reductions at temperatures as low as 300 ºF to 400 ºF, although minimum temperatures in the 600 ºF to 700 ºF range are generally required to achieve maximum reductions. The catalyst will maintain adequate performance at temperatures typically as high as 1,350 ºF before problems with physical degradation of the catalyst occur. In the case of rich-burn engines, where the exhaust does not contain enough oxygen to fully oxidize the CO and VOC in the exhaust, air can be injected into the exhaust upstream of the catalyst. Diesel oxidation catalysts are widely used on lean-burn engines to reduce hydrocarbon and carbon monoxide emissions. The oxidation catalyst is a corrugated base metal substrate with an alumina wash coat loaded with precious metals such as platinum. The alumina is porous allowing for large surface areas to promote oxidation of any unreacted CO and hydrocarbons with oxygen remaining in the exhaust gas. Most oxidation catalysts can be retrofitted onto the engine without disruption of the existing design configuration.

2.5.2.4 Diesel Particulate Filter

To further reduce DPM emissions from stationary diesel ICEs, the ICEs could be retrofitted with DPFs. DPFs allow exhaust gases to pass through the filter medium, but trap DPM before it is released to the atmosphere. Depending on an engine's baseline emissions and emission test method or duty cycle, DPFs can achieve DPM emission reduction efficiencies from the exhaust of 70 to 90 percent. In addition, DPFs can reduce HC emissions by 95 percent and CO emissions by 90 percent. Limited test data indicate that DPFs can also reduce NOx emissions by six to ten percent.

Particulates build up in the traps over time and must be removed by burning because they are mainly carbon. Some designs use electrical resistance heaters to raise the temperature in the trap high enough to burn off the particulates. Others have a burner built into the trap. Currently, the most common regeneration scheme employs "post injection," in which a small amount of fuel is injected into the cylinder late in the expansion stroke. This fuel then burns in the exhaust system, raising the trap temperature to the point where the accumulated particulate matter is readily burned away.

There are both active DPFs and passive DPFs. Active DPFs use heat generated by means other than exhaust gases (e.g., electricity, fuel burners, and additional fuel injection to increase exhaust gas temperatures) to assist in the regeneration process. Passive DPFs, which do not require an external heat source to regenerate, incorporate a catalytic material, typically a platinum group metal, to assist in oxidizing trapped diesel PM.

2.5.2.5 Thermal Oxidizers

There are three main categories of thermal oxidizers that could be used to control volatile TAC emissions: afterburners with no heat recovery, thermal oxidizers with recuperative heat recovery, and highly efficient regenerative heat recovery oxidizers. Afterburners with no heat recovery are the most likely types of thermal oxidizer anticipated to control TAC emissions. Thermal oxidizers, or thermal incinerators, are combustion devices that control volatile TAC emissions by combusting them to CO_2 and water.

Three main factors contributing to the effectiveness of thermal oxidizers are temperature, residence time, and turbulence. The temperature needs to be high enough to ignite the waste gas. Most organic compounds ignite at the temperature between 1,094 °F (590 °C) and 1,202 °F (650 °C). To ensure destruction of hazardous gases, most basic oxidizers are operated at much higher temperature levels. Residence time is important for ensuring that there is enough time for the combustion reaction to occur. The turbulence factor is the mixture of combustion air with the hazardous gases.

2.5.2.6 UltraCat

UltraCat is a commercially available multi-pollutant control technology designed to remove NOx and other pollutants such as SO_2, PM, hydrochloric acid, dioxins, and TACs such as mercury in low temperature applications. UltraCat technology is comprised of filter tubes which are made of fibrous ceramic materials embedded with proprietary catalysts. The optimal operating temperature range of an UltraCat system is approximately 350 ºF to 750 ºF. To achieve a NOx removal efficiency of approximately 95 percent, aqueous ammonia is injected upstream of the UltraCat filters. In addition, to remove SO_2, HCl, and other acid gases with a removal efficiency ranging from 90 percent to 98 percent, dry sorbent such as hydrated lime, sodium bicarbonate or trona is also injected upstream of the UltraCat filters. UltraCat is also capable of controlling particulates to a level of 0.001 grains per standard cubic foot of dry gas (dscf).

The UltraCat filters are arranged in a baghouse configuration with a low pressure drop such as five inches water column (in water) across the system. The UltraCat system is equipped with a reverse pulse-jet cleaning action that back flushes the filters with air and inert gas to dislodge the PM deposited on the outside of the filter tubes. Depending on the loading, catalytic filter tubes need to be replaced every five to 10 years (Tri-Mer Corp., 2013).

2.5.2.7 Wet Gas Scrubber

In wet scrubbing processes, liquid or solid particles are removed from a gas stream by transferring them to a liquid. This addresses only wet scrubbers for control of particulate matter. The liquid most commonly used is water. A wet scrubber's particulate collection efficiency is directly related to the amount of energy expended in contacting the gas stream with the scrubber liquid. Most wet scrubbing systems operate with particulate collection efficiencies over 95 percent (U.S. EPA, 2017).

There are three energy usage levels for wet scrubbers. A low energy wet scrubber is capable of efficiently removing particles greater than about 5-10 micrometers in diameter. A medium energy scrubber is capable of removing micrometer-sized particles, but is not very efficient on sub-micrometer particles. A high-energy scrubber is able to remove sub-micrometer particles.

A spray tower scrubber is a low energy scrubber and is the simplest wet scrubber used for particulate control. It consists of an open vessel with one or more sets of spray nozzles to distribute the scrubbing liquid. Typically, the gas stream enters at the bottom and passes upward through the sprays. The particles are collected when they impact the droplets. This is referred to as counter-current operation. Spray towers can also be operated in a cross-current arrangement. In cross-current scrubbers, the gas flow is horizontal and the liquid sprays flow downward. Cross-current spray towers are not usually as efficient as counter-current units.

The most common high energy wet scrubber is the venturi, although it can also be operated as a medium energy scrubber. In a fixed-throat venturi, the gas stream enters a converging section where it is accelerated toward the throat section. In the throat section, the high-velocity gas stream strikes liquid streams that are injected at right angles to the gas flow, shattering the liquid into small drops. The particles are collected when they impact the slower moving drops. Following the throat section, the gas stream passes through a diverging section that reduces the velocity.

All wet scrubber designs incorporate mist eliminators or entrainment separators to remove entrained droplets. The process of contacting the gas and liquid streams results in entrained droplets, which contain the contaminants or particulate matter. The most common mist eliminators are chevrons, mesh pads, and cyclones. Chevrons are simply zig-zag baffles that cause the gas stream to turn several times as it passes through the mist eliminator. The liquid droplets are collected on the blades of the chevron and drain back into the scrubber. Mesh pads are made from interlaced fibers that serve as the collection area. A cyclone is typically used for the small droplets generated in a venturi scrubber. The gas stream exiting the venturi enters the bottom of a vertical cylinder tangentially. The droplets are removed by centrifugal force as the gas stream spirals upward to the outlet.

2.5.3 Refinery Equipment Potentially Affected by Draft Rule 12-16

Draft Rule 12-16 would set emission limits for each affected refinery and the three affected support facilities. As noted in the project description above, the rule would then establish an emission limit which is seven percent higher than the highest emission rate during the baseline period. Pollutants subject to the facility emission limits include GHGs; particulate matter, both $PM_{2.5}$ and PM_{10}; NOx; and SO_2.

According to the Staff Report for the draft rules, the emissions limits established for each facility do not appear to inhibit refining capacity, since typical annual average utilization is 80 – 87 percent, and the emissions limits appear to establish production capacity limits at approximately 89 – 93 percent utilization. That is, the caps in draft Rule 12-16 appear to be consistent with the current maximum production capability of the refineries. Given that the emission limits are consistent with the current production capacity; affected facility operators may not be required to install control equipment if crude oil throughput and, therefore, fuel consumption do not substantially increase.

If affected facilities exceed their emission limits or affected facility operators decide to increase crude oil throughput, to capture greater market share for example, then to remain in compliance with draft Rule 12-16 the most likely means of reducing $PM_{2.5}$, PM_{10}, NOx, or SO_2 emissions would be to further control emissions sources of these regulated pollutants at the affected facilities. The following sections and subsections identify the affected facilities' emissions sources that may be subject to draft Rule 12-16 and the most likely control technologies anticipated to be used for affected facilities and emissions sources.

It is currently unknown if any affected refineries would exceed any of the future facility-specific emission limits for $PM_{2.5}$, PM_{10}, NOx, or SO_2. However, some types of refinery equipment that emit $PM_{2.5}$, PM_{10}, NOx, or SO_2 can be identified (see Table 2.5-1). The sections below identify and briefly describe typical types of refinery equipment that emit $PM_{2.5}$, PM_{10}, NOx, or SO_2 and that would most likely be subject to further control, if required, as they tend to be the largest sources of emissions that may be affected by Rule 12-16. In some cases, refinery equipment may emit one pollutant or any combination of pollutants subject to Rule 12-16. Similarly, the most likely types of SO_2, $PM_{2.5}$, and NOx emission control technologies associated with the largest SO_2, $PM_{2.5}$ and NOx emission sources at an affected refinery or support facility can also be identified (see Table 2.5-3). In some cases, control equipment identified below may reduce one or more pollutants subject to the proposed project. Potential secondary impacts from the control equipment identified below have been further analyzed in Chapter 3.

TABLE 2.5-3
Control Technologies by Source Category and Pollutant

	Pollutant		
Equipment Type	SO_2	$PM_{2.5}$	NOx
Boiler	FGT	Baghouse; ESP	SCR
DCU	Compressor; SET	Compressor; SET	
Diesel ICE		DPF, DOC	
FCCU	WGS, SRA	Cyclone, ESP	SCR, LoTOx^{TM} with WGS
PCC	WGS	Baghouse	LoTOxTM with scrubber, UltraCat with WGS
Process Heater	FGT	Baghouse; ESP	SCR
SRU/TGU	WGS; SOC	WGS	SCR, LoTOx^{TM} with WGS,
Refinery Gas Turbine			SCR

DCU = Delayed Coking Unit; DOC = Diesel Oxidation Catalyst; DPF = Diesel Particulate Filter; ESP = Electrostatic Precipitator: ICE = Internal Combustion Engine; FGT = Flue Gas Treatment; FCCU = Fluid Catalytic Cracking Unit; LoTOx^{TM} = Low Temperature Oxidation, PCC = Petroleum Coke Calciner; SCR = Selective Catalytic Reduction, SOC = SOx Oxidation Catalyst; SRA = SOx Reducing Additives; SRU = Sulfur Recovery Unit; SET = Steam Ejector Technology; TGU = Tail Gas Unit; UltraCat, WGS = Wet Gas Scrubber;

2.5.3.1 Delayed Coking Unit (DCU) ($PM_{2.5}$ and GHGs)

For a complete description of DCUs, refer to Subsection 2.5.2.1.

2.5.3.2 Diesel Internal Combustion Engines (ICEs) (NOx and PM)

For a complete description of diesel ICEs, refer to Subsection 2.5.2.1.

2.5.3.3 Fluid Catalytic Cracking Units (FCCUs) (SO_2, NOx, and $PM_{2.5}$)

An FCCU is a major source of SO_2, NOx, and $PM_{2.5}$ emissions at refineries. The purpose of an FCCU at a refinery is to convert or “crack” heavy oils (hydrocarbons), with the assistance of a catalyst, into gasoline and lighter petroleum products. Each FCCU consists of three main components: a reaction chamber, a catalyst regenerator and a fractionator. Crude enters the reaction chamber, where it is mixed with a catalyst, typically a fine powder, under high heat. A chemical reaction occurs that converts the heavy oil liquid into a cracked hydrocarbon vapor mixed with catalyst. The cracked hydrocarbon vapor is routed to a distillation column or fractionator for further separation into lighter hydrocarbon components. Eventually, the catalyst becomes inactive or spent and is regenerated, first by removing oil residue using steam stripping. The spent catalyst is then sent to the catalyst regenerator where hot air burns the coke layer off the surface of each catalyst particle to produce reactivated or regenerated catalyst. Subsequently, the regenerated catalyst is cycled back to the reaction chamber and mixed with more fresh heavy liquid oil feed.

The primary source of SO_2, NOx, and $PM_{2.5}$ emissions from the catalytic cracking process is the catalyst regenerator unit. (The waste heat from the regenerator unit also provides much of the heat required by the catalytic cracking process.) During the cracking process, coke is deposited on the surface of the catalyst, deactivating the material. The catalyst is regenerated by burning off the coke at high temperatures. The flue gas from the regenerator unit contains SO_2, $PM_{2.5}$, and catalyst fines. In addition, organic metals in heavy gas oils can be deposited on the coke formed in the FCCU. When the coke is burned in the regenerator unit, these metals then deposit onto the catalyst. A portion of this catalyst is emitted from the FCC as particulates containing these metal compounds.

Of the total NOx emissions that can be generated, there are two types of NOx formed during combustion: 1) thermal NOx; and, 2) fuel NOx. Thermal NOx is produced from the reaction between the nitrogen and oxygen in the combustion air at high temperatures while fuel NOx is formed from a reaction between the nitrogen already present in the fuel and the available oxygen in the combustion air. As the source of nitrogen in fuel is more prevalent in oil and coal, and is negligible in natural gas, the amount of fuel NOx generated is dependent on fuel type. Based on the preceding information, NOx emissions are generated during the combustion process in the catalyst regenerator unit.

2.5.3.4 Petroleum Coke Calciner (SO_2, NOx, and $PM_{2.5}$)

For a complete description of petroleum coke calciners, refer to Subsection 2.5.2.1.

2.5.3.5 Refinery Gas Turbines (NOx and GHGs)

Gas turbines are used in refineries to produce both electricity and steam. Refinery gas turbines are typically combined cycle units that use two work cycles from the same shaft operation. Refinery gas turbines also have an additional element of heat recovery from its exhaust gases to produce more power by way of a steam generator. Gas turbines can operate on both gaseous and liquid fuels. Gaseous fuels include natural gas, process gas, and refinery gas. Liquid fuels typically include diesel. The units in this category are cogenerating units that recover the useful energy from heat recovery for producing process steam. For additional information on gas turbines, see Subsection 2.5.1.8

2.5.3.6 Refinery Process Heaters and Boilers (SO_2, NOx, and $PM_{2.5}$)

Refinery process heaters and boilers are major sources of SO_2, NOx, and $PM_{2.5}$ emissions at most refineries. Refinery process heaters and boilers are used extensively throughout various processes in refinery operations such as distillation, hydrotreating, fluid catalytic cracking, alkylation, reforming, and delayed coking. A process heater is an enclosed device in which solid, liquid or gaseous fuels are combusted for the purpose of heating a process material (e.g., crude oil). There are two basic types of process heaters: direct and indirect. Direct-fired systems place the combustion gases in direct contact with the process material. Indirect systems rely on tubing to separate the combustion gases from the process material.

Refinery boilers are used primarily for heating and separating hydrocarbon streams and, to a lesser extent, for producing electricity. Refinery process heaters and boilers are primarily fueled by refinery gas, one of several products generated at a refinery. In addition, most refinery process heaters and boilers are designed to also operate on natural gas. The combustion of fuel generates NOx, primarily "thermal" NOx with small contribution from "fuel" NOx.

When used for heating, the steam usually heats the petroleum indirectly in heat exchangers and returns to the boiler. In direct contact operations, the steam serves as a stripping medium or a process fluid. SO_2 and $PM_{2.5}$, emissions are typically created from the combustion of fuel that contains sulfur or sulfur compounds.

2.5.3.7 Sulfur Recovery Units and Tail Gas Units (SRU/TGUs) (SO_2 and NOx)

Refinery SRU/TGUs, including their incinerators, are classified as major sources of both NOx and SOx emissions. Because sulfur is a naturally occurring and undesirable component of crude oil, refineries employ a sulfur recovery system to maximize sulfur removal, which also generates SO_2 emissions. A typical sulfur removal or recovery system will include a sulfur recovery unit (e.g., Claus unit) followed by a tail gas treatment unit (e.g., amine treating) for maximum removal of hydrogen sulfide (H_2S). A Claus unit consists of a reactor, catalytic converters and condensers. Two chemical reactions occur in a Claus unit. The first reaction occurs in the reactor, where a portion of H_2S reacts with air to form SO_2, followed by a second reaction in the catalytic converters where SO_2 reacts with H_2S to form liquid elemental sulfur. The combination of two converters with two condensers in series will generally remove as much as 95 percent of the sulfur from the incoming acid gas.

To recover the remaining sulfur compounds after the final pass through the last condenser, the gas is sent to a tail gas treatment process such as a SCOT or Wellman-Lord where the sulfur compounds in the tail gas are converted to H_2S. The H_2S is absorbed by a solution of amine in the H_2S absorber, steam-stripped from the absorbent solution in the H_2S stripper, concentrated, and recycled to the front end of the sulfur recovery unit. The residual H_2S in the treated gas from the absorber is typically vented to a thermal oxidizer where it is oxidized to SO_2 before venting to the atmosphere.

The Wellman-Lord tail gas treatment process is a process where the sulfur compounds in the tail gas are first incinerated to oxidize to SO_2. After the incinerator, the tail gas enters a SO_2 absorber, where the SO_2 is absorbed in a sodium sulfite (Na_2SO_3) solution to form sodium bisulfite ($NaHSO_3$) and sodium pyrosulfate ($Na_2S_2O_5$). The absorbent, rich in SO_2, is then stripped and the SO_2 is recycled back to the beginning of the Claus unit. The residual sulfur compounds in the treated tail gas from the SO_2 absorber are then vented to a thermal oxidizer where they are oxidized to SO_2 before venting to the atmosphere.

The sulfur recovery unit typically includes a combustion chamber used to produce steam that selectively converts the H_2S in the presence of water vapor and excess oxygen to elemental sulfur only. The catalyst is also steam stripped to remove any hydrocarbons from it prior to regeneration by coke burnoff. The amine solution is regenerated by heating and the concentrated acid gas is then sent to a sulfur recovery plant located within the refinery. Because SRU/TGUs include one or more combustion processes, they have the potential to emit NOx emissions.

2.5.4 Applicable SO_2, NOx, $PM_{2.5}$ and PM_{10} Emissions Control Technologies Used at Refineries

If an affected refinery's SO_2, NOx, $PM_{2.5}$, and PM_{10} emissions exceed the refinery-wide annual emission limits in Regulation 12-16, the refinery operators must undertake emission reduction strategies, such as reducing throughput, or install air pollution control equipment. Table 2.5-3 above shows the most likely SO_2, NOx, $PM_{2.5}$, and PM_{10} control technologies expected to be used. Control technologies anticipated to be used to comply with draft Rule 12-16 are briefly described in the following subsections.

2.5.4.1 Baghouse

For a complete description of baghouse in combination with high efficiency filters, refer to Subsection 2.5.2.1.

2..5.4.2 Cyclones

A cyclone, typically used as a pre-cleaner, does not have a blower mount to induce the particle-laden exhaust gas stream. Centrifugal force causes particles in the gas stream (both PM_{10} and $PM_{2.5}$) to enter the cyclone tangentially, which moves the particulate against the cyclone's cone wall. Air flows in a helical pattern, beginning at the top (wide end) of the cyclone and ending at the bottom (narrow) end before exiting the cyclone in a straight stream through the center of the cyclone and out the top. Larger (denser) particles in the rotating stream have too much inertia to follow the tight curve of the stream, and strike the outside wall, then fall to the bottom of the cyclone where they can be removed and sent to a storage unit. In a conical system, as the rotating flow moves towards the narrow end of the cyclone, the rotational radius of the stream is reduced, thus, separating smaller and smaller particles. The cyclone geometry, together with flow rate, defines the cut point of the cyclone. Cut point is the size of particle that will be removed from the stream with a 50 percent efficiency. Particles larger than the cut point will be removed out of the airstream with a greater efficiency and smaller particles with a lower efficiency. Greater centrifugal airflow improves particle separation and increases collection efficiency. Installing a cyclone is an attractive $PM_{2.5}$ control option because this technology is designed specifically for harsh, industrial environments and can operate in applications generating (both PM_{10} and $PM_{2.5}$) heavy particulate and high temperatures.

2.5.4.3 Depressurizing Delayed Coking Units

To minimize atmospheric venting at the end of the coking cycle, more of the vapors remaining in the head space above the coke in the drum can be sent to the blowdown system prior to opening the drum provided that the pressure in the drum head space is higher than that of the blowdown system. This pressure differential will cause the vapors to be routed to the blowdown system allowing more vapors to be captured. However, once the pressures equalize between the drum and the blowdown system, the only way to depressurize the drum to ambient pressure is to vent the remaining vapors, which primarily consist of steam (roughly 97 percent to 99 percent), from the drum to the atmosphere before drilling of the coke bed can commence. DCUs typically route the head space vapors in the coke drum to a blowdown system where recovered hydrocarbons are sent to the refinery fuel gas system.

One way to minimize emissions during coke drum venting would be to change the process by increasing the drum cooling time. Waiting longer before opening the coke drum would allow it to cool down further. Because refineries are comprised of multiple, sophisticated inter-connected and inter-dependent systems, any potential process changes could have unintended consequences that may cause other bottlenecks and throughput problems elsewhere. For these reasons, it is impractical and improbable that refinery operators would choose to allow additional time for the coke drums to cool, as other alternatives are available.

Another way to minimize emissions to atmosphere would be to increase the rate at which vapors are evacuated from the head space to the blowdown system. This can be accomplished by installing either compressor or steam ejector technology to create a pressure differential that would more quickly lower the drum's internal pressure (e.g., to less than two psig) as close as currently possible to ambient pressure (i.e., by definition, zero psig) before venting the drum to the atmosphere at the end of the coking cycle. Either of these devices could effectively serve as emissions control equipment by achieving lower pressures within the coke drum at the end of the coking cycle.

A compressor is a device used to compress gases and/or vapors with the support of an electric motor, internal combustion engine or steam. Compressors can handle a constant volume of gases with various discharge pressures. The volume of gas can be varied only by changing the motor speed or under-utilizing the design capacity of the unit. A sliding vane and oil flooded rotary screw compressors are commonly used for vapor recovery, but depending on final discharge routing, a reciprocating compressor may also be used.

A steam ejector is a simplified type of pumping device which, unlike a compressor, has no pistons, valves, rotors or other moving parts. A steam ejector consists of a nozzle which discharges a high-speed pressure steam jet across a suction chamber that is connected to the equipment to be evacuated (e.g., the coke drum head space). With a steam ejector in place, the vapors from the coke drum head space would be entrained in the steam from the steam ejector and carried into a venturi-shaped diffuser that would create a strong suction or vacuum effect that would allow for a quick evacuation of the remaining vapors in the coke drum. When comparing overall maintenance and operating costs, steam ejector technology typically has less maintenance requirements and associated costs than compressor technology.

2.5.4.4 Diesel Particulate Filters (DPFs)

For a complete description of DPFs, refer to Subsection 2.5.2.4.

2.5.4.5 Electrostatic Precipitator (ESP)

An ESP is a control device designed to remove particulate matter (both PM_{10} and $PM_{2.5}$) from an exhaust gas stream. ESPs take advantage of the electrical principle that opposites attract. By imparting a high voltage charge to the particles, a high voltage direct current (DC) electrode negatively charges airborne particles in the exhaust stream, while simultaneously ionizing the carrier gas, producing an electrified field. The electric field in an ESP is the result of three contributing factors: the electrostatic component resulting from the application of a voltage in a dual electrode system, the component resulting from the space charge from the ions and free electrons, and the component resulting from the charged particulate. As the exhaust gas passes through this electrified field, the particles are charged. The strength or magnitude of the electric field is an indication of the effectiveness of an ESP. Typically, 20,000 to 70,000 volts are used. The particles, either negatively or positively charged, are attracted to the ESP collecting electrode of the opposite charge. When enough particulates have accumulated, the collectors are shaken to dislodge the dust, causing it to fall by gravity to hoppers below and then removed by a conveyor system for disposal or recycling. ESPs can handle large volumes of exhaust gases and because no filters are used, ESPs can handle hot gases from 350 ºF to 1,300 ºF.

2.5.4.6 Fuel Gas Treatment

According to a study prepared by ETS, Inc., and Nexidea[2], using a flue gas scrubber is not cost-effective for refinery process heaters and boilers. The consultants concluded that for heaters and boilers, post-combustion emission control is often expensive due to the combination of the relatively low concentrations of SO_2 in flue gases and the division of the fuel gas stream among a number of heaters and boilers. Pre-combustion control, e.g., fuel gas treatment, has been found to be more suitable for the majority of situations to obtain SO_2 emission reductions from refinery process heaters and boilers. Therefore, the analysis of potential environmental impacts from the proposed project in Chapter 3 assumes that an affected refinery operator would likely rely on the fuel gas treatment control option to reduce SO_2 emissions from refinery process heaters and boilers instead of using a flue gas scrubber.

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[2] SCAQMD. 2010. Final Staff Report SOx RECLAIM – Part 2 – Summary of Consultant's Analysis. November. http://www.aqmd.gov/home/governing-board/agendas-minutes.

Refinery fuel gas, commonly used for operating refinery process heaters and boilers, is treated in various acid gas processing units such as an amine (Merox[3], for example) treating unit for removal of sour components including hydrogen sulfide (H_2S), carbonyl sulfide (COS), mercaptan, and ammonia. Lean amine is generally used as an absorbent. At the end of the process, the lean amine is regenerated to form rich amine and H_2S is recovered in acid gas, which is then fed to the SRU/TGU for more processing. By improving the efficiency of the amine treating unit to recover more sulfur from the inlet acid gas stream, the sulfur content in the refinery fuel gas at the outlet and subsequently the SO_2 emissions from boilers and heaters that use these refinery fuel gases can be reduced. EmeraChem Power LLC markets a proprietary catalytic gas treatment called selective oxidation catalyst "ESx" that is typically used as a sulfur reducing agent in conjunction with its "EMx NOx trap" catalyst to treat combustion exhaust gases from incinerators, process heaters, turbines, and boilers. The ESx catalyst can also be used as part of SO_2 reduction for sulfur recovery units/tail gas treatment units. The ESx catalyst can reduce multiple sulfur species, including SO_2, SO_3, and H_2S from the tail gas stream while also removing CO, VOC, and $PM_{2.5}$ emissions. ESx catalyst is a platinum group metal catalyst that stores sulfur species and simultaneously assists in the catalytic oxidation of CO and VOCs. The ESx units are typically outfitted with multiple chambers such that at least one chamber is always in regeneration while the other units are working to store SO_2. In the storage process, SO_2 is oxidized to SO_3 and is stored by EmeraChem's sorber. The catalyst regeneration process releases sulfur as SO_2 (Galati, 2008).

2.5.4.7 LoTOx™ Application with Wet Scrubber

The LoTOx™ is a registered trademark of Linde LLC (previously BOC Gases) and was later licensed to BELCO of Dupont for refinery applications. LoTOx™ stands for "Low Temperature Oxidation" process in which ozone (O_3) is used to oxidize insoluble NOx compounds into soluble NOx compounds which can then be removed by absorption in a caustic, lime, or limestone solution. The LoTOx™ process is a low temperature application, optimally operating at about 325 ^oF.

A typical combustion process produces about 95 percent NO and five percent NO_2. Because both NO and NO_2 are relatively insoluble in an aqueous solution, a WGS alone is not efficient in removing these insoluble compounds from the flue gas stream. However, with a LoTOx™ system and the introduction of O_3, NO and NO_2 can be easily oxidized into a highly soluble compound N_2O_5 and subsequently converted to nitric acid (HNO_3). Then, in a wet gas scrubber for example, the HNO_3 is rapidly absorbed in caustic (NaOH), limestone or lime solution. The LoTOx™ process can be integrated with any type of wet scrubbers (e.g., venturi, packed beds), semi-dry scrubbers, or wet electrostatic precipitators (ESPs). In addition, because the rates of oxidizing reactions for NOx are fast compared to

[3] Merox is an acronym for mercapatan oxidation and the treatment process is a proprietary catalytic chemical process used for removing mercaptans from refinery fuel gas by converting them to liquid hydrocarbon disulfides. Merox treatment is an alkaline process that typically uses an aqueous solution of sodium hydroxide (NaOH) or caustic.

the very slow SO_2 oxidation reaction, no ammonium bisulfate ($(NH_4)HSO_4$) or sulfur trioxide (SO_3) is formed (Confuorto and Sexton, 2007).

2.5.4.8 Refinery Wet Gas Scrubber (WGS)

Wet gas scrubbers are used to control both SO_2, $PM_{2.5}$, and PM_{10} emissions. When used in conjunction with LoTOx™ control equipment, they can also be used to reduce NOx emissions. There are two types of wet gas scrubbers: 1) caustic-based non-regenerative WGS; and, 2) regenerative WGS.

In a non-regenerative WGS, caustic soda (sodium hydroxide - NaOH) or other alkaline reagents, such as soda ash, are used as an alkaline absorbing reagent (absorbent) to capture SO_2 emissions. The absorbent captures SO_2 and sulfuric acid mist (H_2SO_4) and converts them to various types of sulfites and sulfates (e.g., $NaHSO_3$, Na_2SO_3, and Na_2SO_4). The absorbed sulfites and sulfates are later separated by a purge treatment system and the treated water, free of suspended solids, is either discharged or recycled.

A regenerative WGS removes SO_2 from the flue gas by using a buffer solution that can be regenerated. The buffer is then sent to a regenerative plant where the SO_2 is extracted as concentrated SO_2. The concentrated SO_2 is then sent to a sulfur recovery unit to recover the liquid SO_2, sulfuric acid, and elemental sulfur as a by-product. When the inlet SO_2 concentrations are high, a substantial amount of sulfur-based by-products can be recovered and later sold as a commodity for use in the fertilizer, chemical, pulp and paper industries. For this reason, the use of a regenerative WGS is favored over a non-regenerative WGS. WGS are generally large users of water; however, regenerative WGS use about 25 percent of the water than a non-regenerative WGS.

2.5.4.9 SOx Reducing Additives

To help reduce condensable particulate matter from sulfur, SOx reducing additives (catalysts) are used for reducing the production of SOx by-products in FCCUs. A SOx reducing catalyst is a metal oxide compound such as aluminum oxide (Al_2O_3), magnesium oxide (MgO), vanadium pentoxide (V_2O_5) or a combination of the three that is added to the FCCU catalyst as it circulates throughout the reactor. In the regenerator of the FCCU, sulfur bearing coke is burned and SO_2, CO, and CO_2 by-products are formed. A portion of SO_2 will react with excess oxygen and form SO_3, which will either stay in the flue gas or react with the metal oxide in the SOx reducing catalyst to form metal sulfate. In the FCCU reactor, the metal sulfate will react with hydrogen to form either metal sulfide and water, or more metal oxide. In the steam stripper section of the FCCU reactor, metal sulfide reacts with steam to form metal oxide and H_2S. The net effect of these reactions is that the quantity of SO_2 in the regenerator is typically reduced between 40 to 65 percent while the quantity of H_2S in the reactor is increased. Generally, the increase in H_2S is handled by sulfur recovery processes located elsewhere within a refinery.

2.5.4.10 UltraCat

For a complete description of UltraCat control systems, refer to Subsection 2.5.2.6.

2.5.5 GHG Emissions Reduction Opportunities

The most common GHG pollutants at the affected refineries and support facilities are CO_2, CH_4, and N_2O. These GHG pollutants are typically generated from combustion processes. However, as noted in the Staff Report for the draft rules, GHG emissions from Bay Area refineries are already regulated under the statewide AB 32 Cap-and-Trade system. All major stationary sources of GHG are included under a statewide cap created by CARB's Cap-and-Trade rule. The total GHG emissions from all these sources combined is required to decline over time to meet statewide GHG reduction goals. Since any local caps in the Bay Area would not reduce the total allowable GHG emissions under the statewide cap, it's unclear how local caps would benefit global climate.

Although affected facilities are already subject to GHG emission reduction requirements, GHG emission reduction opportunities that are available at affected facilities would most likely be in the form energy efficiency improvements rather than installation of add-on control equipment. Major areas for energy-efficiency improvement at refineries are utilities (30 percent), fired heaters (20 percent), process optimization (15 percent), heat exchangers (15 percent), motor and motor applications (10 percent), and other areas (10 percent). Of these areas, optimization of utilities, heat exchangers and fired heaters offer the most low-investment opportunities (IPIECA, 2013).

Some examples of methods to improve energy efficiency include, but are not limited to: improving process monitoring and control systems; using high efficiency motors; using variable speed drives; optimizing compressed air systems; and implementing lighting system efficiency improvements (U.S. EPA, 2010). Process integration refers to the exploitation of potential synergies that are inherent in any system that consists of multiple components working together. In plants that have multiple heating and cooling demands, the use of process integration techniques may significantly improve efficiencies. For example, flue gases throughout the refinery may have sufficient heat content to make it economical to recover the heat. Process integration techniques could be accomplished using an economizer to preheat the boiler feed water.

Another example of measures for improving efficiency for boilers include, but are not limited to, maintaining boilers according to a regular maintenance program. In particular, the burners and condensate return system should be properly adjusted and worn components replaced. Average energy savings of about 10 percent can be realized over a system without regular maintenance. Further, insulation of older boilers may be in poor condition, and the material itself may not insulate as well as newer materials. Replacing the insulation combined with improved controls can reduce energy requirements by six to 26 percent. Insulation on steam distribution systems should also be evaluated. Improving the insulation on the distribution pipes at existing facilities may reduce energy usage by three to 13 percent (U.S. EPA, 2010).

The energy used for lighting at a petroleum refinery facilities represent a small portion of the overall energy usage. However, there are opportunities for cost-effective energy efficiency improvements. Automated lighting controls that shut off lights when not needed may have payback periods of less than two years. Replacing T-12 lights with T-8 lights can reduce energy use by half, as can replacing mercury lights with metal halide or high pressure sodium lights (U.S. EPA, 2010).

Another aspect of energy management may include "life cycle" energy performance over the life time of an asset. For example, especially in upstream oil and gas operations, flow volumes can change substantially over time as a field ramps up to peak production, perhaps levels out, and then eventually decline over time. If fluid production and distribution systems are designed for maximum peak capacity, then they will likely only operate for a limited time at design capacity and may spend most of their time at suboptimal operating conditions which will degrade energy efficiency and possibly lead to reliability issues. Designing facilities to adapt to significant load changes over time and maintain high efficiency operation could lead to large energy savings over the life of the asset (IPIECA, 2013).

Carbon capture and storage (CCS) is a technology that takes greenhouse gases emitted from a facility and pumps them into an underground geological formation in order to prevent them from being emitted into the atmosphere where they can contribute to global warming. A number of industrial-scale CCS projects have come online in recent years and maybe promising in the future. However, CCS requires an appropriate reservoir into which GHG emissions can be injected and in many locations there are no such reservoirs within a feasible distance. Therefore, the use of CCS is currently limited.

As indicated in the paragraphs above, energy efficiency measures to reduce GHG emissions primarily include modifying systems' operations and maintenance as well as using more efficient equipment. As a result, installation of add-on control equipment, such as that used for SO_2, NOx, $PM_{2.5}$, and PM_{10}, are not anticipated to be used to reduce GHG emissions, thus, reducing the possibility of producing secondary environmental impacts. Finally, as mentioned in the Staff Report for the draft rules, the facilities that would be subject to draft Rule 12-16 are already subject to GHG emissions reduction requirements pursuant to the statewide AB 32 Cap-and-Trade system. Consequently, GHG emission reductions would occur regardless of whether or not draft Rule 12-16 is adopted.

CHAPTER 3

ENVIRONMENTAL SETTING, IMPACTS, MITIGATION MEASURES, AND CUMULATIVE IMPACTS

3.0 ENVIROMENTAL SETTING, IMPACTS, MITIGATION MEASURES AND CUMULATIVE IMPACTS

3.1 INTRODUCTION

This chapter of the Draft EIR describes the existing environmental setting in the Bay Area, analyzes the potential environmental impacts of implementing Rules 11-18 and/or 12-16, and recommends mitigation measures (when significant environmental impacts have been identified). The chapter provides this analysis for each of the environmental areas identified in the Initial Study (see Appendix A), which are:

- Air quality;
- Climate change and greenhouse gas emissions;
- Hazards;
- Hydrology and water quality;
- Noise;
- Transportation and traffic; and
- Utilities and service systems.

Included for each impact category is a discussion of the: (1) Environmental Setting; (2) Regulatory Setting; (3) Significance Criteria; (4) Environmental Impacts; (5) Mitigation Measures (if necessary and available); and (6) Cumulative Impacts. A description of each subsection follows.

3.1.1 ENVIRONMENTAL SETTING

CEQA Guidelines §15360 (Public Resources Code Section 21060.5) defines "environment" as "the physical conditions that exist within the area which will be affected by a proposed project including land, air, water, minerals, flora, fauna, ambient noise, and objects of historical or aesthetic significance." CEQA Guidelines §15125(a) requires that an EIR include a description of the physical environmental conditions in the vicinity of the project, as they exist at the time the notice of preparation is published from both a local and regional perspective. This environmental setting will normally constitute the baseline physical conditions by which a lead agency determines whether an impact is significant. The description of the environmental setting is intended to be no longer than is necessary to gain an understanding of the significant effects of the proposed project and its alternatives.

This Chapter describes the existing environment in the Bay Area as it exists at the time the NOP/IS was prepared (October 2016) to the extent that information is available. The analyses included in this chapter focus on those aspects of the environmental resource areas that could be adversely affected by the implementation of the proposed revisions to District permitting regulations as determined in the NOP/IS (see Appendix A), and not those environmental resource areas determined to have no potential adverse impact from the proposed project. The NOP/IS (see Appendix A) determined the air quality, greenhouse gases, hazards and hazardous materials, and hydrology and water quality impacts associated with the proposed amendments were potentially significant and are evaluated in this EIR.

3.1.2 SIGNIFICANCE CRITERIA

This section identifies the criteria used to determine when physical changes to the environment created as a result of the proposed project approval would be considered significant. The levels of significance for each environmental resource were established by identifying significance criteria. These criteria are based upon those presented in the California Environmental Quality Act (CEQA) environmental checklist or are derived by the BAAQMD in this document.

The significance determination under each impact analysis is made by comparing the proposed project impacts with the conditions in the environmental setting and comparing the difference to the significance criteria.

3.1.3 ENVIRONMENTAL IMPACTS

The CEQA Guidelines also require the EIR to identify significant environmental effects that may result from a proposed project (CEQA Guidelines §15126.2(a)). Direct and indirect significant effects of a project on the environment must be identified and described, with consideration given to both short- and long-term impacts. The potential impacts associated with each resource are either quantitatively analyzed where possible or qualitatively analyzed where data are insufficient to quantify impacts. The impacts are compared to the significance criteria to determine the level of significance.

The impact sections of this chapter focus on those impacts that are considered potentially significant per the requirements of CEQA. An impact is considered significant if it leads to a "substantial, or potentially substantial, adverse change in the environment." Impacts from the project fall within one of the following categories:

Beneficial: Impacts will have a positive effect on the resource.

No Impact: There would be no impact to the identified resource as a result of the project.

Less than Significant: Some impacts may result from the project; however, they are judged to be less than significant. Impacts are frequently considered less than significant when the changes are minor relative to the size of the available resource base or would not change an existing resource. A "less than significant impact" applies where the environmental impact does not exceed the significance threshold.

Potentially Significant but Mitigation Measures Can Reduce Impacts to Less Than Significant: Significant adverse impacts may occur; however, with proper mitigation, the impacts can be reduced to less than significant.

Potentially Significant or Significant Impacts: Adverse impacts may occur that would be significant even after mitigation measures have been applied to minimize their severity. A "potentially significant or significant impacts" applies where the environmental impact exceeds the significance threshold, or information was lacking to make a finding of insignificance.

It is important to note that CEQA will also apply to individual projects at the time any permits are submitted in the future in response to the regulation or regulations that may be approved by the Board and the potential for any control equipment or other design modifications to a refinery to have secondary adverse environmental impacts will be evaluated at that time. Should projects be subject to applicable permitting requirements because they are ultimately found to exceed the refinery-wide emissions limits for SO_2 and PM2.5 or the updated HRA shows that additional risk reduction measures are required, a separate project-specific CEQA analysis will be conducted at the time of permitting to ensure that any significant adverse environmental impacts are identified and mitigated, as necessary, or avoided.

3.1.4 MITIGATION MEASURES

If significant adverse environmental impacts are identified, the CEQA Guidelines require a discussion of measures that could either avoid or substantially reduce any adverse environmental impacts to the greatest extent feasible (CEQA Guidelines §15126.4). The analyses in this chapter describe the potential for significant adverse impacts and identify mitigation measures where appropriate. This section describes feasible mitigation measures that could minimize potentially significant or significant impacts that may result from project approval. CEQA Guidelines (§15370) defines mitigation to include:

- Avoiding the impact altogether by not taking a certain action or parts of an action.
- Minimizing impacts by limiting the degree or magnitude of the action and its implementation.
- Rectifying the impact by repairing, rehabilitating or restoring the impacted environment.
- Reducing or eliminating the impact over time by preservation and maintenance operations during the life of the action.
- Compensating for the impact by replacing or providing substitute resources or environments.

The program would identify specific mitigation measures to be undertaken, when the measure would be implemented, and the agency responsible for oversight, implementation and enforcement.

3.1.5 CUMULATIVE IMPACTS

CEQA Guidelines §15130(a) requires an EIR to discuss cumulative impacts of a project when the project's incremental effect is cumulatively considerable. An EIR evaluating the environmental impact of air quality regulations essentially evaluates the cumulative impacts associated with a variety of regulatory activities. As such, this EIR evaluates the cumulative environmental impacts associated with implementation of other air quality regulations as outlined in the 2017 Clean Air Plan, the most recent air plan for the Bay Area (BAAQMD, 2017). The area evaluated for cumulative impacts in this EIR is the area within the jurisdiction of the District, an area encompassing 5,600 square miles, which includes all of Alameda, Contra Costa, Marin, San Francisco, San Mateo, Santa Clara, and Napa Counties, and portions of southwestern Solano and southern Sonoma counties.

CHAPTER 3.2

AIR QUALITY IMPACTS

3.2 AIR QUALITY

This subchapter of the EIR evaluates the potential air quality impacts associated with implementation of Rules 11-18 and/or 12-16. Rule 12-16 would establish numeric emission limits on specific refinery and associated facilities within the Bay Area. Rule 11-18 would reduce exposure to TAC emissions from a number of stationary sources within the Bay Area, including refineries.

As discussed in the Initial Study, implementation of Rule 11-18 would reduce risk from facilities that emit toxic air contaminants throughout the Bay Area. However, certain risk reduction measures have the potential to increase emissions of other pollutants, such as GHGs and criteria pollutants. Implementation of Rule 12-16 would prevent refinery emissions of GHGs and some criteria pollutants from increasing. Similarly, secondary adverse air quality impacts could occur from installing control equipment at individual refineries in response to changes that could increase emissions some of criteria pollutants. Adverse impacts include increased criteria pollutant and TAC emissions from certain types of air pollution control equipment. The NOP/IS (see Appendix A) determined that air quality impacts of the proposed new rules are potentially significant. Project-specific and cumulative adverse air quality impacts associated with the proposed new rules on air contaminants (including criteria air pollutants and TACs) have been evaluated in Chapter 3.2 of this EIR.

3.2.1 ENVIRONMENTAL SETTING

3.2.1.1 Criteria Pollutants

Ambient Air Quality Standards

It is the responsibility of the Air District to ensure that state and federal ambient air quality standards (AAQS) are achieved and maintained in its geographical jurisdiction. Health-based air quality standards have been established by California and the federal government for the following criteria air pollutants: ozone (O_3), carbon monoxide (CO), nitrogen dioxide (NO_2), particulate matter (PM10 and PM2.5), sulfur dioxide (SO_2), and lead (Pb). These standards were established to protect sensitive receptors with a margin of safety from adverse health impacts due to exposure to air pollution. California has also established standards for sulfate, visibility, hydrogen sulfide, and vinyl chloride. The state and national NAAQS for each of these pollutants and their effects on health are summarized in Table 3.2-1.

TABLE 3.2-1

Federal and State Ambient Air Quality Standards

	STATE STANDARD	FEDERAL PRIMARY STANDARD	MOST RELEVANT EFFECTS
AIR POLLUTANT	CONCENTRATION/ AVERAGING TIME	CONCENTRATION/ AVERAGING TIME	
Ozone	0.09 ppm, 1-hr. avg. > 0.070 ppm, 8-hr	No Federal 1-hr standard 0.070 ppm, 8-hr avg. >	(a) Short-term exposures: (1) Pulmonary function decrements and localized lung edema in humans and animals (2) Risk to public health implied by alterations in pulmonary morphology and host defense in animals; (b) Long-term exposures: Risk to public health implied by altered connective tissue metabolism and altered pulmonary morphology in animals after long-term exposures and pulmonary function decrements in chronically exposed humans; (c) Vegetation damage; (d) Property damage
Carbon Monoxide	9.0 ppm, 8-hr avg. > 20 ppm, 1-hr avg. >	9 ppm, 8-hr avg.> 35 ppm, 1-hr avg.>	(a) Aggravation of angina pectoris and other aspects of coronary heart disease; (b) Decreased exercise tolerance in persons with peripheral vascular disease and lung disease; (c) Impairment of central nervous system functions; (d) Possible increased risk to fetuses
Nitrogen Dioxide	0.030 ppm, annual avg. 0.18 ppm, 1-hr avg. >	0.053 ppm, ann. avg.> 0.100 ppm, 1-hr avg.	(a) Potential to aggravate chronic respiratory disease and respiratory symptoms in sensitive groups; (b) Risk to public health implied by pulmonary and extra-pulmonary biochemical and cellular changes and pulmonary structural changes; (c) Contribution to atmospheric discoloration
Sulfur Dioxide	0.04 ppm, 24-hr avg.> 0.25 ppm, 1-hr. avg. >	No Federal 24-hr Standard> 0.075 ppm, 1-hr avg.>	(a) Bronchoconstriction accompanied by symptoms which may include wheezing, shortness of breath and chest tightness, during exercise or physical activity in persons with asthma
Suspended Particulate Matter (PM10)	20 µg/m^3, ann. arithmetic mean > 50 µg/m^3, 24-hr average>	No Federal annual Standard 150 µg/m^3, 24-hr avg.>	(a) Excess deaths from short-term exposures and exacerbation of symptoms in sensitive patients with respiratory disease; (b) Excess seasonal declines in pulmonary function, especially in children
Suspended Particulate Matter (PM2.5)	12 µg/m^3, annual arithmetic mean> No State 24-hr Standard	12 µg/m^3, annual arithmetic mean> 35 µg/m^3, 24-hour average>	Decreased lung function from exposures and exacerbation of symptoms in sensitive patients with respiratory disease; elderly; children.
Sulfates	25 µg/m^3, 24-hr avg. >=	No Federal Standard	(a) Decrease in ventilatory function; (b) Aggravation of asthmatic symptoms; (c) Aggravation of cardio-pulmonary disease; (d) Vegetation damage; (e) Degradation of visibility; (f) Property damage
Lead	1.5 µg/m^3, 30-day avg. >= No State Calendar Quarter Standard No State 3-Month Rolling Avg. Standard	No Federal 30-day avg. Standard 1.5 µg/m^3, calendar quarter> 0.15 µg/m^3 3-Month Rolling average	(a) Increased body burden; (b) Impairment of blood formation and nerve conduction
Visibility-Reducing Particles	In sufficient amount to give an extinction coefficient >0.23 inverse kilometers (visual range to less than 10 miles) with relative humidity less than 70%, 8-hour average (10am – 6pm PST)	No Federal Standard	Visibility based standard, not a health based standard. Nephelometry and AISI Tape Sampler; instrumental measurement on days when relative humidity is less than 70 percent

U.S. EPA requires CARB and Air District to measure the ambient levels of air pollution to determine compliance with the NAAQS. To comply with this mandate, the Air District monitors levels of various criteria pollutants at 27 monitoring stations within the San Francisco Bay Area. A summary of the 2015 maximum concentration and number of days exceeding state and federal ambient air standards at the Air District monitoring stations are presented in Table 3.2-2.

TABLE 3.2-2
Bay Area Air Pollution Summary – 2015

MONITORING STATIONS	OZONE						CARBON MONOXIDE			NITROGEN DIOXIDE				SULFUR DIOXIDE				PM 10				PM 2.5				
	Max 1-hr	Cal 1-hr Days	Max 8-hr	Nat 8-Hr Days	Cal 8-hr Days	3-Yr Avg	Max 1-hr	Max 8-hr	Nat/ Cal Days	Max 1-Hr	Ann Avg	Nat 8-hr Days	Cal 8-hr Days	Max 1-hr	Max 24-hr	Nat 1-Hr Days	Cal 24-hr Days	Ann Avg	Max 24-hr	Nat Days	Cal Days	Max 24-hr	Nat 24-hr Days	3-Yr Avg	Ann Avg	3-Yr Avg
North Counties	(ppb)						(ppm)			(ppb)				(ppb)				(µg/m³)				(µg/m³)				
Napa*	79	0	69	0	0	61	3.3	1.6	0	43	8	0	0	-	-	-	-	18.6	50	0	0	38.2	1	27	10.6	11.4
San Rafael	81	0	70	0	0	61	1.4	0.9	0	44	11	0	0	-	-	-	-	16.1	42	0	0	36.3	2	26	8.6	10.0
Sebastopol*	68	0	62	0	0	*	1.3	0.9	0	37	5	0	0	-	-	-	-	-	-	-	-	29.9	0	*	6.8	*
Vallejo	85	0	70	0	1	61	2.4	1.9	0	44	8	0	0	5	1.7	0	0	-	-	-	-	41.4	3	29	9.6	9.8
Coast/Central Bay																										
Laney College Fwy*	-	-	-	-	-	-	2.7	1.6	0	106	18	1	0	-	-	-	-	-	-	-	-	37.2	1	*	10.0	*
Oakland	94	0	74	2	2	52	2.4	1.4	0	48	11	0	0	-	-	-	-	-	-	-	-	44.7	1	25	8.3	9.1
Oakland-West*	91	0	64	0	0	49	4.7	2.6	0	57	14	0	0	21.6	3.9	0	0	-	-	-	-	38.7	3	29	10.2	10.8
Richmond	-	-	-	-	-	-	-	-	-	-	-	-		-12	2.8	0	0	-	-	-	-	-	-	-	-	-
San Francisco	85	0	67	0	0	48	1.8	1.3	0	71	12	0	0	-	-	-	-	19.2	47	0	0	35.4	0	25	7.6	8.4
San Pablo*	84	0	62	0	0	55	2	1.1	0	46	9	0	0	10.7	2.4	0	0	18.6	43	0	0	33.2	0	27	8.9	10.5
Eastern District																										
Bethel Island	80	0	72	1	2	66	1.1	0.9	0	29	5	0	0	8.8	1.9	0	0	13.6	33	0	0	-	-	-	-	-
Concord	88	0	73	2	4	64	1.4	1.3	0	33	7	0	0	6.7	2	0	0	13.1	24	0	0	31	0	23	8.8	7.7
Crockett	-	-	-	-	-	-	-	-	-	-	-	-	-	-20.5	3.7	0	0	-	-	-	-	-	-	-	-	-
Fairfield	84	0	72	1	1	63	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Livermore	105	1	81	7	7	73	-	-	-	50	10	0	0	-	-	-	-	-	-	-	-	31.1	0	28	8.8	8.2
Martinez	-	-	-	-	-	-	-	-	-	-	-	-	-	14.7	4.8	0	0	-	-	-	-	-	-	-	-	-
Patterson Pass	99	4	82	5	6	*	-	-	-	19	3	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-
San Ramon	106	1	84	6	6	70	-	-	-	37	6	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-
South Central Bay																										
Hayward	103	2	84	2	2	65	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Redwood City	86	0	71	1	1	59	3.4	1.6	0	48	11	0	0	-	-	-	-	-	-	-	-	34.6	0	24	5.7	7.8
Santa Clara Valley																										
Gilroy	95	1	78	3	3	67	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	42.2	2	18	7.2	7.5
Los Gatos	100	1	84	4	5	67	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
San Jose	94	0	81	2	2	63	2.4	1.8	0	49	13	0	0	3.1	1.1	0	0	22	58	0	1	49.4	2	30	10.0	10.2
San Jose Freeway*	-	-	-	-	-	-	2.7	2	0	61	18	0	0	-	-	-	-	-	-	-	-	46.9	1	*	8.4	*
San Martin	98	1	83	4	4	70	-	-	-	-	-	-		-	-	-	-	-	-	-	-	-	-	-	-	-
Total Days over Standard		**7**		**12**	**12**				**0**		**1**	**0**			**0**	**0**				**0**	**1**		**9**			

*Air monitoring at Sebastopol began in January 2014. Therefore, 3-year average statistics for ozone and PM2.5 are not available. The Sebastopol site replaced the Santa Rosa site which closed on December 13, 2013.
Ozone monitoring using the federally accepted method began at Patterson Pass on April 1, 2015. Therefore, 3-year average ozone statistics are not available.
Near-road air monitoring at Laney College Freeway began in February 2014. Therefore, 3-year average PM2.5 statistics are not available.
Near-road air monitoring at San Jose Freeway began in September 2014. Therefore, 3-year average PM2.5 statistics are not available.
(ppb) = parts per billion (ppm) = parts per million, (µg/m³) = micrograms per cubic meter
.

Air quality conditions in the San Francisco Bay Area have improved since the Air District was created in 1955. The long-term trend of ambient concentrations of air pollutants and the number of days on which the region exceeds (AAQS) have generally declined, although some year-to-year variability primarily due to meteorology, causes some short-term increases in the number of exceedance days (see Table 3.2-3). The Air District is in attainment of the State AAQS for CO, NO_2, and SO_2. However, the Air District does not comply with the State 24-hour PM10 standard. The Air District is unclassifiable/attainment for the federal CO, NO_2, SO_2, Pb, and PM10 standards. A designation of unclassifiable/attainment means that EPA has determined to have sufficient evidence to find the area either is attaining or is likely attaining the NAAQS.

The 2015 air quality data from the Air District monitoring stations are presented in Table 3.2-2. No monitoring stations measured an exceedance of any of the state or federal AAQS for CO, SO_2, and Pb. There was one exceedance of the federal NO_2 AAQS at one monitoring station in 2015, although the area did not violate the NAAQS. All monitoring stations were in compliance with the federal PM10 standards. The California 24-hour PM10 standard was exceeded on one day in 2015, at the San Jose monitoring station (see Table 3.2-2).

The Bay Area is designated as a non-attainment area for the federal and state 8-hour ozone standard and the federal 24-hour PM2.5 standard. The state 8-hour ozone standard was exceeded on 12 days in 2015 at one site or more in the Air District; most frequently in the Eastern District (Livermore, Patterson Pass, and San Ramon) (see Table 3.2-2). The federal 8-hour ozone standard was exceeded on 12 days in 2015. The federal 24-hour PM2.5 standard was exceeded at one or more Bay Area station on nine days in 2015, most frequently at the Vallejo and Oakland-West stations.

TABLE 3.2-3

Bay Area Air Quality Summary
Days over Standards

YEAR	OZONE			CARBON MONOXIDE				NOx		SULFUR DIOXIDE		PM10		PM2.5
	8-Hr	1-Hr	8-Hr	1-Hr		8-Hr		1-Hr		1-Hr	24-Hr	24-Hr*		24-Hr
	Nat	Cal	Cal	Nat	Cal	Nat	Cal	Nat	Cal	Nat	Cal	Nat	Cal	Nat
2006	20	18	22	0	0	0	0	1	0	0	0	0	15	10
2007	8	4	9	0	0	0	0	0	0	0	0	0	4	14
2008	19	9	20	0	0	0	0	0	0	2	0	0	5	12
2009	11	11	13	0	0	0	0	0	0	0	0	0	1	11
2010	11	8	11	0	0	0	0	0	0	0	0	0	2	6
2011	9	5	10	0	0	0	0	0	0	0	0	0	3	8
2012	8	3	8	0	0	0	0	1	0	0	0	0	2	3
2013	3	3	3	0	0	0	0	0	0	0	0	0	6	13
2014	9	3	10	0	0	0	0	0	0	0	0	0	2	3
2015	12	7	12	0	0	0	0	1	0	0	0	0	1	9

3.2.1.2 Criteria Pollutant Health Effects

3.2.1.2.1 Ozone

Ozone is not emitted directly from pollution sources. Instead ozone is formed in the atmosphere through complex chemical reactions between hydrocarbons, or reactive organic gases (ROG, also commonly referred to as volatile organic compounds or VOC), and nitrogen oxides (NOx), in the presence of sunlight. ROG and NOx are referred to as ozone precursors.

Ozone, a colorless gas with a sharp odor, is a highly reactive form of oxygen. High ozone concentrations exist naturally in the stratosphere. Some mixing of stratospheric ozone downward through the troposphere to the earth's surface does occur; however, the extent of ozone mixing is limited. At the earth's surface in sites remote from urban areas ozone concentrations are normally very low (0.03-0.05 ppm). While ozone is beneficial in the stratosphere because it filters out skin-cancer-causing ultraviolet radiation, ground level ozone is harmful, is a highly reactive oxidant, which accounts for its damaging effects on human health, plants and materials at the earth's surface.

Ozone is harmful to public health at high concentrations near ground level. Ozone can damage the tissues of the lungs and respiratory tract. High concentrations of ozone irritate the nose, throat, and respiratory system and constrict the airways. Ozone also can aggravate other respiratory conditions such as asthma, bronchitis, and emphysema, causing increased hospital admissions. Repeated exposure to high ozone levels can make people more susceptible to respiratory infection and lung inflammation and permanently damage lung tissue. Ozone can also have negative cardiovascular impacts, including chronic hardening of the arteries and acute triggering of heart attacks. Children are most at risk as they tend to be active and outdoors in the summer when ozone levels are highest. Seniors and people with respiratory illnesses are also especially sensitive to ozone's effects. Even healthy adults can be affected by working or exercising outdoors during high ozone levels.

The propensity of ozone for reacting with organic materials causes it to be damaging to living cells, and ambient ozone concentrations in the Bay Area are occasionally sufficient to cause health effects. Ozone enters the human body primarily through the respiratory tract and causes respiratory irritation and discomfort, makes breathing more difficult during exercise, reducing the respiratory system's ability to remove inhaled particles and fight infection while long-term exposure damages lung tissue. People with respiratory diseases, children, the elderly, and people who exercise heavily are more susceptible to the effects of ozone.

Plants are sensitive to ozone at concentrations well below the health-based standards and ozone is responsible for significant crop damage. Ozone is also responsible for damage to forests and other ecosystems.

3.2.1.2.2 Volatile Organic Compounds (VOCs)

It should be noted that there are no state or national ambient air quality standards for VOCs because they are not classified as criteria pollutants. VOCs are regulated, however, because VOC emissions contribute to the formation of ozone. They are also transformed into organic aerosols in the atmosphere, contributing to higher PM10 and lower visibility levels.

Although health-based standards have not been established for VOCs, health effects can occur from exposures to high concentrations of VOCs because of interference with oxygen uptake. In general, ambient VOC concentrations in the atmosphere are suspected to cause coughing, sneezing, headaches, weakness, laryngitis, and bronchitis, even at low concentrations. Some hydrocarbon components classified as VOC emissions are thought or known to be hazardous. Benzene, for example, one hydrocarbon component of VOC emissions, is known to be a human carcinogen.

VOC emissions result primarily from incomplete fuel combustion and the evaporation of paints, solvents and fuels. Mobile sources are the largest contributors to VOC emissions. Stationary sources include processes that use solvents (such as manufacturing, degreasing, and coating operations) and petroleum refining, and marketing. Area-wide VOC sources include consumer products, pesticides, aerosol and architectural coatings, asphalt paving and roofing, and other evaporative emissions.

3.2.1.2.3 Carbon Monoxide (CO)

CO is a colorless, odorless, relatively inert gas. It is a trace constituent in the unpolluted troposphere, and is produced by both natural processes and human activities. In remote areas far from human habitation, carbon monoxide occurs in the atmosphere at an average background concentration of 0.04 ppm, primarily as a result of natural processes such as forest fires and the oxidation of methane. Global atmospheric mixing of CO from urban and industrial sources creates higher background concentrations (up to 0.20 ppm) near urban areas. The major source of CO in urban areas is incomplete combustion of carbon-containing fuels, mainly gasoline used in mobile sources. Consequently, CO concentrations are generally highest in the vicinity of major concentrations of vehicular traffic.

CO is a primary pollutant, meaning that it is directly emitted into the air, not formed in the atmosphere by chemical reaction of precursors, as is the case with ozone and other secondary pollutants. Ambient concentrations of CO in the District exhibit large spatial and temporal variations, due to variations in the rate at which CO is emitted, and in the meteorological conditions that govern transport and dilution. Unlike ozone, CO tends to reach high concentrations in the fall and winter months. The highest concentrations frequently occur on weekdays at times consistent with rush hour traffic and late night during the coolest, most stable atmospheric portion of the day.

When CO is inhaled in sufficient concentration, it can displace oxygen and bind with the hemoglobin in the blood, reducing the capacity of the blood to carry oxygen. Individuals most at risk from the effects of CO include heart patients, fetuses (unborn babies), smokers, and people who exercise heavily. Normal healthy individuals are affected at higher concentrations, which may cause impairment of manual dexterity, vision, learning ability, and performance of work. The results of studies concerning the combined effects of CO and other pollutants in animals have shown a synergistic effect after exposure to CO and ozone.

3.2.1.2.4 Particulate Matter (PM10 & PM2.5)

Particulate matter, or PM, consists of microscopically small solid particles or liquid droplets suspended in the air. PM can be emitted directly into the air or it can be formed from secondary reactions involving gaseous pollutants that combine in the atmosphere. Particulate pollution is primarily a problem in winter, accumulating when cold, stagnant weather comes into the Bay Area. PM is usually broken down further into two size distributions, PM10 and PM2.5. Of great concern to public health are the particles small enough to be inhaled into the deepest parts of the lung. Respirable particles (particulate matter less than about 10 micrometers in diameter) can accumulate in the respiratory system and aggravate health problems such as asthma, bronchitis and other lung diseases. Children, the elderly, exercising adults, and those suffering from asthma are especially vulnerable to adverse health effects of PM10 and PM2.5.

A consistent correlation between elevated ambient particulate matter (PM10 and PM2.5) levels and an increase in mortality rates, respiratory infections, number and severity of asthma attacks and the number of hospital admissions has been observed in different parts of the United States and various areas around the world. Studies have reported an association between long-term exposure to air pollution dominated by fine particles (PM2.5) and increased mortality, reduction in life-span, and an increased mortality from lung cancer.

Daily fluctuations in fine particulate matter concentration levels have also been related to hospital admissions for acute respiratory conditions, to school and kindergarten absences, to a decrease in respiratory function in normal children and to increased medication use in children and adults with asthma. Studies have also shown lung function growth in children is reduced with long-term exposure to particulate matter. The elderly, people with pre-existing respiratory and/or cardiovascular disease and children appear to be more susceptible to the effects of PM10 and PM2.5.

3.2.1.2.5 Nitrogen Dioxide (NO_2)

NO_2 is a reddish-brown gas with a bleach-like odor. Nitric oxide (NO) is a colorless gas, formed from the nitrogen (N_2) and oxygen (O_2) in air under conditions of high temperature and pressure which are generally present during combustion of fuels; NO reacts rapidly with the oxygen in air to form NO_2. NO_2 is responsible for the brownish tinge of polluted air. The two gases, NO and NO_2, are referred to collectively as nitrogen oxides or NOx. In the presence of sunlight, NO_2 reacts to form nitric oxide and an oxygen atom. The oxygen atom can react further to form ozone, via a complex series of chemical reactions involving hydrocarbons. Nitrogen dioxide may also react to form nitric acid (HNO_3) which reacts further to form nitrates, which are a component of PM10.

NO_2 is a respiratory irritant and reduces resistance to respiratory infection. Children and people with respiratory disease are most susceptible to its effects.

3.2.1.2.6 Sulfur Dioxide (SO_2)

SO_2 is a colorless gas with a sharp odor. It reacts in the air to form sulfuric acid (H_2SO_4), which contributes to acid precipitation, and sulfates, which are a component of PM10 and PM2.5. Most of the SO_2 emitted into the atmosphere is produced by the burning of sulfur-containing fuels.

At sufficiently high concentrations, SO_2 affects breathing and the lungs' defenses, and can aggravate respiratory and cardiovascular diseases. Asthmatics and people with chronic lung disease or cardiovascular disease are most sensitive to its effects. SO_2 also causes plant damage, damage to materials, and acidification of lakes and streams.

3.2.1.3 Current Emissions Inventory

An emission inventory is a detailed estimate of air pollutant emissions from a range of sources in a given area, for a specified time period. Future projected emissions incorporate current levels of control on sources, growth in activity in the Air District and implementation of future programs that affect emissions of air pollutants. Table 3.2-4 shows the inventory of the major sources of particulate matter (including PM10 and PM2.5. Note that many of the stationary source combustion emissions in this table are from petroleum refining operations.

3.2.1.3.1 Ozone

NOx and VOC emissions are decreasing state-wide and in the San Francisco Bay Area since 1975 and are projected to continue to decline. VOC emissions result primarily from incomplete fuel combustion and the evaporation of paints, solvents and fuels. Mobile sources are the largest contributors to VOC emissions. Stationary sources include processes that use solvents (such as manufacturing, degreasing, and coating operations) and petroleum refining, and marketing. Area-wide VOC sources include consumer products, pesticides, aerosol and architectural coatings, asphalt paving and roofing, and other evaporative emissions. About 42 percent of anthropogenic ROG emissions in the Bay Area are from mobile source emissions, while 26 percent are from petroleum and solvent evaporation (BAAQMD, 2017).

TABLE 3.2-4

2011 Air Emission Inventory – Annual Average
(tons per day)

SOURCE CATEGORY	ROG	CO	NOx	SO2	PM10	PM2.5
Petroleum Refining Processes	4.2	1.8	0.5	0.8	0.3	0.2
Other Industrial/Commercial Processes	9.8	0.9	1.7	6.9	10	6
Organic Compounds Evaporation	67.1	0	0	0	0	0
Combustion – Stationary Sources	11	113.8	48.3	10.2	17.9	17.3
Off-Road Mobile Sources	45.2	394.1	75.7	1.3	5.1	5.1
Aircraft	4.1	27.1	12.3	1.1	0.3	0.2
On-Road Motor Vehicles	80.8	773.9	176.6	0.9	13.2	7.2
Miscellaneous	51.2	15	0.5	0.1	58.5	9.5
Total Emissions	**273.4**	**1326.6**	**315.6**	**21.3**	**105.3**	**45.5**

Source: Bay Area Emission Inventory Summary Report: Criteria Air Pollutants (BAAQMD, 2014)

Approximately 84 percent of NOx emissions in the Bay Area are produced by the combustion of fuels. Mobile sources of NOx include motor vehicles, aircraft, trains, ships, recreation boats, industrial and construction equipment, farm equipment, off-road recreational vehicles, and other equipment. NOx and VOC emissions have been reduced for both stationary and mobile sources. Stationary sources of VOC and NOx have been substantially reduced due to stringent District regulations (BAAQMD, 2017).

3.2.1.3.2 Particulate Matter

Particulate matter (both PM10 and PM2.5) is a diverse mixture of suspended particles and liquid droplets (aerosols). PM includes elements such as carbon and metals; compounds such as nitrates, organics, and sulfates; and complex mixtures such as diesel exhaust, wood smoke, and soil. Unlike the other criteria pollutants which are individual chemical compounds, PM includes all particles that are suspended in the air. PM is both directly emitted (referred to as direct PM or primary PM) and also formed in the atmosphere through reactions among different pollutants (this is referred to as indirect or secondary PM).

PM is generally characterized on the basis of particle size. Ultra-fine PM includes particles less than 0.1 microns in diameter. Fine PM (PM2.5) consists of particles 2.5 microns or less in diameter. PM10 consists of particles 10 microns or less in diameter. Total suspended particulates (TSP) includes suspended particles of any size.

Combustion of fossil fuels and biomass, primarily wood, from various sources are the primary contributors of directly-emitted Bay Area PM2.5 (BAAQMD, 2017). Biomass combustion concentrations are about 3-4 times higher in winter than during the other seasons, and its contribution to peak PM2.5 is greater. The increased winter biomass combustion sources reflect increased residential wood-burning during the winter season.

3.2.1.4 Non-Criteria Pollutants Health Effects

Although the primary mandate of the BAAQMD is attaining and maintaining the national and state Ambient Air Quality Standards for criteria pollutants within the BAAQMD jurisdiction, the BAAQMD also has a general responsibility to control, and where possible, reduce public exposure to airborne toxic compounds. TACs are a defined set of airborne pollutants that may pose a present or potential hazard to human health. TACs can be emitted directly and can also be formed in the atmosphere through reactions among different pollutants. The health effects associated with TACs are quite diverse and generally are assessed locally, rather than regionally. TACs can cause long-term health effects such as cancer, birth defects, neurological damage, asthma, bronchitis or genetic damage; or short-term acute affects such as eye watering, respiratory irritation, running nose, throat pain, and headaches. TACs are separated into carcinogens and non-carcinogens based on the nature of the pollutant. Carcinogens are assumed to have no safe threshold below which health impacts would not occur. Non-carcinogenic substances differ in that there is generally assumed to be a safe level of exposure below which no negative health impact is expected to occur. These levels are determined on a pollutant-by-pollutant basis. The air toxics program was established as a separate and complementary program designed to evaluate and reduce adverse health effects resulting from exposure to TACs.

The major elements of the District's air toxics program are outlined below.

- Preconstruction review of new and modified sources for potential health impacts, and the requirement for new/modified sources with TAC emissions that exceed a specified threshold to use BACT.

- The Air Toxics Hot Spots Program, designed to identify industrial and commercial facilities that may result in locally elevated ambient concentrations of TACs, to report significant emissions to the affected public, and to reduce unacceptable health risks.

- Control measures designed to reduce emissions from source categories of TACs, including rules originating from the state Toxic Air Contaminant Act and the federal Clean Air Act.

- The TAC emissions inventory, a database that contains information concerning routine and predictable emissions of TACs from permitted stationary sources.

- Ambient monitoring of TAC concentrations at a number of sites throughout the Bay Area.

3.2.1.4.1 TAC Health Effects

TACs can cause or contribute to a wide range of health effects. Acute (short-term) health effects may include eye and throat irritation. Chronic (long-term) exposure to TACs may cause more severe effects such as neurological damage, hormone disruption, developmental defects, and cancer. CARB has identified roughly 200 TACs, including diesel particulate matter (diesel PM) and environmental tobacco smoke.

Unlike criteria pollutants which are subject to ambient air quality standards, TACs are primarily regulated at the individual emissions source level based on risk assessment. Human outdoor exposure risk associated with an individual air toxic species is calculated as its ground-level concentration multiplied by an established unit risk factor for that air toxic species. Total risk due to TACs is the sum of the individual risks associated with each air toxic species.

Occupational health studies have shown diesel PM to be a lung carcinogen as well as a respiratory irritant. Benzene, present in gasoline vapors and also a byproduct of combustion, has been classified as a human carcinogen and is associated with leukemia. 1,3-butadiene, produced from motor vehicle exhaust and other combustion sources, has also been associated with leukemia. Reducing 1,3-butadiene also has a co-benefit in reducing the air toxic acrolein.

Acetaldehyde and formaldehyde are emitted from fuel combustion and other sources. They are also formed photo-chemically in the atmosphere from other compounds. Both compounds have been found to cause nasal cancers in animal studies and are also associated with skin and respiratory irritation. Human studies for carcinogenic effects of acetaldehyde are sparse but, in combination with animals studies, sufficient to support classification as a probable human carcinogen. Formaldehyde has been associated with nasal sinus cancer and nasopharyngeal cancer, and possibly with leukemia.

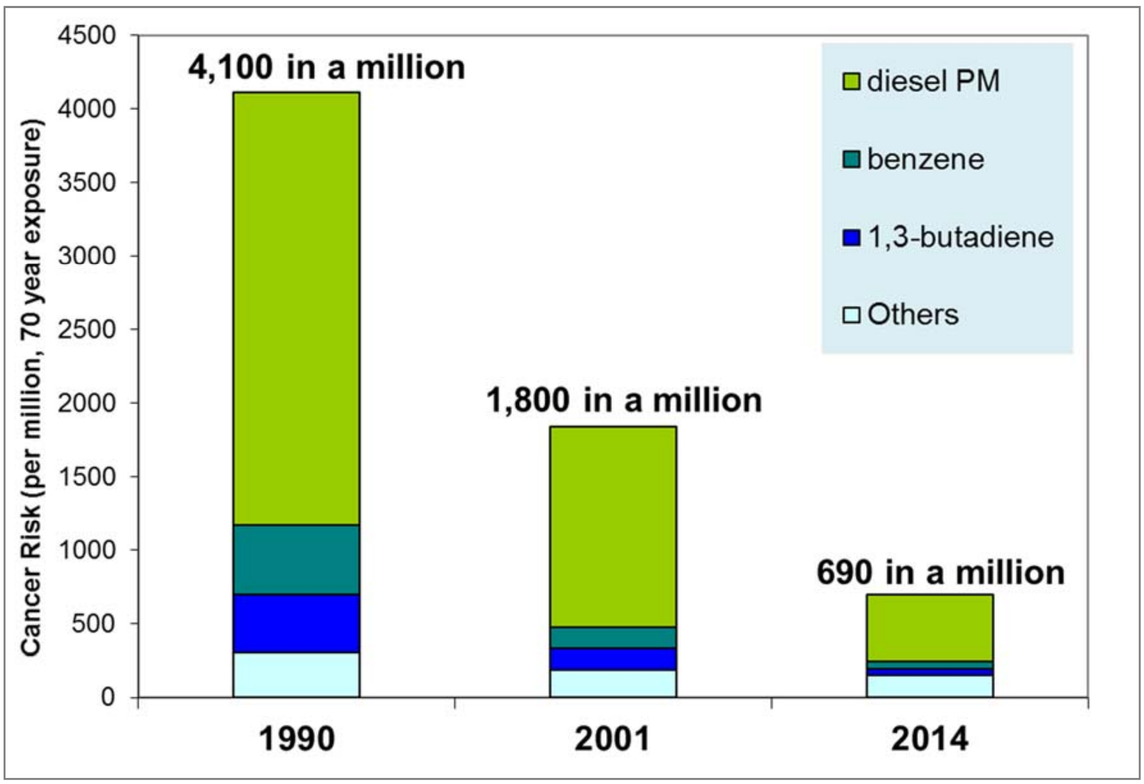
The primary health risk of concern due to exposure to TACs is the risk of contracting cancer. The carcinogenic potential of TACs is a particular public health concern because many scientists currently believe that there are not "safe" levels of exposure to carcinogens without some risk to causing cancer. The proportion of cancer deaths attributable to air pollution has not been estimated using epidemiological methods. Based on ambient air quality monitoring, and using OEHHA cancer risk factors,[1] the estimated lifetime cancer

[1] See CARB's Risk Management Guidance for Stationary Sources of Air Toxics, Discussion Draft, May 27, 2015, https://www.arb.ca.gov/toxics/rma/rma_guidancedraft052715.pdf and the Office Environmental Health Hazard Assessment's toxicity values at http://oehha.ca.gov/media/CPFs042909.pdf. The cancer risk estimates shown in Figure 3.2-1 are higher than the estimates provided in documents such as the Bay Area 2010 Clean Air Plan and the April 2014 CARE report entitled *Improving Air Quality and Health in Bay Area Communities*. It should be emphasized that the higher risk estimates shown in Figure 3.2-1 are due solely to changes in the methodology used to estimate cancer risk, and not to any actual increase in TAC emissions or population exposure to TACs.

risk for Bay Area residents, over a 70-year lifespan from all TACs combined, declined from 4,100 cases per million in 1990 to 690 cases per million people in 2014, as shown in Figure 3.2-1. This represents an 80 percent decrease between 1990 and 2014 (BAAQMD, 2016).

The cancer risk related to diesel PM, which accounts for most of the cancer risk from TACs, has declined substantially over the past 15-20 years as a result of ARB regulations and Air District programs to reduce emissions from diesel engines. However, diesel PM still accounts for roughly 60 percent of the total cancer risk related to TACs.

FIGURE 3.2-1 Cancer-Risk Weighted Toxics Trends



Source: BAAQMD, 2016

3.2.1.4.2 Air Toxics Emission Inventory

The BAAQMD maintains a database that contains information concerning emissions of TACs from permitted stationary sources in the Bay Area. This inventory, and a similar inventory for mobile and area sources compiled by CARB, is used to plan strategies to reduce public exposure to TACs. The detailed emissions inventory is reported in the BAAQMD, Toxic Air Contaminant Control Program, 2010 Annual Report (BAAQMD, 2015). The 2010 emissions inventory continues to show decreasing emissions of many TACs in the Bay Area.

3.2.1.4.3 Ambient Monitoring Network

Table 3.2-5 contains a summary of average ambient concentrations of TACs measured at monitoring stations in the Bay Area by the District in 2015.

TABLE 3.2-5

Summary of 2014 BAAQMD Ambient Air Toxics Monitoring Data

Compound	Max. Conc. (ppb) (1)	Min. Conc. (ppb) (2)	Mean Conc. (ppb) (3)
1,3-Butadiene	0.376	0.000	0.038
Acetaldehyde(4)	5.71	0.42	1.70
Acetone	26.545	0.156	3.922
Acetonitrile	0.314	0.000	0.015
Acrolein(5)	0.060	0.000	0.077
Acrylonitrile	0.060	0.000	0.000
Benzene	1.169	0.000	0.201
Carbon Tetrachloride	0.130	0.066	0.093
Chloroform	0.147	0.000	0.218
Dichloromethane	3.473	0.000	0.076
Ethyl Alcohol	40.046	0.286	5.570
Ethylbenzene	0.979	0.000	0.076
Ethylene Dibromide	0.000	0.000	0.000
Ethylene Dichloride	0.011	0.000	0.000
Formaldehyde(4)	8.12	1.16	2.78
Freon- 113	9.832	0.048	0.147
Methyl Chloroform	3.776	0.000	0.036
Methyl Ethyl Ketone	0.876	0.000	0.253
Tetrachloroethylene	0.712	0.000	0.036
Toluene	4.006	0.000	0.501
Trichloroethylene	6.370	0.000	0.016
Trichlorofluoromethane	1.835	0.090	0.283
Vinyl Chloride	0.000	0.000	0.000
m/p-Xylene	2.788	0.000	0.264
o-Xylene	1.198	0.000	0.099

Source: BAAQMD, 2017

NOTES: Table 3.2-5 summarizes the results of the Air District gaseous toxic air contaminant monitoring network for the year 2015. These data represent monitoring results at 19 separate sites at which samples were collected.

(1) "Maximum Conc." is the highest daily concentration measured at any of the 19 monitoring sites.

(2) "Minimum Conc." is the lowest daily concentration measured at any of the 19 monitoring sites.

(3) "Mean Conc." is the arithmetic average of the air samples collected in 2014 at the 19 monitoring sites.
(4) Acetaldehyde and formaldehyde concentrations reflect measurements from one monitoring site (San Jose-Jackson).
(5) The Air District discontinued measurements of acrolein after May 6, 2016 due to the instability of 2-propenal in cylinders.

3.2.2 EXISTING REGULATORY SETTING

3.2.2.1 Criteria Pollutants

Ambient air quality standards in California are the responsibility of, and have been established by, both the U.S. EPA and CARB. These standards have been set at concentrations, which provide margins of safety for the protection of public health and welfare. Federal and state air quality standards are presented in Table 3.2-1. The federal, state, and local air quality regulations are identified below in further detail.

3.2.2.1.1 Federal Regulations

The U.S. EPA is responsible for setting and enforcing the National Ambient Air Quality Standards for oxidants (ozone), CO, NO_2, SO_2, PM10, PM2.5, and lead. The U.S. EPA has jurisdiction over emissions sources that are under the authority of the federal government including aircraft, locomotives, and emissions sources outside state waters (Outer Continental Shelf). The U.S. EPA also establishes emission standards for vehicles sold in states other than California. Automobiles sold in California must meet the stricter emission requirements of the CARB.

The Clean Air Act (CAA) Amendments of 1990 give the U.S. EPA additional authority to require states to reduce emissions of ozone precursors and particulate matter in non-attainment areas. The amendments set attainment deadlines based on the severity of problems. At the state level, CARB has traditionally established state ambient air quality standards, maintained oversight authority in air quality planning, developed programs for reducing emissions from motor vehicles, developed air emission inventories, collected air quality and meteorological data, and approved state implementation plans. At a local level, California's air districts, including the Air District, are responsible for overseeing stationary source emissions, approving permits, maintaining emission inventories, maintaining air quality stations, overseeing agricultural burning permits, and reviewing air quality-related sections of environmental documents required by CEQA.

Other federal regulations applicable to the Bay Area include Title III of the Clean Air Act, which regulates toxic air contaminants. Title V of the Act establishes a federal permit program for large stationary emission sources. The U.S. EPA also has authority over the Prevention of Significant Deterioration (PSD) program.

3.2.2.1.2 California Regulations

CARB, which became part of the California Environmental Protection Agency in 1991, is responsible for ensuring implementation of the California Clean Air Act and federal Clean Air Act, and for regulating emissions from consumer products and motor vehicles. CARB has established California Ambient Air Quality Standards for all pollutants for which the federal government has established National Ambient Air Quality Standards and also has standards for sulfates, visibility, hydrogen sulfide and vinyl chloride. Federal and state air quality standards are presented in Table 3.2-1 under Air Quality Environmental Setting. California standards are generally more stringent than the National Ambient Air Quality Standards. CARB has established emission standards for vehicles sold in California and for various types of combustion equipment. CARB also sets fuel specifications to reduce vehicular emissions.

CARB released the Proposed 2016 State Strategy for the State Implementation Strategy on May 17, 2016. The measures contained in the State SIP Strategy reflect a combination of state actions, petitions for federal action, and actions for deployment of cleaner technologies in all sectors. CARB's proposed state SIP Strategy includes control measures for on-road vehicles, locomotives, ocean going vessels, and off-road equipment that are aimed at helping all districts in California to comply with federal and state ambient air quality standards.

California gasoline specifications are governed by both state and federal agencies. During the past two decades, federal and state agencies have imposed numerous requirements on the production and sale of gasoline in California. CARB adopted the Reformulated Gasoline Phase III regulations in 1999, which required, among other things, that California phase out the use of MTBE in gasoline. The CARB Reformulated Gasoline Phase III regulations have been amended several times (the most recent amendments were adopted in 2013) since the original adoption by CARB.

The California Clean Air Act (AB2595) mandates achievement of the maximum degree of emission reductions possible from vehicular and other mobile sources in order to attain the state ambient air quality standards by the earliest practical date.

3.2.2.1.3 Air District Regulations

The California Legislature created the Air District in 1955. The Air District is responsible for regulating stationary sources of air pollution in the nine counties that surround San Francisco Bay: Alameda, Contra Costa, Marin, Napa, San Francisco, San Mateo, Santa Clara, southwestern Solano, and southern Sonoma counties. The District is governed by a 24-member Board of Directors composed of publicly-elected officials apportioned according to the population of the represented counties. The Board has the authority to develop and enforce regulations for the control of air pollution within its jurisdiction. The District is responsible for implementing emissions standards and other requirements of federal and state laws. Numerous regulations have been developed by the District to control emissions sources within its jurisdiction. It is also responsible for developing air quality planning documents required by both federal and state laws.

Bay Area facilities are subject to various air quality regulations 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:

- Requiring the use of specific emission control strategies or equipment (e.g., the use of floating roof tanks for VOC emissions);
- Requiring that emissions generated by a source be controlled by at least a specified percentage (e.g., 95 percent control of VOC emissions from pressure relief devices);
- Requiring that emissions from a source not exceed specific concentration levels (e.g., 100 parts per million (ppm) by volume of VOC for equipment leaks, unless those leaks are repaired within a specific timeframe; 250 ppm by volume SO_2 in exhaust gases from sulfur recovery units; 1,000 ppm by volume SO_2 in exhaust gases from catalytic cracking units);
- 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 NOx per million BTU of heat input, on a refinery-wide basis, for boilers, process heaters, and steam generators);
- 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 hydrogen sulfide (H_2S) in the ambient air);
- 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
- 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).
- Requiring that emissions of non-methane organic compounds and methane from the waste decomposition process at solid waste disposal sites be limited.
- Requiring emission limits on precursor organic compounds from valves and flanges as chemical plants.
- Requiring emission limits of nitrogen oxides, particulate matter, and toxic air contaminants from the manufacture of Portland cement.
- Requiring the limitation of emissions of organic compounds from gasoline dispensing facilities.
- Requiring the development of and compliance with Emissions Minimations Plans designed to minimize the fugitive emissions of particulate matter and odorous substances from foundries and forges.

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 but are generally regulated by equipment specific Air District regulations. As a result, none of these facilities have an explicit stated overall mass emission limits that apply to the entire refinery. However, as a practical matter, the refinery's mass emissions are limited by a combination of permit limits, capacity and design of grandfathered sources, and the mechanical layout and design of the refinery. 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. In recent years, emissions of criteria pollutants and greenhouse gasses from refineries have been stable or decreasing.

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.

3.2.2.2 Toxic Air Contaminants

The Air District uses three approaches to reduce TAC emissions and to reduce the health impacts resulting from TAC emissions: 1) Specific rules and regulations; 2) Pre-construction review; and, 3) the Air Toxics Hot Spots Program.

3.2.2.2.1 Rules and Regulations

Many of the TACs emitted by petroleum refineries are also criteria pollutants. For example, benzene and formaldehyde are precursor organic compounds, while arsenic and cadmium can be found in particulate matter. Thus, many regulations that reduce criteria pollutant emissions from refineries will also have a co-benefit of reducing toxic air contaminant emissions. In addition, the Air District implements U.S. EPA, CARB, and Air District rules that specifically target toxic air contaminant emissions from sources at petroleum refineries.

3.2.2.2.2 Preconstruction Review

The Air District's Regulation 2, Rule 5 is a preconstruction review requirement for new and modified sources of TACs implemented through the Air District's permitting process. This rule includes health impact thresholds, which require the use of the best available control technology for TAC emissions (TBACT) for new or modified equipment, and health risk limits cannot be exceeded for any proposed project.

3.2.2.2.3 Air Toxics Hot Spots Program

The Air Toxic Hot Spots program, or AB2588 Program, is a statewide program implemented by each individual air district pursuant to the Air Toxic Hot Spots Act of

1987 (Health and Safety Code Section 44300 et. seq.). The Air District uses standardized procedures to identify health impacts resulting from industrial and commercial facilities and encourage risk reductions at these facilities. Health impacts are expressed in terms of cancer risk and non-cancer hazard index.

Under this program, the Air District uses a prioritization process to identify facilities that warrant further review. This prioritization process uses toxic emissions data, health effects values for TACs, and Air District approved calculation procedures to determine a cancer risk prioritization score and a non-cancer prioritization score for each site. The District updates the prioritization scores annually based on the most recent toxic emissions inventory data for the facility. Facilities that have a cancer risk prioritization score greater than 10 or a non-cancer prioritization greater than 1 must undergo further review. If emission inventory refinements and other screening procedures indicate that prioritizations scores remain above the thresholds, the Air District will require that the facility perform a comprehensive site-wide HRA.

An Air Toxic Hot Spots Act HRA estimates the health impacts from a site due to stationary source emissions. Hot Spots Act HRAs must be conducted in accordance with statewide HRA Guidelines adopted by OEHHA that include health effects values for each TAC and establish the procedures to follow for modeling TAC transport, calculating public exposure, and estimating the resulting health impacts. OEHHA periodically reviews and updates these HRA Guidelines through a scientific review panel and public comment process. The HRA Guidelines were approved in 2003, but OEHHA proposed major revisions to these HRA Guidelines in June 2014. These proposed HRA Guidelines were adopted in March 2015.

In 1990, the Air District Board of Directors adopted the current risk management thresholds pursuant to the Air Toxic "Hot Spots" Act of 1987. These risk management thresholds, which are summarized in Table 3.2-6 below, set health impact levels that require sites to take further action, such as conducting periodic public notifications about the site's health impacts and implementing mandatory risk reduction measures.

TABLE 3.2-6

Summary of Bay Area Air Toxics Hot Spots Program Risk Management Thresholds

Requirement	Site Wide Cancer Risk	Site Wide Non-Cancer Hazard Index
Public Notification	Greater than 10 in one million	Greater than 1
Mandatory Risk Reduction	Greater than 100 in one million	Greater than 10

3.2.2.3 Accidental Release Regulation

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 the 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 facilities (e.g. refineries, cement manufacturing plants, power plants, chemical plants, landfills, sewer treatment facilities, etc.) 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 6, Rule 2: Miscellaneous Operations
- 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 7: Gasoline Dispensing Facilities
- 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 22: Valves and Flanges at Chemical Plants
- Air District Regulation 8, Rule 28: Episodic Releases from Pressure Relief Devices at Petroleum Refineries and Chemical Plants
- Air District Regulation 8, Rule 33: Gasoline Bulk Terminals and Gasoline Delivery Vehicles
- Air District Regulation 8, Rule 34: Solid Waste Disposal Sites

- Air District Regulation 8, Rule 37, Natural Gas and Crude Oil Production Facilities
- Air District Regulation 8, Rule 39: Gasoline Bulk Terminals and Gasoline Delivery Vehicles
- 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 7: Nitrogen Oxides and Carbon Monoxide from Industrial, Institutional, and Commercial Boilers, Steam Generators, and Process HeatersAir 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 9, Rule 11: Nitrogen Oxides And Carbon Monoxide from Utility Electric Power Generating Boilers
- Air District Regulation 9, Rule 13: Nitrogen Oxides, Particulate Matter, and Toxic Air Contaminants from Portland Cement Manufacturing
- Air District Regulation 11, Rule 1: Lead
- Air District Regulation 11, Rule 8: Hexavalent Chromium
- Air District Regulation 12, Rule 11: Flare Monitoring at Petroleum Refineries
- Air District Regulation 12, Rule 12: Flares at Petroleum Refineries
- Air District Regulation 12, Rule 13: Foundry and Forging Operations
- 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)

3.2.3 SIGNIFICANCE CRITERIA

3.2.3.1 Construction Emissions

Regarding construction emissions, the Air District's 1999 Thresholds of Significance did not identify specific significance thresholds for construction emissions. Rather the analysis required that certain control measures be implemented and, if implemented, the air pollutant impacts would be less than significant. The average daily criteria air pollutant and precursor emission levels shown in Table 3.2-7 below are recommended as the thresholds of significance for construction activity for exhaust emissions. These thresholds represent the levels above which a project's individual emissions would result in a considerable contribution (i.e., significant) to the Air Basin's existing non-attainment air quality conditions and thus establish a nexus to regional air quality impacts that satisfies CEQA requirements for evidence-based determinations of significant impacts.

For fugitive dust emissions, staff recommends following the current best management practices approach which has been a pragmatic and effective approach to the control of fugitive dust emissions. Studies have demonstrated (Western Regional Air Partnership, U.S.EPA) that the application of best management practices at construction sites have significantly controlled fugitive dust emissions. Individual measures have been shown to reduce fugitive dust by anywhere from 30 percent to more than 90 percent. In the aggregate best management practices will substantially reduce fugitive dust emissions from construction sites. These studies support staff's recommendation that projects implementing construction best management practices will reduce fugitive dust emissions to a less than significant level.

TABLE 3.2-7

Thresholds of Significance for Construction-Related Criteria Air Pollutants and Precursors

Pollutant/Precursor	Daily Average Emissions (lbs/day)
ROG	54
NOx	54
PM10	82*
PM2.5	54*
PM10/ PM2.5 Fugitive Dust	Best Management Practices

*Applies to construction exhaust emissions only.

3.2.3.2 Operational Emissions

The District's CEQA Guidelines have been developed to assist local jurisdictions and lead agencies in complying with the requirements of CEQA regarding potentially adverse impacts to air quality. The District first developed CEQA guidelines, which included significance thresholds for use by lead agencies, in 1999 (BAAQMD, 1999). The proposed thresholds for project operations are the average daily and maximum annual criteria air pollutant and precursor levels identified in Table 3.2-8 below. These thresholds are based on the federal BAAQMD Offset Requirements to ozone precursors for which the Air Basin is designated as a non-attainment area which is an appropriate approach to prevent further deterioration of ambient air quality and thus has nexus and proportionality to prevention of a regionally cumulative significant impact (e.g. worsened status of nonattainment). These thresholds represent the emission levels above which a project's individual emissions would result in a cumulatively considerable contribution to the Air Basin's existing air quality conditions. The thresholds would be an evaluation of the incremental contribution of a project to a significant cumulative impact. These threshold levels are well-established in terms of existing regulations as promoting review of emissions sources to prevent cumulative deterioration of air quality.

An air quality rule does not fall neatly into any of these categories. Air Quality rules are typically regional in nature, as opposed to general plans, community plans and regional plans. In addition, air quality rules are usually specific to particular source types and particular pollutants. The Air Quality Plan threshold of "no net increase in emissions" is appropriate for Air Quality Plans because they include a mix of several control measures with individual trade-offs. For example, one control measure may result in combustion of methane to reduce greenhouse gas emissions, while increasing criteria pollutant emissions by a small amount. Those increases from the methane measure would be offset by decreases from other measures focused on reducing criteria pollutants. In a particular rule development effort, there may not be opportunities to make these trade-offs.

TABLE 3.2-8

Thresholds of Significance for Operation-Related Criteria Air Pollutants and Precursors

Pollutant/Precursor	Daily Average Emissions (lbs/day)	Maximum Annual Emissions (tons/year)
ROG	54	10
NOx	54	10
PM10	82	15
PM2.5	54	10

*Source: BAAQMD, 2010

3.2.4 ENVIRONMENTAL IMPACTS

Chapter 2 identifies the main types of industrial facilities and their emission sources that would most likely be subject to the risk reduction requirements of Rule 11-18. Similarly, Chapter 2 identifies types of refinery equipment that tend to be the largest sources of emissions that would be subject to Rule 12-16 and that have the greatest potential to contribute to potential exceedances of the facility-wide emissions limits for GHGs, PM2.5, PM10, NOx, and SO_2 emissions. Chapter 2 also identifies air pollution control technologies that would most likely to be installed on the equipment at affected facilities subject to either Rule 11-18 or Rule 12-16 that may require future emissions control.

It is expected that the direct effects of either rule would be reductions in TAC or criteria pollutant emissions. However, construction equipment and activities to install air pollution control equipment has the potential to generate secondary air quality impacts, primarily from exhaust emissions. Further, air pollution control equipment that reduces one or more regulated pollutants has the potential to generate adverse secondary air quality impacts from other sources such as mobile sources or from the air pollution control equipment. For example, some types of air pollution control equipment that use caustic as part of the control process, have the potential to generate emissions of the caustic material that may be considered a TAC.

Potential secondary air quality impacts from construction activities and equipment for both Rule 11-18 and Rule 12-16 are analyzed first. It is assumed in the construction analysis that similar types of construction equipment would be used to install air pollution control equipment regardless of which rule is ultimately adopted. The analysis identifies construction air quality impacts from air pollution control equipment that could be installed to comply with pollution control requirements under both rules (e.g., baghouse, diesel oxidation catalyst, wet gas scrubber, etc.). Other types of air pollution control equipment would be installed only under Rule 11-18 (e.g., thermal oxidizer, carbon adsorption unit, etc.) or only under Rule 12-16 (e.g., SCR, SOx Oxidation Catalyst, etc.). As a result, the analysis of construction air quality impacts includes a range of control technologies that could be installed if either proposed rule is adopted and an analysis of air pollution control technologies that could be installed only under Rule 11-18 or only under Rule 12-16. A discussion then follows comparing construction air quality impacts for each rule individually and if both rules are adopted. Construction and operation air quality impacts are identified and provided in the following subsections.

3.2.4.1 Potential Criteria Pollutant Impacts During Construction

Because there are a wide variety of TACs with different physical or chemical characteristics, different types of control technologies may need to be installed, as necessary, at affected facilities to reduce risk levels to those proposed in Rule 11-18. Similarly, because Rule 12-16 would regulate several different pollutants, GHGs, NOx, SO_2, PM10, PM2.5, different types of control technologies may need to be installed at affected refineries and associated facilities, as necessary, to comply with the annual facility-wide emission limits. The potential secondary adverse air quality impacts from control equipment identified in Chapter 2 that may be installed to comply with either Rule 11-18 or Rule 12-16 have been analyzed in the following subsections.

According to the Staff Report for the proposed rules, Rule 11-18 has the potential to affect hundreds of facilities, including data centers, petroleum refineries, a cement kiln, gasoline dispensing facilities, etc., while Rule 12-16 would regulate five refineries and three associated facilities. Without further analysis of the health risks from facilities that would be subject to Rule 11-18, it is unclear which facilities would be subject to risk reduction requirements or precisely what types of TAC control equipment would be installed. With regard to Rule 12-16, it is not currently known whether any affected facilities would exceed the annual facility-wide emissions limits for the regulated pollutants. Similarly, if the annual facility-wide emissions for GHGs, PM2.5, PM10, NOx, and SO_2 are exceeded it is not known whether operators would limit operations or, alternatively, what types of GHG and criteria pollutant emissions control devices would be installed.

In spite of the uncertainties identified above, the analysis of construction air quality impacts identifies the most likely emissions sources that could contribute to non-compliance with either rule, along with the most appropriate types of air pollution control equipment that would contribute to bringing the affected facility or equipment into compliance with either rule's risk reduction or annual facility-wide pollution control requirements. Likely control technologies are those that are considered to be BACT or BARCT for the emissions sources or are representative air pollution control technologies for the affected industrial sources. Once emissions sources and air pollution control technologies have been identified, the most likely types of construction equipment that would be used to install air pollution control equipment are then identified, construction scenarios are developed, and construction emission impacts are calculated.

Construction equipment associated with installing air pollution control technologies would result in VOC, NOx, SOx, CO, PM10, PM2.5, and GHG emissions, although the amount generated by specific types of equipment can vary greatly as shown in Table 3.2-9. As the table shows, different types of equipment can generate construction emissions in much different quantities depending on the type of equipment. For example, the estimated emissions of NOx range from of 0.1 pound per hour (lb/hr) of NOx for a forklift to 1.81 lbs/hr for scrapers. To provide a conservative construction air quality analysis and in the absence of information on the specific construction activities necessary to complete a construction project, a typical construction analysis assumes that, in the absences of specific information, all construction activities would occur for eight hours per day. This is considered a conservative assumption because workers may need to be briefed on daily activities, so construction may start later than their arrival times or the actual construction activities may not require eight hours to complete. However, for some construction projects, specific types of construction equipment and hours of operation have been developed using analyses prepared for other similar types of construction projects or using construction estimator guidelines used by construction contractors when bidding on jobs. As a result, under some construction scenarios hours of equipment operation may be more or less than eight hours.

A range of construction scenarios for installing various types of control equipment was identified to determine whether or not construction air quality impacts would exceed any applicable air quality significance thresholds. To provide a conservative analysis of potential construction air quality impacts, it is assumed that construction of one or more of the control technologies evaluated in the following subsections could overlap. The following subsections identify construction scenarios that may occur for several control technologies and are considered to be a representative range of construction activities and equipment used to install air pollution control equipment. Construction activities range from installing or retrofitting small-scale air pollution control equipment, which would require few pieces of construction equipment or hours of operation, to installing large-scale air pollution control technologies requiring large construction crews and a large number and types of construction equipment hours of operation. As shown in the following subsections, construction activities could result in substantial construction air quality impacts.

TABLE 3.2-9

Emission Factors Associated with Typical Construction Equipment[(a)]

Equipment Type	VOC (lb/hr)	CO (lb/hr)	NOx (lb/hr)	SOx (lb/hr)	PM (lb/hr)
Aerial Lifts- (Man Lifts)	0.00	0.17	0.10	0.00	0.00
Air Compressor	0.06	0.32	0.43	0.00	0.03
Bore/Drill Rig	0.04	0.50	0.57	0.00	0.02
Concrete Pump	0.01	0.04	0.05	0.00	0.00
Concrete Saw	0.07	0.40	0.43	0.00	0.03
Crane	0.06	0.41	0.80	0.00	0.04
Crane – Rough Terrain (120 hp)	0.07	0.40	0.42	0.00	0.02
Excavator	0.03	0.52	0.35	0.00	0.01
Forklift	0.02	0.22	0.19	0.00	0.01
Generator	0.05	0.28	0.41	0.00	0.22
Grader	0.07	0.58	0.93	0.00	0.04
Pavers	0.04	0.50	0.46	0.00	0.02
Paving Equipment	0.03	0.41	0.37	0.00	0.02
Plate Compactor	0.01	0.03	0.03	0.00	0.00
Rollers	0.03	0.39	0.27	0.00	0.02
Rough Terrain Forklifts	0.02	0.45	0.25	0.00	0.01
Rubber Tired Dozers	0.11	0.88	1.45	0.00	0.07
Rubber Tired Loaders	0.05	0.45	0.67	0.00	0.03
Scrapers	0.12	0.84	1.81	0.00	0.07
Skid Steer Loaders	0.01	0.21	0.16	0.00	0.01
Surfacing Equipment	0.03	0.42	0.52	0.00	0.02
Tractors/Loaders/Backhoes	0.03	0.36	0.31	0.00	0.02
Trenchers	0.05	0.44	0.41	0.00	0.03
Forklifts	0.02	0.22	0.19	0.00	0.01
Welders	0.04	0.19	0.21	0.00	0.02

(a) Emission Factors from Off-Road 2011. CO emissions from SCAQMD, 2006: http://www.aqmd.gov/ceqa/handbook/offroad/offroadEF07_25.xls.

3.2.4.1.1 Diesel ICEs – Both Rules

Installing New Diesel ICEs: Diesel ICEs are often used to provide electricity in areas with no electricity, used as a backup source of electricity in the event of a power outage from numerous types of facilities (e.g. hospitals), or as a means of pumping liquids between different refinery equipment. Over the past several decades, emission limits for diesel ICEs have been established and modified to provide further control of exhaust pollutants. Initial emission limits for diesel ICEs were for engines referred to as Tier 1 ICEs. Diesel ICEs compliant with current emission limits are known as Tier 4 ICEs. Tier 4 ICEs are more efficient than Tier 1 ICEs and emit less pollutants. Replacing Tier I ICEs with Tier 4 ICEs could occur under both rule scenarios.

Construction emissions associated with installing new ICEs would be minor and would involve the transport of the new ICE to the facility and the removal of the existing ICE which is expected to require two one-way truck trips. In this situation, construction would likely require one light-heavy-duty truck trip to deliver new ICEs and one trip to haul away the old ICE, a construction crew of five workers, one forklift, one generator set, one welder, and hand tools (Table 3.2-10). It is also expected that replacement would take one day or less.

TABLE 3.2-10

Construction Equipment Used to Install a Tier 4 ICE

Off- Road Equipment Type	Number	Daily Hours of Use
Forklift	1	2
Generator	1	4
Welder	1	4

Source: Based on SCAQMD, 2008. Assumptions modified for this analysis because it is assumed that one ICE unit would replace the existing ICE, instead of constructing the new ICE unit.

Table 3.2-11 shows construction emissions from installing one Tier 4 ICE. It is possible that more than one Tier 4 ICE could be installed on the same day under both rule scenarios, resulting in overlapping construction emissions, which are also shown in Table 3.2-11. It is assumed that more Tier 4 ICEs would be installed under Rule 11-18 because it regulates substantially more facilities than Rule 12-16 and, for a large number of these facilities, existing diesel ICEs are the main risk drivers. Therefore, based on the numbers of facilities subject to each rule and the uncertainties regarding the need to reduce health risks or reduce annual facility-wide emissions, the assumptions that 10 Tier 4 ICEs would be installed on the same day under Rule 11-18 and five would be installed under Rule 12-16 are likely conservative assumptions for the following reasons. According to the staff report for the proposed project, if adopted, Rule 11-18 would require preparation of new, or revisions to existing HRAs at affected facilities using OEHHA's 2015 HRA Guideline Revisions. Depending on the complexity of facility operations and the number of TAC emissions sources that would be subject to Rule 11-18, preparation of new or revisions to existing HRAs would likely be completed, evaluated, and approved over different time periods. However, because hundreds of facilities could be affected by implementing Rule 11-18 and many of these sources have ICEs, it is reasonable to assume that up to 10 ICEs would be replaced on a single day. Similarly, refineries and associated facilities that would be subject to Rule 12-16 may use a relatively large number of ICEs to provide electricity or pump product in remote areas of the facility that are not served by electricity. According to the Staff Report for the proposed project, the facility-wide emissions limits under Rule 12-16 do not currently appear to inhibit refining capacity, since typical annual average utilization is 80 – 87 percent, and the emissions limits appear to establish production capacity limits at approximately 89 – 93 percent utilization. If control of GHGs, NOx, SO_2, PM10, PM2.5 emissions at affected facilities in the future does become necessary, because operations can vary substantially between the affected facilities, the decision to replace existing Tier 1 ICEs with Tier 4 ICEs would not occur at the same time. Therefore, it is reasonable to assume that fewer ICEs, up to five, would be replaced on the same day.

TABLE 3.2-11

Construction Emissions from Installing a Tier 4 ICE

	Pollutant					
	ROG	**CO**	**NOx**	**SOx**	**PM10**	**PM2.5**
	ICE Replacement (lbs/day)					
Sub-total Off-road Construction Equipment	0.4	2.32	2.86	< 1.0	0.98	0.98
Sub-total On-road (Worker + Haul Truck) (1)	0.48	2.41	1.91	0.01	0.04	0.02
Total - 1 ICE Replacement	0.88	4.73	4.77	0.005	1.02	1.00
Rule 11-18 - 10 Replacements	8.8	47.3	47.7	0.1	10.2	10.0
Rule 12-16 - 5 Replacements	4.4	23.7	23.8	0.0	5.1	5.0
Both Rules - 15 Replacements	13.1	71.0	71.5	0.1	15.3	15.0
	ICE Replacement (tons/day)					
Both Rules - 15 Replacements	0.007	0.035	0.036	<0.000	0.008	0.008

(1) It is assumed that trucks are diesel light-heavy-duty trucks make two one-way trips of 20 miles. See Appendix B for calculation details.

Retrofitting Diesel ICEs: A potential alternative to installing a new diesel ICE is to retrofit an existing engine with a DPF or DOC. This scenario is potentially a less costly means of reducing diesel ICE emissions or may be preferable if only minor emission or risk reductions measures are necessary. Retrofitting an existing ICE with a DPF or DOC would require one forklift and a crew of four, primarily using hand tools, and would take one day to complete. One two-way truck trip would be necessary to deliver the control equipment to the affected facility. Construction air quality impacts from retrofitting diesel ICEs are shown in Table 3.2-12.

TABLE 3.2-12

Construction Emissions for Retrofitting Diesel ICEs

	Pollutants					
	ROG	CO	NOx	SOx	PM10	PM2.5
	ICE Retrofits (lbs/day)					
Sub-total Off-road Construction Equip	0.08	0.88	0.76	< 1.0	0.04	0.04
Sub-total On-road (Worker + Haul Truck) (1)	0.19	0.40	1.30	0.00	0.04	0.02
Total - 1 ICE Retrofit	0.27	1.28	2.06	0.00	0.08	0.06
Rule 11-18 - 10 Retrofits	2.74	12.78	20.58	0.02	0.80	0.57
Rule 12-16 - 5 Retrofits	0.27	1.28	10.29	0.00	0.08	0.06
Both Rules - 15 Retrofits	4.11	19.17	30.86	0.03	1.20	0.86
	ICE Retrofits (tons/day)					
Both Rules - 15 Retrofits	0.002	0.01	0.02	<0.000	<0.001	<0.001

Reference: SCAQMD 2008.

(1) It is assumed that trucks are diesel light-heavy-duty trucks and make two one-way trips of 20 miles and idle for 60 minutes. See Appendix B for calculation details.

It is possible that more than one diesel ICE could be retrofitted on the same day under both rule scenarios, resulting in overlapping construction emissions such as those shown in Table 3.2-12. Based on the uncertainties regarding the need to reduce health risks or reduce annual facility-wide emissions, the same assumptions for installing Tier 4 ICEs were used in this analysis of retrofitting diesel ICEs, that is, 10 ICEs would be retrofitted on the same day under Rule 11-18 and five would be retrofitted under Rule 12-16. As indicated above, these assumptions are likely conservative assumptions for the following reasons. According to the staff report, if adopted, Rule 11-18 would require preparation of new, or revisions to existing HRAs at affected facilities using OEHHA's 2015 HRA Guideline Revisions. Depending on the complexity of facility operations and the number of TAC emissions sources that would be subject to Rule 11-18, preparation of new or revisions to existing HRAs would likely be completed, evaluated, and approved over different time periods. However, because hundreds of facilities could be affected by implementing Rule 11-18 and many of these sources have ICEs, it is reasonable to assume that up to 10 diesel ICEs would be retrofitted on a single day.

Similarly, refineries and associated facilities that would be subject to Rule 12-16 may use many ICEs to provide electricity or pump product in remote areas of the facility that are not served by electricity. According to the Staff Report for the proposed project, the facility-wide emissions limits under Rule 12-16 do not currently appear to inhibit refining capacity, since typical annual average utilization is 80 – 87 percent, and the emissions limits appear to establish production capacity limits at approximately 89 – 93 percent utilization. If control of GHGs, NOx, SO_2, PM10, PM2.5 emissions at affected facilities in the future does become necessary, because operations can vary substantially between the affected facilities, the decision to retrofit existing diesel ICEs to comply with Tier 4

ICE standards would not occur at the same time. Therefore, it is reasonable to assume that fewer ICEs, up to five, would be retrofitted on the same day.

3.2.4.1.2 Installing a Wet Gas Scrubber – Both Rules

In an evaluation of the various construction scenarios related to installing air pollution control equipment, it was concluded that installing a WGS would require more demolition and construction equipment and activities than installing other types of control technologies and, therefore, would provide a "worst-case" construction air quality analysis. Because of its large size, it is expected that installing a WGS would occur over a 17-month period; one month to demolish any nearby existing equipment or structures and 16 months to construct the WGS, which would include: site preparation, assembly and installation of the unit and ancillary support equipment, and tying-in the new WGS to the affected equipment.

The following analysis of the construction impacts associated with installing a WGS is based on an EIR prepared for the installation of a WGS on an FCCU in southern California (SCAQMD, 2007). These construction emission estimates are appropriate for the construction air quality analysis for the proposed rules because they are based on the construction equipment for the use of one WGS on one refinery FCCU. Both rules have the potential to require installation of a WGS because it can reduce TAC and criteria pollutant (SOx and PM2.5) emissions. Regardless of the location of the construction activities, the amount or types of construction equipment and hours of operation, these parameters would not be expected to change compared to the 2007 analysis. The analysis uses a conservative assumption that equipment would operate for 10 hours per day because the 2007 project was on an aggressive installation schedule. The construction equipment that would most likely be required for the installation of a refinery WGS, for example, during a peak month is provided in Table 3.2-13.

Because of its large size, construction of one WGS would likely require as many as 175 construction workers and, using worst-case assumptions, it is assumed that constructing a WGS would require the use of one or more of the following types of construction equipment: backhoes, cranes, man lifts, forklift, front end loaders generators, diesel welding machines, jack hammers, a medium-duty flatbed truck, a medium-duty dump truck, and a cement mixer. Other sources of construction emissions could include: equipment delivery, on-site travel (would include fugitive dust associated with travel on paved roads, and fugitive dust associated with construction activities), and construction worker commute trips.

Depending on the size and types of equipment or structures that may need to be demolished, a worst-case assumption is that up to 50 construction workers would be required. Demolition activities are assumed to require the use of: one or more of the following types of equipment: crane, front-end loader, forklift, demolition hammer, water truck, and medium-duty flatbed truck. Other sources of demolition emissions could include haul truck trips to dispose of demolition debris, on-site travel (would include fugitive dust associated with travel on paved roads, fugitive dust associated with demolition activities), and construction worker commute trips.

TABLE 3.2-13

Estimated Peak Day Off-Road Construction Emissions from Installing One Refinery Wet Gas Scrubber

Off- Road Equipment Type	Number	Daily Hours of Use
Backhoe	1	10
Crane	2	10
Crane	1	10
Front End Loader	1	10
Man Lift	3	10
Forklift	2	10
Generator	1	10
Demolition Hammer	1	10
Welder	3	10

Reference: SCAQMD 2007

Construction and demolition emission estimates for activities associated with installing one WGS are provided in Table 3.2-14. It is assumed that the proposed project has the potential to result in the construction of up to three to five WGS units under Rule 11-18 or three to five units under Rule 12-16. If both rules are adopted, it is assumed that operators at affected facilities would install a single WGS to control both TAC and SOx emissions, which means that the assumption that three to five WGS units would be installed concurrently is still applicable. Typically, construction activities occur sequentially, that is, demolition must be completed before construction activities begin. To provide a conservative analysis, demolition and construction activities are assumed to overlap. Construction estimates associated with constructing one WGS unit, three WGS units, and five WGS units are shown in Table 3.2-14

The assumption that constructing three to five WGS units could occur under Rule 11-18 is likely a conservative assumptions for the following reasons. According to the staff report, if adopted, Rule 11-18 would require preparation of new, or revisions to existing HRAs at affected facilities using OEHHA's 2015 HRA Guideline Revisions. Depending on the complexity of facility operations and the number of TAC emissions sources, preparation of new, or revisions to existing HRAs would likely be completed, evaluated, and approved over different time periods. If it is determined that affected facilities exceed the health risk requirements in Rule 11-18 and a decision is made to install a WGS, then it would likely take months or years to provide engineering specifications, acquire financing, purchase and deliver the necessary equipment, complete Air District permit evaluations, and undergo any necessary environmental analyses.

TABLE 3.2-14

Estimated Construction Emissions for Wet Gas Scrubbers

ACTIVITY	CO	ROG	NOx	SOx	PM10	PM2.5
Construction Emissions from one WGS on Refinery Units[1] (lbs/day)						
Demolition for 1 WGS at Refinery[1]	36	6	28	<1	3	2
Construction Activities for 1 Refinery WGS[1]	67	17	84	<1	39	23
Total Construction Estimates for one WGS on Refinery Units (tons emitted during construction period)						
Demolition for 1 WGS at Refinery[2]	0.36	0.06	0.28	<0.1	0.03	0.02
Construction Activities for 1 WGS at Refinery[3]	8.04	2.04	10.08	<0.1	4.68	2.76
Total Construction Emissions per each WGS[3]	8.4	2.1	10.4	<0.1	4.7	2.8
Construction Emissions for 3 and 5 Large WGS (tons) on Refinery Units (tons emitted during construction period)						
Total Construction Emissions 3 WGS Units	25.2	6.3	31.2	<1	14.1	8.4
Total Construction Emissions 5 WGS Units	42	10.5	52	<1	23.5	14

(1) Reference: SCAQMD 2007

(2) Demolition activities include off-road construction equipment and on-road mobile source emissions and are estimated to occur for one month (20 working days)

(3) Construction activities include off-road construction equipment and on-road mobile source emissions and are estimated to occur for a total of 16 months (20 working days per month), with 8 months at peak construction activities and 8 months at 50 percent of peak construction activities.

The assumption that three to five WGS units could be constructed at the same time under Rule 12-16 is considered to be a conservative assumption for the following reasons. According to the Staff Report for the proposed project, the facility-wide emissions limits do not currently appear to inhibit refining capacity, since typical annual average utilization is 80 – 87 percent, and the emissions limits appear to establish production capacity limits at approximately 89 – 93 percent utilization. That is, the annual emissions caps in Rule 12-16 appear to be consistent with the current maximum production capability of the refineries so additional control equipment is currently unnecessary. However, the trend in fuel consumption since 2012 has been toward increasing consumption. It is possible that in future years, refinery operators may want to increase refinery capacity within current permit limitations, so air pollution control equipment including WGS units may need to be installed. As noted in the paragraph above, from the concept stage to completing construction of a WGS could take months or years, which further reduces the probability of constructing three or more WGS units at the same time.

3.2.4.1.3 Installing a Selective Catalytic Reduction Unit – Rule 12-16 Only

An analysis of construction emissions to install an SCR unit is included here because it would apply only to Rule 12-16 and is a large unit that would require substantial construction activities. SCR is typically considered to be BACT or BARCT to reduce NOx emissions from large industrial combustion sources. Combustion sources at affected facilities that could be retrofitted with SCR include refinery FCCUs, boilers, process heaters, or gas turbines. The construction period duration necessary for installing an SCR depends primarily on the type of equipment being retrofitted. For example, retrofitting a refinery FCCU with SCR would occur over approximately 12 to 13 months, require a total of 260 days of construction, and use a crew of 140 construction workers during peak construction periods. SCRs could also be retrofitted onto refinery boilers, process heaters, or gas turbines. However, such units are typically smaller compared to retrofitting an SCR onto an FCCU, so construction crews would be smaller and the overall duration of construction activities would be much shorter. Because retrofitting an SCR onto an FCCU would provide a more conservative analysis of construction air quality impacts than retrofitting an SCR onto refinery boilers, process heaters, or gas turbines, the following analysis focuses on quantifying construction emissions from retrofitting an SCR onto an FCCU.

The following analysis of the construction air quality impacts associated with installing SCRs on refinery FCCUs is based on an environmental analysis of the effects of further limiting NOx emissions at southern California refineries (SCAQMD, 2015a). These construction emission estimates are appropriate for the construction air quality analysis for Rule 12-16 because they are based on the construction equipment assumed to be associated with a permit application for the use of a SCR on refinery FCCUs. Regardless of the location of the construction activities, the amount or types of construction equipment and hours of operation, these parameters would not be expected to change. The construction equipment that would most likely be required for installing an SCR on one refinery FCCU during a peak month is provided in Table 3.2-15.

The construction emission estimates for activities associated with installing one SCR on a refinery FCCU are provided in Table 3.2-16. Major demolition activities are not expected to be necessary to install an SCR because these units are constructed directly next to or on to the emissions sources' exhaust stacks. It is possible that more than one SCR could be constructed at the same time resulting in overlapping construction emissions such as those shown in Table 3.2-16. Therefore, it is conservatively assumed here that Rule 12-16 has the potential to result in the construction of up to three SCR units on refinery FCCUs. Emission estimates for installing up to three SCR units on refinery FCCUs are also shown in Table 3.2-16. As noted above, retrofitting refinery boilers, process heaters, and gas turbines with SCRs would generate lower construction emissions than shown in Table 3.2-16 because the SCR units would be smaller in scale compared to those installed onto an FCCU.

TABLE 3.2-15

Estimated Peak Day Off-Road Construction Emissions from Installing One SCR on One FCCU

Off- Road Equipment Type	FCCU SCR Unit Number	FCCU SCR Unit Daily Hours of Use
Air Compressor	1	8
Backhoe	1	8
Concrete Pump	1	2
Concrete Saw	1	2
Crane	2	10
Forklift	1	6
Generator	2	8
Man Lift	2	2
Plate Compactor	1	2
Welder	5	8

Source: SCAQMD, 2015a

TABLE 3.2-16

Estimated Construction Emissions for an SCR Unit on A Refinery FCCU[(a)]

ACTIVITY	ROG	CO	NOx	SOx	PM10	PM2.5
Peak Construction Emissions One SCR Unit (lbs/day)						
Construction Activities for 1 FCCU SCR [(1)]	1.86	12.02	14.94	0	4.12	3.79
Total Construction On-road Vehicle Trips [(2)]	5.22	8.58	8.60	0.71	0.47	0.22
Total Construction emissions	7.08	20.60	23.54	0.71	4.59	4.01
Total Construction Emissions for One SCR Unit (tons emitted during construction period)						
Construction Activities for 1 FCCU SCR [(1)]	0.69	3.18	3.75	0.07	0.85	0.76
Total Construction Emissions for 3 SCR Units (tons emitted during construction period)						
Construction Activities for 3 FCCU SCR	2.07	9.54	11.25	0.21	2.55	2.28

Reference: SCAQMD 2015

(1) Construction activities are estimated to occur for a total of 12 months (20 working days per month), with 6 months at peak construction activities and 6 months at 50 percent of peak construction activities.

(2) Vehicle trip assumptions include average vehicle ridership of 1.0 and a trip length of 11 miles one way (CAPCOA, 2016).

It is possible that more than one SCR could be constructed at the same time. However, the assumption that up to three SCR units could be constructed at the same time to control NOx emissions from refinery FCCUs may be a conservative assumption for the following reasons. According to the Staff Report for the proposed project, the facility-wide emissions limits do not appear to inhibit refining capacity, since typical annual average utilization is 80 – 87 percent, and the emissions limits appear to establish production capacity limits at approximately 89 – 93 percent utilization. That is, the caps in Rule 12-16 appear to be consistent with the current maximum production capability of the refineries so additional control equipment is currently unnecessary. However, the trend in fuel consumption since 2012 has been toward increasing consumption. It is possible that in future years, refinery operators may want to increase refinery capacity within current permit limitations, so air pollution control equipment including SCR units may need to be installed. Finally, from concept to completing construction of an SCR unit could take months or years, which further reduces the probability of constructing three to multiple SCR units at the same time.

3.2.4.1.4 Installing a Carbon Adsorption Unit – Rule 11-18 Only

The most likely TAC emission sources that would be subject to Rule 11-18 and that could be controlled using carbon adsorption units are expected to be sewage treatment facilities because various stages of the sewage treatment process produce ROG emissions that may include TAC components. A survey of wastewater treatment facilities in the Bay Area indicated that there are at least 20 facilities ranging in size from a discharge rate of 0.1 to greater 30 million gallons per day (Pacific Institute, 2009)[2].

The construction analysis for installing a carbon adsorption unit is based on a construction emissions analysis from installing air pollution control equipment similar in size to a carbon adsorption unit because no actual carbon adsorption construction scenarios were identified. Construction parameters associated with installing a carbon adsorption unit would occur over a timeframe of approximately six to seven months, requiring a total of 130 days of construction and using a crew of 20 construction workers. Table 3.2-17 shows the types of construction equipment and their hours of operation anticipated to be need to install one carbon adsorption unit.

[2] This number underestimates the total number of wastewater treatment facilities because it only refers to facilities that may be affected a 100-year coastal flood or a 1.4 meter rise in sea level. It does not include, for example, the three wastewater treatment facilities in the City of San Francisco. This information is provided only to show that a relatively large number of carbon adsorption units could be installed as a result of adopting Rule 11-18.

TABLE 3.2-17

Estimated Peak Day Off-Road Construction Emissions from Installing One Carbon Adsorption Unit

	Carbon Adsorption Unit	
Off- Road Equipment Type	**Number**	**Daily Hours of Use**
Backhoe	1	4
Rough Terrane Crane	1	8
Welder	2	8
Air Compressor	1	4
Plate Compactor	1	4
Forklift	1	3
Concrete Pump	1	2
Concrete Saw	1	2
Generator	1	8
Man Lift	1	2

Construction emission estimates for activities associated with installing one carbon adsorption unit are provided in Table 3.2-18. Major demolition activities are not expected to be necessary to install a carbon adsorption unit because the units are relatively compact. It is possible that more than one carbon adsorption unit could be constructed at the same time resulting in overlapping construction emissions such as those shown in Table 3.2-18. Therefore, it is conservatively assumed here that Rule 11-18 has the potential to result in the construction of up to five carbon adsorption units at sewage treatment facilities. Emission estimates of installing up to five carbon adsorption units are also shown in Table 3.2-18.

The assumption that construction of five carbon adsorption units could occur under Rule 11-18 is likely a conservative for the following reasons. According to the staff report, if adopted, Rule 11-18 would require preparation of new, or revisions to existing HRAs at affected facilities using OEHHA's 2015 HRA Guideline Revisions. Depending on the complexity of facility operations and the number of TAC emissions sources, preparation of new, or revisions to existing HRAs would likely be completed, evaluated, and approved over different time periods. If it is determined that affected facilities, primarily sewage treatment facilities, exceed the health risk requirements in Rule 11-18 and a decision is made to install a carbon adsorption unit, then it would likely take months, possibly years, to provide engineering specifications, acquire financing, purchase and deliver the necessary equipment, complete Air District permit evaluations, and undergo any necessary environmental analyses.

TABLE 3.2-18

Estimated Construction Emissions for a Carbon Adsorption Unit

ACTIVITY	ROG	CO	NOx	SOx	PM10	PM2.5
Peak Construction Emissions One Carbon Adsorption Unit (lbs/day)						
Subtotal Construction Activities for 1 Unit	2.34	9.76	14.85	0.00	2.14	1.97
Sub-total On-road (Worker + Haul Truck) (1)	0.93	1.08	1.68	0.01	0.08	0.04
Total Construction emissions	3.27	10.84	16.53	0.01	2.22	2.01
Total Construction Emissions for One Carbon Adsorption Unit (tons emitted during construction period)						
Construction Activities for 1 Unit (2)	0.16	0.53	0.81	0.00	0.11	0.10
Total Construction Emissions for 5 Carbon Adsorption Units (tons emitted during construction period)						
Construction Activities for 5 Units	0.80	2.64	4.03	0.00	0.54	0.49

(1) Vehicle trip assumptions include average vehicle ridership of 1.0 and a trip length of 11 miles one way (CAPCOA, 2016).

(2) Construction activities are estimated to occur for a total of 6 to 7 months (130 working days total) with a 20-person work crew.

3.2.4.1.4 Summary of Construction Emission Impacts

As demonstrated in the subsections above, construction and installation of some types of air pollution control technologies would not necessarily be expected to result in significant adverse construction air quality impacts. For example, replacing existing diesel ICEs with Tier 4 ICEs or retrofitting diesel ICEs with DPFs of DOCs could occur if either Rule 11-18 or Rule 12-16 is adopted. For either control scenario, emissions would be relatively low and would only be expected to occur on a single day. As shown in Tables 3.2-11 and 3.2-12, construction air quality impacts from installing new, or retrofitting existing diesel ICEs would be greater under Rule 11-18 than under Rule 12-16 because substantially more industrial facilities that have diesel ICEs would be regulated under Rule 11-18. Construction air quality impacts would be greater still if more than one diesel ICE is replaced or retrofitted on the same day or both rules are adopted.

As summarized in Tables 3.2-19 and 3.2-20, Rule 11-18 and Rule 12-16, respectively, could produce substantial construction air quality impacts if larger types of air pollution control equipment are installed. This impact would be compounded if more than one piece of air pollution control equipment is installed on the same day or both rules are adopted. Again, because Rule 11-18 would potentially regulate a substantially greater number of industrial sources, it would create greater air quality impacts than Rule 12-16.

TABLE 3.2-19

Worst-Case Construction Emissions Under Rule 11-18

ACTIVITY	ROG	CO	NOx	SOx	PM10	PM2.5
Peak Construction Emissions Per Unit Under Rule 11-18 (lbs/day)						
Diesel ICE Replacements 1 ICEs	0.88	4.73	4.77	0.005	1.02	1.00
Diesel ICE Retrofits 1 ICEs	0.27	1.28	2.06	<0.01	0.08	0.06
Total for 1 WGS (1)	17	67	84	<1.0	39	23
Total for 1 Carbon Adsorption	3.27	10.84	16.53	0.01	2.22	2.01
Total Potential Overlapping Emissions	21.4	83.9	107.4	0.0	42.3	26.1
Significance Thresholds	54	None	54	None	82	54
Significant?	No	--	**Yes**	--	No	No
Total Construction Emissions for 1 Unit for Both Types of Control Equipment (tons emitted during construction period)						
Total Construction Emissions for 1 WGS	2.1	8.4	10.4	<0.1	4.7	2.8
Total for 1 Carbon Adsorption Unit	0.16	0.53	0.81	0.00	0.11	0.10
Total Potential Overlapping Emissions	2.26	8.97	11.21	<1.0	4.81	3.1
Total Construction Emissions for 5 Units for Both Types of Control Equipment (tons emitted during construction period)						
Total for 5 WGS Units	10.5	42	52	<1.0	23.5	14
Total for 5 Carbon Adsorption Unit	0.8	2.7	4.0	<1.0	0.5	0.5
Total Potential Overlapping Emissions	11.3	44.7	56.0	<1.0	24.0	14.5

(1) Reference: SCAQMD 2007

TABLE 3.2-20

Worst-Case Construction Emissions Under Rule 12-16

ACTIVITY	ROG	CO	NOx	SOx	PM10	PM2.5
Peak Construction Emissions Per Unit Under Rule 12-16 (lbs/day)						
Diesel ICE Replacements 1 ICEs	0.88	4.73	4.77	0.005	1.02	1.00
Diesel ICE Retrofits 1 ICE	0.27	1.28	2.06	<0.01	0.08	0.06
Total Construction Emissions for 1 WGS (1)	17	67	84	<1.0	39	23
Total Construction Emissions for 1 SCR	7.08	20.60	23.54	0.71	4.59	4.01
Total Potential Overlapping Emissions	25.23	93.61	114.37	0.72	44.69	28.07
Significance Thresholds	54	None	54	None	82	54
Significant?	No	--	**Yes**	--	No	No
Total Construction Emissions for 1 Unit for Both Types of Control Equipment (tons emitted during construction period)						
Total for 1 WGS	2.1	8.4	10.4	<0.1	4.7	2.8
Total for 1 SCR	0.69	3.18	3.75	0.07	0.85	0.76
Total Potential Overlapping Emissions	2.79	11.58	14.15	<0.1	5.55	3.56
Total Construction Emissions for 5 WGS and 3 SCR Units (tons emitted during construction period)						
Total for 5 WGS Units	10.5	42	52	<1.0	23.5	14
Total for 3 SCRs	2.07	9.54	11.25	0.21	2.55	2.28
Total Potential Overlapping Emissions	12.6	51.5	63.3	<1.0	24.1	16.3

(1) Reference: SCAQMD 2007

Conclusion: Based on the construction emissions shown for each rule in Tables 3.2-19 and 3.2-20, it is concluded that NOx construction air quality impacts may be significant under either rule scenario and potentially more significant if both rules are adopted. ROG, PM10, and PM2.5 construction emissions are less the applicable significance threshold and, therefore, are concluded to be less than significant. Construction emissions, however, are temporary as construction emissions would cease following completion of construction activities.

3.2.4.2 Potential Criteria Pollutant Impacts During Operation

The net effect of implementing Rule 11-18 is to reduce cancer and non-cancer health risks by reducing TAC emissions from regulated sources. Similarly, Regulation 12-16 would be expected to reduce NOx, SO_2, PM10, and PM2.5, emissions from five refineries and three associated facilities, thus, contributing to improvements to local air quality. However, some control technologies have the potential to generate secondary or indirect air quality impacts as part of the control process. Table 3.2-21 lists all the identified air pollution control technologies that may be used to comply with future regulatory requirements under either Rule 11-18, Rule 12-16, or both, as well as potential secondary or indirect operational air quality impacts associated with some types of air pollution control technologies. Those air pollution control technologies in Table 3.2-21 where no direct or indirect operational air quality impacts were identified are not discussed further. The remaining air pollution control technologies that have the potential to generate secondary or indirect operational air quality impacts, will be evaluated further in the following subsections.

The following analyses of potential operational secondary air quality impacts from the proposed project include the following assumption; it is assumed that no additional employees would be needed to operate any new or modified air pollution control equipment, so the existing work force at each affected facility is expected to be sufficient. As such, no workers' commute trip emissions are anticipated for the operation of the new or modified air pollution control equipment.

TABLE 3.2-21

Potential Operational Air Quality Impacts from Installing Air Pollution Control Equipment

Applicable Rule	Potential Control Technology	Air Quality Impacts	Analyzed Further?
11-18 & 12-16	Baghouse with HEPA Filters	None identified (IFC, 2007 & STAPPA /ALAPCO, 2000)	**No**
11-18	Carbon Adsorption	Combustion emissions from regenerating spent carbon	**Yes**

Applicable Rule	Potential Control Technology	Air Quality Impacts	Analyzed Further?
12-16	Compressor	Minor emissions increase in some phases, overall VOC & TAC reduction (SCAQMD, 2013)	**No**
12-16	Cyclone	None identified STAPPA/ALAPCO, 2000)	**No**
11-18 & 12-16	Diesel Oxidation Catalyst	None identified by any sources during technology review	**No**
11-18 & 12-16	Diesel Particulate Filter	Slight NO_2 increase from regenerating filter	**Yes**
12-16	Electrostatic Precipitator (Wet and Dry)	None identified (STAPPA/ALAPCO, 2000)	**No**
12-16	Fuel Gas Treatment (Additive to Existing Amine System)	Slight increase in TAC (caustic) & H_2S emissions in one phase, overall TAC & H_2S reductions (Perry, 2015)	**No**
12-16	Fuel Gas Treatment (Merox)	Slight increase in H_2S emissions in one phase, overall H_2S reductions (Perry, 2015)	**No**
12-16	LoTOx™	Some ozone "slip", but reaction is rapid, impact is minor (CARB, 2005)	**No**
11-18 & 12-16	New Diesel ICEs	None identified by any sources during technology review	**No**
12-16	Selective Catalytic Reduction	Ammonia slip emissions, minor indirect mobile source emission increases	**Yes**
12-16	Selective Oxidation Catalyst	Slight NOx increase (EPA, 1982)	**No**
11-18	Steam Ejector Technology	Minor emissions increase in one phase, overall VOC & TAC reduction (SCAQMD, 2013)	**No**
12-16	SOx Reducing Additive	None identified (Bin, H. and Min-yuan, H., 2000)	**No**

Applicable Rule	Potential Control Technology	Air Quality Impacts	Analyzed Further?
11-18	Thermal Oxidizer	Potential increase in combustion emissions	**Yes**
12-16	Ultracat	Ammonia slip emissions, minor indirect mobile source emission increases	**Yes**
11-18 & 12-16	Wet Gas Scrubber	Slight increase in TAC, minor indirect mobile source emission increases	**Yes**

3.2.4.2.1 Carbon Adsorption – Rule 11-18 Only

Carbon adsorption equipment was identified as one of the control technologies that could be used to reduce cancer and non-cancer health risks by reducing TAC emissions at sewage treatment facilities. The initial control efficiency of carbon adsorption equipment is extremely high, but as the activated carbon becomes saturated with organic material over time, control efficiency drops until breakthrough occurs. When breakthrough occurs, the saturated carbon must be removed and either disposed of or regenerated and the solvent recovered, or removed and destroyed.

Typically, the spent carbon is regenerated by raising the temperature of the carbon, evacuating the bed, or both. A regenerant, either steam or a noncondensible gas, is heated and injected into the carbon bed to desorb the organic materials. This procedure is usually performed daily, but may be done more or less frequently, depending on the capacity of the control unit and the concentration of the VOC being collected. The resulting heated organic mixture is vented to a condenser, where the organic material is separated from the regenerant by gravity or distillation, and recycled or disposed of properly.

Regenerating spent carbon typically requires a combustion source using natural gas as the combustion fuel to heat the regenerant and/or to heat the carbon beds. Only 15 percent of the carbon bed volume collects toxic VOC emissions and a typical carbon bed is sized to reduce VOC emissions by approximately 55 pounds per day. Based on these two characteristics, a typical carbon bed size is approximately 400 pounds (55/0.15 = 400). The projected natural gas fuel use is 5.5 standard cubic feet (scf) of natural gas per pound of carbon and the carbon bed is assumed to be regenerated four times per day (SCAQMD, 2016). Based on the assumption in Subsection 3.2.4.1.4 that up to five carbon adsorption units could be installed under Rule 11-18, the amount of natural gas required per day is estimated to be 0.044 million cubic feet (MMcf) [(400 lbs C) x (5.5 scf/lb C per regen) x (4 regen/day) x (5 Carbon Adsorption Units) = 0.044 MMcf/day]. The projected criteria pollutant emissions from the combustion equipment used to regenerate spent carbon are shown in Table 3.2-22.

TABLE 3.2-22

Potential Operational Air Quality Impacts from Regenerating Spent Carbon from Carbon Adsorption Units

	Pollutant					
	ROG	CO	NOx	SOx	PM10	PM2.5[(1)]
AER Emission Factor (lb/MMcf)[(2)]	7	35	130	0.83	7.5	7.5
Natural Gas Consumed (MMcf/day)	0.062	0.062	0.062	0.062	0.062	0.062
Total Emissions 1 unit (lb/day)	0.43	2.17	8.06	0.05	0.47	0.47
Total Emissions 1 unit (tons/year)	0.08	0.4	1.47	0.01	0.09	0.09
Total Emissions 5 units (lb/day)	2.15	10.85	40.30	0.25	2.35	2.35
Total Emissions 5 units (tons/year)	0.40	2.0	7.35	0.05	0.45	0.45

(1) The PM2.5 fraction of PM10 for natural gas combustion is assumed to be 100%.
(2) Default emission factors for natural gas combustion for external combustion sources. SCAQMD Annual Emissions Reporting.

As shown in Table 3.2-22, regenerating spent carbon used in carbon adsorption units would result in a net increase in criteria pollutant emissions. Since it is expected that carbon adsorption units would operate every day at sewage treatment facilities, daily and annual emissions from all units would be additive.

3.2.4.2.2 Diesel Particulate Filters – Both Rules

Use of DPFs may result in a slight increase in directly emitted NOx during the regeneration of passive DPFs. In response to this undesirable effect, DPF manufacturers have improved their efforts to overcome increased NOx production by using other catalytic formulations or lowering the precious metal content of the traps. One DPF manufacturer has recently developed an improved DPF system capable of reducing PM emissions by at least 85 percent while also limiting NOx emissions to 25 percent compared to NOx emissions without a DPF. Limited test data for newer designs indicate that DPFs can reduce NOx emissions by six to ten percent, so overall there may be a small, but less than significant increase in NOx emissions and with some models there may be a net reduction in NOx emissions from operation of the filter. The net air quality effect of using DPFs is concluded to be neutral.

3.2.4.2.3 Thermal Oxidizers – Rule 11-18 Only

It is expected that thermal oxidizers would be used to control TAC emissions primarily at landfills and sewage treatment facilities. It is unlikely that landfills, also referred to as solid waste disposal sites, would install additional control such as thermal oxidizers because they are currently stringently regulated by Rule 8-34. Similarly, it is unlikely refinery operators would have to install additional controls for their wastewater collection systems because they are stringently regulated pursuant to Rule 8-8. Therefore, it is assumed that installation of thermal oxidizers would occur at sewage treatment facilities.

To quantify air quality impacts from the operation of thermal oxidizers, it is assumed they operate using two million British thermal unit (mmBtu) natural gas burners. The operational emissions associated with operation of one thermal oxidizer are summarized in Table 3.2-23.

TABLE 3.2-23

Potential Operational Air Quality Impacts from Thermal Oxidizers

Pollutant	ROG	CO[(1)]	NOx [(2)]	SOx	PM10	PM2.5
Emission factor in lb/mmscf [(3)]	7.00	0.30	1.04	0.60	7.50	7.50
Heater Duty mmbtu/hr	3.00	3.00	3.00	3.00	3.00	3.00
Operational time hr/day	8.0	8.0	8.0	8.0	8.0	8.0
Emissions lb/day	0.48	21.31	2.63	0.04	0.51	0.51
Emissions tons/yr	0.09	3.89	0.48	0.01	0.09	0.09
5 Facilities Emissions lb/day	2.40	106.55	13.15	0.20	2.55	2.55
5 Facilities Emissions tons/yr	0.45	19.45	2.40	0.05	0.45	0.45

Source: Detailed calculations can be found in BAAQMD, 2016, Appendix A.
(1) Based on 400 ppm
(2) Based on 30 ppm
(3) Default emission factors for natural gas combustion for external combustion sources. SCAQMD Annual Emissions Reporting.

As shown in Table 3.2-23, operating thermal oxidizers would create criteria pollutant emissions during operation. Since it is expected that thermal oxidizers would operate every day at sewage treatment facilities, daily and annual emissions from all units would be additive.

3.2.4.2.4 Wet Gas Scrubbers – Both Rules

Although the main effect of installing air pollution control equipment is reducing emissions, some types of control equipment require delivery of materials that are a necessary part of the pollution control process. For example, WGS operations require a delivery of fresh catalyst and caustic solution on a daily basis. Therefore, indirect emissions occur from trucks delivering supplies (i.e., fresh catalyst and caustic solution to refill the storage tanks) on a regular basis is expected. Similarly, SCR units require delivery of a reducing agent, typically ammonia, to reduce NOx emissions.

Depending on the size and configuration of the WGS, the sodium hydroxide (NaOH) caustic solution used in the WGS would likely need to be delivered one time per week or a little over 50 additional delivery truck trips per year per unit. For example, catalyst and caustic solutions are typically used in relatively small amounts per day. The use of NaOH (50 percent solution, by weight) caustic in a WGS unit would most likely occur at facilities that already use and store NAOH caustic for other purposes, typically in one 10,000-gallon storage tank. Otherwise, the facility operator would need to construct a new NAOH caustic storage tank and ancillary piping and other associated equipment. Since neither Rule 11-18 nor Rule 12-16 specifically identifies emission sources that would need to be controlled, it is assumed for this analysis that a WGS would be built that could be supplied by the same type of caustic solution that is already used onsite for other purposes so construction of a new NaOH storage tank would not be required. Similarly, depending on the size and configuration of the SCR unit, the number of truck trips to deliver ammonia for use in SCRs would be approximately one time every nine days or approximately 40 truck trips per year per unit.

Truck trips transporting the catalyst/caustic or ammonia solutions would occur relatively infrequently and it is not likely that all affected facilities would reduce SO_2 or TAC emissions using a WGS or SCR, respectively. Further, a single truck's emissions while delivering caustic solutions from San Jose to Benicia[3], for example, would be very low, a few pounds per day at most. As shown in Table 3.2-24, indirect mobile source emissions from transporting the catalyst/caustic or ammonia solutions would be low.

TABLE 3.2-24

Delivery Truck Emissions

Material	Number of Truck Trips	Estimated Trip Length (round-trip miles)	Pollutants					
			CO	ROG	NOx	SOx	PM10	PM2.5
Peak Operational Emissions Per Facility (lbs/day)								
Caustic/Catalyst for WGS Unit	2	120	0.06	0.26	1.84	0.02	0.31	0.02
Ammonia for SCR	2	100	0.05	0.22	1.58	0.004	0.031	0.017
Total			0.11	0.48	3.42	0.024	0.341	0.037
Peak Operational Emissions Per Facility (Tons/year)								
Caustic/catalyst for WGS Unit	104	120	0.032	0.14	0.96	0.00	0.160	0.011
Ammonia for SCR	80	100	0.00	0.01	0.06	0.00	0.00	0.00
Peak Operational Emissions Multiple Facilities (Tons/year)								
Caustic/catalyst for 5 WGS Units	520	120	0.16	0.68	4.78	0.005	0.802	0.054
Ammonia for 3 SCRs	240	100	0.01	0.03	0.19	0.00	0.00	0.00
Total			0.17	0.71	4.97	0.005	0.802	0.054

Source: BAAQMD, 2017

3.2.4.2.5 Conclusion

As can be seen in Table 3.2-25, adopting Rule 11-18 would not produce operational emissions that exceed either the Air District's daily criteria pollutant significance thresholds, but annual NOx emissions would exceed the annual NOx emission significance threshold. The thermal oxidizer is the main contributor to NOx emission impacts. ROG,

[3] Review of caustic suppliers located a chemical supplier in San Jose. The haul truck trip from San Jose to the Valero Refining Company in Benicia would likely represent a conservative trip length assumption because trip lengths to all other affected facilities would be shorter.

PM10 and PM2.5 emissions would be less than the applicable significance threshold and, therefore, are concluded to be less than significant.

TABLE 3.2-25

Worst-Case Operational Emissions Under Rule 11-18

ACTIVITY	ROG	CO	NOx	SOx	PM10	PM2.5
Peak Operational Emissions Per Facility Under Rule 11-18 (lbs/day)						
Regenerating Spent Carbon	0.43	2.17	8.06	0.05	0.47	0.47
Caustic/Catalyst for WGS Unit Truck Trips	0.06	0.26	1.84	0.02	0.31	0.02
Thermal Oxidizer	0.48	21.31	2.63	0.04	0.51	0.51
Total Potential Overlapping Emissions	0.97	23.74	12.53	0.11	1.29	1.00
Significance Thresholds	54	None	54	None	82	54
Significant?	No	--	No	--	No	No
Annual Operational Emissions for 1 Facility (tons per year)						
Regenerating Spent Carbon	0.08	0.4	1.47	0.01	0.09	0.09
Caustic/Catalyst for WGS Unit Truck Trips	0.032	0.14	0.96	0.00	0.160	0.011
Thermal Oxidizer	0.45	19.45	2.40	0.05	0.45	0.45
Total Potential Overlapping Emissions	0.54	19.89	4.16	0.06	0.579	0.551
Worst-case Annual Operational Emissions for Multiple Facilities (tons per year)						
Regenerating Spent Carbon	0.40	2.0	7.35	0.05	0.45	0.45
Caustic/Catalyst for WGS 5 Units Truck Trips	0.16	0.68	4.78	0.005	0.802	0.054
Thermal Oxidizer	0.45	19.45	2.40	0.05	0.45	0.45
Total Potential Overlapping Emissions	0.9	21.65	11.2	0.101	1.094	0.954
Significance Thresholds tons/year	10	None	10	None	15	10
Significant?	No	--	**Yes**	--	No	No

As indicated in Table 3.2-26, neither the daily nor annual criteria pollutant significance thresholds for NOx, ROG, PM10, or PM2.5 would be exceeded from adopting Rule 12-16. Therefore, on an individual basis, Rule 12-16 would be less than significant for all criteria pollutants for both daily and annual emissions.

As can be seen in Table 3.2-27, if both rules are adopted, operational emissions would not exceed the Air District's daily criteria pollutant significance thresholds, but annual NOx emissions would exceed the Air District's annual significance threshold for NOx. Therefore, operational NOx emissions would be significant. ROG, PM10 and PM2.5 emissions would be less than the applicable significance threshold and, therefore, are concluded to be less than significant.

It should be noted that in addition to the estimated emission increases associated with the operation of new air pollution control equipment under either Rule 11-18 or 12-16, reduction in air emissions would also be expected. Some of those reductions would be large, for example, a WGS would be expected to result in large SOx and PM10/PM2.5 emissions, as applicable. However, it is not possible to estimate those emission reductions at this point until the sources that will be controlled are known, the type of air pollution control device has been identified, appropriate engineering analyses have been completed and so forth. Nonetheless the potential emission increases are expected to be either wholly or partially offset with emission decreases.

TABLE 3.2-26

Worst-Case Operational Emissions Under Rule 12-16

ACTIVITY	ROG	CO	NOx	SOx	PM10	PM2.5
Peak Operational Emissions Per Facility Under Rule 12-16 (lbs/day)						
Caustic/Catalyst for WGS Unit Truck Trips	0.02	0.08	0.56	0.00	0.07	0.02
Ammonia for SCR Truck Trips	0.05	0.22	1.58	0.004	0.031	0.017
Total Potential Overlapping Emissions	0.9	21.65	11.2	0.101	1.094	0.954
Significance Thresholds lbs/day	54	None	54	None	82	54
Significant?	No	--	No	--	No	No
Annual Operational Emissions for 1 Facility (tons per year)						
Caustic/Catalyst for WGS Unit	0.010	0.04	0.29	0.00	0.039	0.011
Ammonia for SCR	0.00	0.01	0.06	0.00	0.00	0.00
Total Potential Overlapping Emissions	0.07	0.3	2.14	0.004	0.102	0.037
Worst-case Annual Operational Emissions for Multiple Facilities (tons per year)						
Caustic/Catalyst for WGS 5Units	0.188	0.047	0.494	<1.0	0.064	<1.0
Ammonia for SCR 3 Units	0.01	0.03	0.19	0.00	0.00	0.00
Total Potential Overlapping Emissions	0.198	0.077	0.684	0	0.064	0
Significance Thresholds tons/year	10	None	10	None	15	10
Significant?	No	--	No	--	No	No

TABLE 3.2-27

Worst-Case Operational Emissions Under Both Rules

ACTIVITY	ROG	CO	NOx	SOx	PM10	PM2.5
Peak Operational Emissions Both Rules (lbs/day)						
Total Emissions from Rule 11-18	0.97	23.74	12.53	0.11	1.29	1.00
Total Emissions from Rule 12-16	0.9	21.65	11.2	0.10	1.09	0.95
Total Potential Overlapping Emissions	1.83	45.21	22.45	0.19	2.14	1.95
Significance Thresholds lbs/day	54	None	54	None	82	54
Significant?	No	--	No	--	No	No
Worst-case Annual Operational Emissions for Both Rules (tons per year)						
Total Emissions from Rule 11-18	0.9	21.65	11.2	0.101	1.094	0.954
Total Emissions from Rule 12-16	0.198	0.077	0.684	0	0.064	0
Total Potential Overlapping Emissions	1.10	21.73	11.88	0.10	1.16	0.95
Significance Thresholds lbs/day	10	None	10	None	15	10
Significant?	No	--	**Yes**	--	No	No

3.2.4.3 Potential Toxic Air Contaminant Impacts

3.2.4.2.1 Selective Catalytic Reduction & Ultracat (Rule 12-16 Only)

Unreacted ammonia emissions generated from SCR units are referred to as ammonia slip. BACT for ammonia slip is limited to five parts per million (ppm) and enforced by a specific permit condition. Modeling has been performed that shows the concentration of ammonia at a receptor located 25 meters from a stack would be much less than one percent of the concentration at the release from the exit of the stack (SCAQMD, 2015b)[4]. Thus, the peak concentration of ammonia at a receptor located 25 meters from a stack is calculated by assuming a dispersion of one percent. While ammonia does not have an OEHHA approved cancer potency value, it does have non-carcinogenic chronic (200 µg/m3) and acute (3,200 µg/m3) reference exposure levels (RELs). Table 3.2-28 summarizes the calculated non-carcinogenic chronic and acute hazard indices for ammonia and compared these values to the respective significance thresholds; both were shown to be less than significant.

Even if multiple SCRs are installed at one refinery facility under Rule 12-16, the locations of all the stacks would not be situated in the same place within the affected facility's property. As such, even with multiple SCR installations, non- cancer health risks would be less than the acute and chronic hazard indices.

TABLE 3.2-28

Ammonia Slip Calculation

Ammonia Slip Conc. at the Exit of the Stack, ppm(1)	Dispersion Factor(2)	Molecular Weight, g/mol	Peak Conc. at a Receptor 25 m from the Stack, ug/m3	Acute REL, ug/m3	Chronic REL, ug/m3	Acute Hazard Index(3)	Chronic Hazard Index(3)
5	0.01	17.03	35	3,200	200	0.01	0.17

(1) Assumes ammonia slip is limited to five ppm by permitting.
(2) Assumes that the concentration at a receptor 25 m from a stack would be much less than one percent of the concentration at the release from the exist of the stack (SCAQMD, 2015b). The dispersion factor is based on local meteorology.
(3) Hazard index = conc. at receptor 25 m from stack, ug/m3/REL, ug/m3

3.2.4.3.2 Wet Gas Scrubbers and Flue Gas Treatment

To comply with the risk or emission reduction requirements of Rule 11-18 or Rule 12-16, respectively, WGS units with flue gas treatment (FGT) may be installed on FCCUs. For example, caustic is used in the operation of a WGS and some FGT applications. It is assumed for this analysis that refineries already using caustic would install a WGS or FGT application that uses the same type of caustic that is already in use at the refinery.

[4] It is expected that concentrations at 25 meters in the Bay Area would be comparable or less than in southern California because the different meteorological conditions in southern California compared to the Bay Area.

Otherwise, a new storage tank with ancillary piping and equipment would need to be constructed.

There are several types of caustic solutions that can be used in WGS operations, but NaOH (50 percent solution, by weight) is the one most commonly used. NaOH is a TAC that is a non-cancerous, but an acutely hazardous substance. NaOH emissions typically occur as a result of filling loss and the working loss of each NaOH tank, resulting in relatively low NaOH emissions. Because it is assumed that refinery operators would opt to use the same type of caustic that they are currently using for other purposes, there would likely be a small incremental increase in risk because of the increased throughput of caustic through the existing storage tanks. However, because NaOH is typically diluted and used in small quantities, the combined filling loss and working loss would be small. In addition, any NaOH storage tanks would likely be located in the interior areas of a refinery, so the distance to the nearest sensitive receptive would likely be far enough away that substantial dispersion of any NaOH emission would occur. Table 3.2-29 shows the level of NaOH working losses at a receptor located 25 meters from the unit.

TABLE 3.2-29

NaOH Working Losses

Projected Increase in NaOH Demand (tons/day)	A: Hourly NaOH (as PM10) Filling Loss (lb/hr)	B: Hourly NaOH (as PM10) Working Loss (lb/hr)	A + B = Total Hourly NaOH (as PM10) Losses (lb/hr)	NaOH Acute Level at 25 meters (lb/hr)
3.37	7.60E-04	2.28E-03	2.28E-03	2.28E-05

See Appendix B for calculation methodology.

As indicated in Table 3.2-29, the rate of NaOH working loss emissions would be relatively low for any WGS unit. Since it is likely that only one tank would be used to store the NaOH solution at each affected facility, working loss concentrations would not overlap. As such, even with multiple NaOH storage tanks, it is not expected that working loss emissions would exceed the acute and chronic hazard indices.

Further, there is an alternative to using NaOH as the caustic solution, sodium carbonate (Na_2CO_3) which is commonly known as soda ash, a non-toxic, non-cancerous, and nonhazardous substance. This caustic does not have the potential to generate significant adverse TAC emission impacts. For these reasons, it is unlikely that NaOH emissions would create significant adverse acute or chronic hazard impacts to any nearby sensitive receptors.

It should be noted that in addition to the estimated TAC emission increases associated with the operation of new air pollution control equipment under either Rule 11-18 or 12-16, a reduction in TAC emissions would also be expected. However, it is not possible to estimate those emission reductions at this point until the sources that will be controlled are known, the type of air pollution control device has been identified, appropriate engineering analyses have been completed and so forth. Nonetheless, air pollution control equipment installed to control TAC emissions as a result of the proposed rules is expected to result in a reduction in TAC emissions from affected facilities.

3.2.4.4 Conclusion

3.2.4.4.1 Rule 11-18

Based on the evaluation of those air pollution control technologies that would most likely be the used to reduce SO_2, PM2.5, and TAC emissions from affected facilities if required pursuant to Rule 11-18, construction and secondary operational air quality impacts from the proposed project could generate NOx emissions that exceed the Air District's construction and operations emission thresholds. Therefore, construction and operational air quality impacts are concluded to be significant for NOx emissions. ROG, PM10 and PM2.5 emissions would be less than the applicable significance threshold and, therefore, are concluded to be less than significant for both construction and operation.

3.2.4.4.2 Rule 12-16

Based on the evaluation of those air pollution control technologies that would most likely be the used to reduce SO_2, PM2.5, and TAC emissions from affected facilities if required pursuant to Rule 12-16, operational air quality impacts from the proposed project would not exceed the Air District's operations emission thresholds for NOx, ROG, PM10 or PM2.5. However, construction air quality impacts from the proposed project could generate NOx emissions that exceed the Air District's construction emission thresholds. Therefore, construction air quality impacts are concluded to be significant for NOx emissions, but less than significant for ROG, PM10 and PM2.5.

3.2.4.4.3 Both Rules

Based on the evaluation of those air pollution control technologies that would most likely be the used to reduce SO_2, PM2.5, and TAC emissions from affected facilities if both rules were adopted, construction and secondary operational air quality impacts from the proposed project could generate NOx emissions that exceed the Air District's construction and operations emission thresholds. Therefore, construction and operational air quality impacts are concluded to be significant for NOx emissions. ROG, PM10 and PM2.5 emissions would be less than the applicable significance threshold and, therefore, are concluded to be less than significant for both construction and operation.

3.2.5 MITIGATION MEASURES

3.2.5.1 Construction Mitigation Measures

The proposed project is expected to have significant adverse air quality impacts during the construction phase. Therefore, the following mitigation measures will be imposed on future projects comprised of installing air pollution control equipment to reduce emissions associated with construction activities

A-1 Develop a Construction Emission Management Plan for each affected facility to minimize emissions from vehicles including, but not limited to: consolidating truck deliveries; scheduling deliveries to avoid peak hour traffic conditions; describing truck routing; describing deliveries including logging delivery times; describing entry/exit points; identifying locations of parking; identifying construction schedule; and prohibiting truck idling in excess of five consecutive minutes or another timeframe as allowed by the California Code of Regulations, Title 13 §2485 - CARB's Airborne Toxic Control Measure to Limit Diesel-Fueled Commercial Motor Vehicle Idling. The Construction Emission Management Plan shall be submitted to Air District staff for approval prior to the start of construction. At a minimum, the Construction Emission Management Plan would include the following types of mitigation measures.

On-Road Mobile Sources:

A-2 The Emission Management Plan shall include measures to minimize emissions from vehicles including, but not limited to, consolidating truck deliveries, prohibiting truck idling in excess of five minutes as contract conditions with carriers and by posting signs onsite, specifying truck routing to minimize congestion emissions, specifying hours of delivery to avoid peak rush-hour traffic, allowing ingress/egress only at specified entry/exit points to avoid heavily congested traffic intersections and streets, and specifying allowable locations of onsite parking.

Off-Road Mobile Sources:

A-3 Prohibit construction equipment from idling longer than five minutes at the facility under consideration as contract conditions with construction companies and by posting signs onsite.

A-4 Maintain construction equipment tuned up and with two- to four-degree retard diesel engine timing or tuned to manufacturer's recommended specifications that optimize emissions without nullifying engine warranties.

A-5 The facility operator shall survey and document the locations of construction areas and identify all construction areas that are served by electricity. This documentation shall be provided as part of the Construction Emissions

Management Plan. Electric welders shall be used in all construction areas that are demonstrated to be served by electricity.

A-6 The facility operator shall survey and document the locations of construction areas and identify all construction areas that are served by electricity. This documentation shall be provided as part of the Construction Emissions Management Plan. Onsite electricity rather than temporary power generators shall be used in all construction areas that are demonstrated to be served by electricity.

A-7 If cranes are required for construction, the refinery operator shall use cranes rated 200 hp or greater equipped with Tier 4 or equivalent engines. Engines equivalent to Tier 4 may consist of Tier 3 engines retrofitted with diesel particulate filters and oxidation catalysts, selective catalytic reduction, or other equivalent NOx control equipment. Retrofitting cranes rated 200 hp or greater with PM and NOx control devices must occur before the start of construction. If cranes rated 200 hp or greater equipped with Tier 4 engines are not available or cannot be retrofitted with PM and NOx control devices, the facility operator shall use cranes rated 200 hp or greater equipped with Tier 3 or equivalent engines. The facility operator shall provide documentation in the Construction Emissions Management Plan or associated subsequent status reports as information becomes available that cranes rated 200 hp or greater equipped with Tier 4 or equivalent engines are not available.

A-8 For off-road construction equipment rated 50 to 200 hp that will be operating for eight hours or more, the facility operator shall use equipment rated 50 to 200 hp equipped with Tier 4 or equivalent engines. Engines equivalent to Tier 4 may consist of Tier 3 engines retrofitted with diesel particulate filters and oxidation catalysts, selective catalytic reduction, or other equivalent NOx control equipment. Retrofitting equipment rated 50 to 200 hp with PM and NOx control devices must occur before the start of construction. If equipment rated 50 to 200 hp equipped with Tier 4 engines is not available or cannot be retrofitted with PM and NOx control devices, the facility operator shall use equipment rated 50 to 200 hp equipped with Tier 3 or equivalent engines. The facility operator shall provide documentation in the Construction Emissions Management Plan or associated subsequent status reports as information becomes available that equipment rated 50 to 200 hp equipped with Tier 4 or equivalent engines are not available.

3.2.5.1.1 Remaining Construction Impacts

In spite of implementing the construction air quality mitigation measures above such as a WGS, or installation two or more types of air pollution control equipment concurrently, it is possible that construction air quality impacts would continue to exceed any applicable construction air quality significance thresholds and, therefore, remain significant.

3.2.5.2 Operation Mitigation Measures

Because operation air quality impacts would be generated primarily by air pollution control equipment, mitigation measures are limited because the air pollution control equipment analyzed are considered BACT (defined as lowest achievable emission rate (LAER)) or BARCT (reasonably available control technology (RACT) and, as a result, other types of control equipment may not be acceptable if they are not able to comply with LAER or RACT standards. Therefore, no mitigation measures were identified to reduce operational air quality impacts to less than significant.

Further, it may not be possible to replace a thermal oxidizer with a carbon adsorption unit in all circumstances. Therefore, it is probable that operational air quality impacts would continue to exceed the applicable operational air quality significance threshold and, therefore, remain significant.

3.2.6 CUMULATIVE AIR QUALITY IMPACTS

Pursuant to CEQA Guidelines §15130(a), "An EIR shall discuss cumulative impacts of a project when the project's incremental effect is cumulatively considerable, as defined in section 15065 (a)(3). Where a lead agency is examining a project with an incremental effect that is not "cumulatively considerable," a lead agency need not consider that effect significant, but shall briefly describe its basis for concluding that the incremental effect is not cumulatively considerable. Further, CEQA Guidelines §15130 requires that an EIR reflect the severity of the cumulative impacts from a proposed project and their likelihood of occurrence, but the discussion need not provide as great detail as is provided for the effects attributable to the project alone. The discussion should be guided by standards of practicality and reasonableness. Cumulative impacts are defined by CEQA as "two or more individual effects which, when considered together, are considerable or which compound or increase other environmental impacts" (CEQA Guidelines, §15355).
Cumulative impacts are further described as follows:

- The individual effects may be changes resulting from a single project or a number of separate projects. (State CEQA Guidelines §15355(a).

- The cumulative impacts from several projects are the changes in the environment which result from the incremental impact of the project when added to other closely related past, present, and reasonably foreseeable future projects. Cumulative impacts can result from individually minor but collectively significant projects taking place over a period of time (CEQA Guidelines, §15355(b)).

- A "cumulative impact" consists of an impact that is created as a result of the combination of the project evaluated in the EIR together with other projects causing related impacts. An EIR should not discuss impacts which do not result in part from the project evaluated in the EIR. (CEQA Guidelines, §15130(a)(1)).

With regard to related projects or projects with related environmental impacts, because the proposed project consists of promulgating either Rule 11-18, Rule 12-16, or both, related projects would consist of other past, present, and probable future BAAQMD rules and regulations, as well as implementing control measures in the 2017 Clean Air Plan control measures.

3.2.6.1 Criteria Air Pollutants

3.2.6.1.1 Construction Air Quality Impacts

In the analysis of construction air quality impacts, it was concluded that air quality impacts from construction activities would be significant from implementing the proposed project because installing one large or two or more moderately-sized pieces of air pollution control equipment would likely exceed the applicable BAAQMD significance thresholds for construction air quality impacts. Further, it was concluded that, even after implementing mitigation measures, construction air quality impacts would continue to exceed the applicable significance thresholds for construction. Thus, the air quality impacts due to construction are considered to be cumulatively considerable pursuant to CEQA Guidelines §15064 (h)(1) and therefore, generate significant adverse cumulative construction air quality impacts. It should be noted, however, that the air quality analysis is a conservative, "worst-case" analysis so the actual construction impacts are not expected to be as great as estimated here. Further, the construction activities are temporary and would be terminated once any future construction activities are completed.

3.2.6.1.2 Operational Air Quality Impacts

As noted above, implementing Rule 11-18 has the potential to generate significant adverse project-specific NOx impacts because NOx emissions exceed the Air District's annual NOx significance threshold. As a result, annual NOx emission impacts from Rule 11-18 are considered to be cumulatively considerable pursuant to CEQA Guidelines §15064 (h)(1) and, therefore, are concluded to be cumulatively significant. Because operational emissions for Rule 12-16 do not exceed any of the applicable operational air quality significance thresholds, which also serve as the cumulative significance thresholds, they are not considered to be cumulatively considerable (CEQA Guidelines §15064 (h)(1)) and, therefore are not expected to generate significant adverse cumulative operational impacts. Adopting both rules would result in significant cumulative NOx air quality impacts, primarily generated by Rule 11-18. ROG, PM10 and PM2.5 emissions would be less than the applicable significance threshold and, therefore, are concluded to be less than significant and not cumulatively considerable for both construction and operation.

As discussed above, in addition to the estimated emission increases associated with the operation of new air pollution control equipment under either Rule 11-18 or 12-16, reductions in air emissions would also be expected, some of which are potentially large (e.g., WSG). However, it is not possible to estimate those emission reductions at this point until the sources that will be controlled are known, the type of air pollution control device has been identified, appropriate engineering analyses have been completed and so forth. Nonetheless the potential emission increases are expected to be either wholly or partially offset with emission decreases.

3.2.6.2 Toxic Air Contaminants

It was concluded for the analysis of TAC air quality impacts, that TAC emissions from operation of SCR, Ultracat, or WGS units would be minor and less than significant. Because operational TAC emissions do not exceed the applicable cancer and non-cancer health risk significance thresholds, they are not considered to be cumulatively considerable (CEQA Guidelines §15064 (h)(1)) and, therefore are not expected to generate significant adverse cumulative cancer and non-cancer health risk impacts. In addition, reductions in TAC emissions would be expected due to implementation of Rule 11-18, but those emission reductions and the related health risk benefits cannot be estimated at this time.

CHAPTER 3.3

GREENHOUSE GAS EMISSIONS

3.3 GREENHOUSE GAS EMISSIONS

This subchapter of the EIR evaluates the potential greenhouse gas (GHG) impacts associated with implementation of Rules 11-18 and/or 12-16. Rule 11-18 would reduce exposure to TAC emissions from a number of stationary sources within the Bay Area, including refineries. Rule 12-16 would establish numeric emission limits on specific refinery and associated facilities within the Bay Area.

As discussed in the Initial Study, implementation of Rule 11-18 would reduce risk from facilities that emit toxic air contaminants throughout the Bay Area. However, certain risk reduction measures have the potential to increase emissions of other pollutants, such as GHGs and criteria pollutants. Implementation of Rule 12-16 would prevent refinery emissions of GHGs and some criteria pollutants from increasing. Similarly, secondary adverse air quality impacts could occur from installing control equipment at individual refineries in response to changes that could increase emissions some of criteria pollutants. Adverse impacts include increased GHG emissions associated with construction activities and combustion sources from certain types of air pollution control equipment. The NOP/IS (see Appendix A) determined that potential GHG impacts associated with implementation of the proposed new rules are potentially significant. In addition, Rule 12-16 would establish GHG emission limits at refineries and could conflict with CARB's AB32 Cap and Trade program. Project-specific and cumulative adverse GHG impacts associated with the proposed new rules have been evaluated in Chapter 3.3 of this EIR.

3.3.1 INTRODUCTION

Global climate change refers to changes in average climatic conditions on the earth as a whole, including: temperature, wind patterns, precipitation and storms. Global warming, a related concept, is the observed increase in the average temperature of the earth's surface and atmosphere. One identified cause of global warming is an increase of GHGs in the atmosphere. The six major GHGs identified by the Kyoto Protocol are CO_2, methane (CH_4), nitrous oxide (N_2O), sulfur hexafluoride (SF_6), haloalkanes (HFCs), and perfluorocarbons (PFCs). Although not included among the Kyoto Six GHGs, black carbon, a key component of fine PM, has been identified as a potent agent of climate change. Black carbon is the third largest GHG in the Bay Area on a carbon dioxide equivalence (CO2e) basis. Diesel engines and wood-burning are key sources of black carbon in the Bay Area.

The GHGs absorb longwave radiant energy reflected by the earth, which warms the atmosphere. GHGs also radiate longwave radiation both upward to space and back down toward the surface of the earth. The downward part of this longwave radiation absorbed by the atmosphere is known as the "greenhouse effect."

While the cumulative impact of GHG emissions is global, the geographic scope of this cumulative impact analysis is the State of California. The analysis of GHG emissions is a different analysis than for criteria pollutants for the following reasons. For criteria pollutants, significance thresholds are based on daily emissions because attainment or non-attainment is typically based on daily exceedances of applicable ambient air quality standards. Further, the ambient air quality standards for criteria pollutants are based on relatively short-term exposure effects to human health, e.g., one-hour and eight-hour. Using the half-life of CO_2, 100 years, for example, the effects of GHGs are longer-term, affecting the global climate over a relatively long time frame.

It is the increased accumulation of GHGs in the atmosphere that may result in global climate change. Climate change involves complex interactions and changing likelihoods of diverse impacts. Due to the complexity of conditions and interactions affecting global climate change, it is not possible to predict the specific impact, if any, attributable to GHG emissions associated with a single project, which is why GHG emission impacts are considered to be a cumulative impact.

Emissions of GHGs, especially combustion of fossil fuels for energy, transportation, and manufacturing, contribute to warming of the atmosphere that may cause rapid changes in the way a number different types of ecosystems typically function. For example, in some regions, changing precipitation or acceleration of melting snow and ice are altering hydrological systems, affecting water resources in terms of quantity and quality. Melting glaciers and polar ice sheets are expected to contribute to sea level rise. Rising sea levels are expected to contribute to an increase in coastal flooding events.

A warmer atmosphere could also contribute to chemical reactions increasing the formation of ground-level ozone. Ozone is a well-known lung irritant and a major trigger of respiratory problems like asthma attacks. Local changes in temperature and rainfall could alter the distribution of some waterborne illnesses and disease vectors. For example, warmer freshwater makes it easier for pathogens to grow and contaminate drinking water.

Potential health effects from global climate change may arise from temperature increases, climate-sensitive diseases, extreme events, and air quality. There may be direct temperature effects through increases in average temperature leading to more extreme heat waves and less extreme cold spells. Those living in warmer climates are likely to experience more stress and heat-related problems (i.e., heat rash and heat stroke). In addition, climate sensitive diseases may increase, such as those spread by mosquitoes and other disease carrying insects. Those diseases include malaria, dengue fever, yellow fever, and encephalitis. Extreme events such as flooding and hurricanes can displace people and agriculture, which would have negative consequences. Drought in some areas may increase, which would decrease water and food availability. Global climate change may also exacerbate air quality problems from increased frequency of exceeding criteria pollutant ambient air quality standards.

This chapter analyzes how implementation of Rules 11-18 and/or 12-16 may contribute to global climate change through increased GHG emissions.

3.3.2 ENVIRONMENTAL SETTING

There are dozens of GHGs, but a subset of these gases are the primary agents of climate change. The six major GHGs identified by the Kyoto Protocol plus black carbon are the GHGs considered in the 2017 Plan.

Carbon Dioxide (CO_2) is released to the atmosphere when fossil fuels (oil, gasoline, diesel, natural gas, and coal), solid waste, and wood or wood products are burned.

Methane (CH_4) is emitted during the production and transport of coal, natural gas, and oil. Methane emissions also result from the decomposition of organic waste in municipal solid waste landfills and the raising of livestock.

Nitrous oxide (N_2O) is emitted during agricultural and industrial activities, as well as during combustion of solid waste and fossil fuels.

Hydrofluorocarbons (HFCs), **perfluorocarbons** (PFCs), and **sulfur hexafluoride** (SF_6), are generated by a variety of industrial processes. Emissions of these fluorinated gases (F-gases) are small on a mass basis, but they are potent agents of climate change on a per unit basis.

Black Carbon: Although not included among the Kyoto Six GHGs, black carbon is a key component of fine particulate matter and has been identified as a potent agent of climate change. Black carbon is the third largest GHG in the Bay Area on a CO_2-equivalent basis. Diesel engines and wood-burning are key sources of black carbon in the Bay Area. Since exposure to fine PM has a wide range of health impacts, reducing emissions of black carbon will provide important public health co-benefits.

Table 3.3-1 shows atmospheric lifespan, 20-year and 100-year GWP values, and key emission sources for the GHGs.

An emissions inventory is a detailed estimate of the amount of air pollutants discharged into the atmosphere of a given area by various emission sources during a specific time period. The emission inventory in Table 3.3-2 focuses on GHG emissions due to human activities in the State of California. In 2014, total GHG emissions were 441.5 million metric tons of CO2 equivalent (MMTCO2e), a decrease of 3.51 MMTCO2e compared to 2010.

TABLE 3.3-1

Greenhouse Gases Addressed in the 2016 Plan

Greenhouse Gas	Atmospheric Lifespan	GWP * (20-year timeframe)	GWP * (100-year timeframe)	Key Emissions Sources
Carbon dioxide (CO_2)	20-200 years	1	1	Fossil fuel combustion
Nitrous oxide (N_2O)	114 years	268	298	Motor vehicles, agriculture, water treatment, composting
Methane (CH_4)	12 years	86	34	Natural gas production & distribution, solid waste disposal, ranching, dairies
Hydrofluorocarbons (HFCs)	1.5 to 264 years	506 to 6,940	138 to 8,060	Refrigeration, air conditioning
Perfluorocarbons (PFCs)	3,000 years or more	6,500	6,500	Semiconductor manufacturing
Sulfur Hexafluoride (SF_6)	3,200 years	17,500	23,500	Electricity grid losses
Black Carbon**	Days to weeks	3,235	900	Diesel engines, wood-burning

* The GWP values in Table 3.3-1 are taken from the IPCC 5th Assessment Report (AR5), with the exception of black carbon.
** The black carbon values are based on from US EPA report on black carbon: https://www3.epa.gov/blackcarbon/2012report/Chapter2.pdf

TABLE 3.3-2

California Greenhouse Gas Emission and Sinks Summary
(million metric tons CO2e)

Categories Included in the Inventory	2004	2010	2014
ENERGY	**427.53**	**378.67**	**367.71**
Fuel Combustion Activities	**420.08**	**370.95**	**359.87**
Energy Industries	172.76	144.85	139.95
Manufacturing Industries & Construction	19.52	18.72	20.28
Transport	181.43	161.84	158.62
Other Sectors	46.37	45.55	41.02
Fugitive Emissions from Fuels	**7.45**	**7.72**	**7.84**
Solid Fuels	0.04	0.02	0.02
Oil and Natural Gas	6.18	6.53	6.89
Geothermal Energy Production	1.12	1.10	0.92
Pollution Control Devices	0.11	0.06	0.00
INDUSTRIAL PROCESSES & PRODUCT USE	**19.81**	**22.40**	**30.24**
Mineral Industry	6.11	3.49	5.32
Chemical Industry	0.05	0.05	0.01
Metal Industry	0.07	0.07	0.06
Non-Energy Products from Fuels & Solvent Use	2.65	2.47	2.38
Electronics Industry	0.35	0.20	0.26
Product Uses as Substitutes for Ozone Depleting Substances	6.37	11.93	16.76
Other Product Manufacture & Use Other	0.90	0.82	0.72
Other	3.31	3.36	4.73
AGRICULTURE, FORESTRY, & OTHER LAND USE	**30.62**	**33.51**	**32.85**
Livestock	20.81	24.00	23.81
Aggregate Sources & Non-CO_2 Emissions Sources on Land	9.80	9.51	9.04
WASTE	**9.67**	**10.48**	**10.73**
Solid Waste Disposal	7.42	8.11	8.28
Biological Treatment of Solid Waste	0.33	0.47	0.57
Wastewater Treatment & Discharge	1.92	1.90	1.88
Included California Emissions	**487.63**	**445.05**	**441.54**

Source: 2016 Edition California GHG Inventory for 2000-2014 by IPCC (CARB, 2016)

Table 3.3-3 presents the GHG emission inventory by major source categories in calendar year 2015, as identified in the Air District's 2017 Air Plan (BAAQMD, 2017). Transportation sources generate approximately 40 percent of the total GHG emissions in the District. The remaining 60 percent of the total District GHG emissions are from stationary and area sources.

TABLE 3.3-3

2015 BAAQMD Greenhouse Gas Emission Inventory (metric tons of CO_2e)

Source Category	CO2, CH4, N2O, HFC/PFC, SF6	Black Carbon	Total Emissions (CO2e)
Transportation	**35,040,000**	**770,000**	**35,810,000**
On-road	30,480,000	310,000	30,790,000
Off-road	4,560,000	460,000	5,020,000
Electricity/Co-Generation	**15,790,000**	**130,000**	**15,920,000**
Co-Generation	6,790,000	90,000	6,880,000
Electricity Generation	6,210,000	40,000	6,250,000
Electricity Imports	2,790,000	-	2,790,000
Buildings	**9,870,000**	**400,000**	**10,270,000**
Residential Fuel Usage	6,460,000	220,000	6,680,000
Commercial Fuel Usage	3,410,000	180,000	3,590,000
Stationary Sources	**20,840,000**	**340,000**	**21,180,000**
Oil Refineries	14,240,000	210,000	14,450,000
General Fuel Usage	5,880,000	130,000	6,010,000
Fugitive/Process Emissions	720,000	4,000	724,000
Waste Management	**2,480,000**	**23,000**	**2,503,000**
Landfills	2,050,000	22,000	2,072,000
Composting/POTWs	430,000	1,000	431,000
High-GWP Gases	**2,790,000**	**-**	**2,790,000**
HFCs and PFCs	2,740,000	-	2,740,000
SF6	50,000	-	50,000
Agriculture	**1,180,000**	**170,000**	**1,350,000**
Agricultural Equipment	180,000	43,000	223,000
Animal Waste	720,000	16,000	736,000
Soil Management	270,000	1,000	271,000
Biomass Burning	10,000	110,000	120,000
Total Emissions	**87,990,000**	**1,833,000**	**89,823,000**

Source: BAAQMD, 2015

The emission inventory in Table 3.3-3 focuses on GHG emissions projections due to human activities only, and compiles emission estimates that result from industrial, commercial, transportation, domestic, forestry, and agriculture activities in the San Francisco Bay Area region of California. The GHG emission inventory reports direct emissions generated from sources within the District. The report does not include indirect emissions, for example, a source using electricity has no direct emissions because emissions are emitted at the power plants. Emissions of CO_2, CH_4, N_2O, HFCs, PFCs, and SF_6 are estimated using the most current activity and emission factor data from various sources. Emission factor data was obtained from the U.S. Department of Energy's (DOE's) Energy Information Administration (EIA), the CEC, and CARB.

Under "business as usual" conditions, GHG emissions are expected to grow in the future due to population growth and economic expansion. Table 3.3-4 shows emissions trends by major sources for the period 1990 to 2020.

TABLE 3.3-4

Bay Area GHG Emission Trends by Major Sources
(Million metric Tons CO_2 - Equivalent)

Category	1990	2008	2011	2014	2017	2020
Transportation	28.6	34.8	34.3	33.9	32.5	30.4
Industry/Commercial	21	28.9	31	32.6	34.3	36
Electricity/Co-Gen.	8.4	13.9	12.1	12.9	12.6	12.3
Residential Fuel	7	6.5	6.6	6.7	6.8	6.9
Off-Road Equipment	0.9	1.4	1.3	1.3	1.4	1.3
Agriculture	1.2	1.3	1.3	1.3	1.3	1.3
Total	67.1	86.8	86.6	88.7	88.8	88.2

Source: Bay Area Emission Inventory Summary Report: Greenhouse Gases. (BAAQMD, 2015a)

Greenhouse gas emissions in Table 3.3-4 are projected based on estimated growth in various source categories. For example, CARB's EMFAC2011 and OFFROAD2007 computer models were utilized to project GHG emissions from transportation sources. In these models, fuel consumption estimates were based on the anticipated change of fleet mix and the growth of various types of on-road and off-road vehicles. Growth in vehicle miles traveled is based on the MTC's Regional Transportation Plan (RTP2030). For aircraft categories, the fleet mix, activity, and growth data are based on information from the Bay Area airports in combination with the MTC's Regional Airport System Planning Analysis: 2011 Update and the Federal Aviation Administration's (FAA's) 2010 Terminal Area Forecast reports (BAAQMD 2015a).

The GHG projections from other major sources such as landfills, natural gas fuel distribution, and cement manufacturing were estimated by using 2009 Association of Bay Area Government's employment and population data. California Integrated Waste Management data were also considered in the landfill projection process. This GHG emission inventory will be updated as additional information about activity data, emission factors and other inputs becomes available (BAAQMD, 2015a).

3.3.3 REGULATORY SETTING

3.3.3.1 Federal Regulations

Greenhouse Gas Endangerment Findings: On December 7, 2009, the U.S. EPA Administrator signed two distinct findings regarding greenhouse gases under section 202(a) of the CAA. The Endangerment Finding stated that CO_2, CH_4, N_2O, HFCs, PFCs, and SF_6 taken in combination endanger both the public health and the public welfare of current and future generations. The Cause or Contribute Finding stated that the combined emissions from motor vehicles and motor vehicle engines contribute to the GHG emissions that endangers public health and welfare. These findings were a prerequisite for implementing GHG standards for vehicles. The U.S. EPA and the National Highway Traffic Safety Administration (NHTSA) finalized emission standards for light-duty vehicles in May 2010 and for heavy-duty vehicles in August of 2011.

Renewable Fuel Standard: The RFS program was established under the Energy Policy Act (EPAct) of 2005, and required 7.5 billion gallons of renewable-fuel to be blended into gasoline by 2012. Under the Energy Independence and Security Act (EISA) of 2007, the RFS program was expanded to include diesel, required the volume of renewable fuel blended into transportation fuel be increased from nine billion gallons in 2008 to 36 billion gallons by 2022, established new categories of renewable fuel and required the U.S. EPA to apply lifecycle GHG performance threshold standards so that each category of renewable fuel emits fewer greenhouse gases than the petroleum fuel it replaces. The RFS is expected to reduce greenhouse gas emissions by 138 million metric tons, about the annual emissions of 27 million passenger vehicles, replacing about seven percent of expected annual diesel consumption and decreasing oil imports by $41.5 billion.

GHG Tailoring Rule: On May 13, 2010, U.S. EPA finalized the Tailoring Rule to phase in the applicability of the PSD and Title V operating permit programs for GHGs. The rule was tailored to include the largest GHG emitters, while excluding smaller sources (restaurants, commercial facilities and small farms). The first step (January 2, 2011 to June 30, 2011) addressed the largest sources that contributed 65 percent of the stationary GHG sources. Title V GHG requirements were triggered only when affected facility owners/operators were applying, renewing or revising their permits for non-GHG pollutants. PSD GHG requirements were applicable only if sources were undergoing permitting actions for other non-GHG pollutants and the permitted action would increase GHG emission by 75,000 metric tons of CO2e per year or more.

On June 23, 2014, the U.S. Supreme Court issued its decision in Utility Air Regulatory Group v. EPA, 134 S.Ct. 2427 (2014). The Court held that U.S. EPA may not treat GHGs as an air pollutant for purposes of determining whether a source is a major source required to obtain a PSD or Title V permit. The Court also held that PSD permits that are otherwise required to be subject to PSD (based on emissions of other pollutants) may continue to require limitations on GHG emissions based on the application of BACT. In accordance with the Supreme Court decision, on April 10, 2015, the D.C. Circuit issued an amended judgment in Coalition for Responsible Regulation, Inc. v. Environmental Protection Agency, Nos. 09-1322, 10-073, 10-1092 and 10-1167 (D.C. Cir. April 10, 2015), which, among other things, vacated the PSD and Title V regulations under review in that case to the extent that they require a stationary source to obtain a PSD or Title V permit solely because the source emits or has the potential to emit GHGs above the applicable major source thresholds.

GHG Reporting Program: U.S. EPA issued the Mandatory Reporting of Greenhouse Gases Rule (40 CFR Part 98) under the 2008 Consolidated Appropriations Act. The Mandatory Reporting of Greenhouse Gases Rule requires reporting of GHG data from large sources and suppliers under the Greenhouse Gas Reporting Program. Suppliers of certain products that would result in GHG emissions if released, combusted or oxidized; direct emitting source categories; and facilities that inject CO_2 underground for geologic sequestration or any purpose other than geologic sequestration are included. Facilities that emit 25,000 metric tons or more per year of GHGs in CO_2 equivalents (CO2e) are required to submit annual reports to U.S. EPA. For the 2014 calendar year, there were over 8,000 entities that reported 3.20 billion metric tons of GHG emissions under this program. CO_2 emissions accounted for the largest share of direct emissions with 91.5 percent, followed by methane with seven percent, and nitrous oxide and fluorinated gases representing the remaining 1.5 percent (U.S. EPA, 2016a).

National Program to Improve Fuel Economy: On September 15, 2009, the NHTSA and U.S. EPA announced a proposed joint rule that would explicitly tie fuel economy to GHG emissions reductions requirements. The proposed new corporate average fuel economy (CAFÉ) Standards would cover automobiles for model years 2012 through 2016, and would require passenger cars and light trucks to meet a combined, per mile, carbon dioxide emissions level. It was estimated that by 2016, this GHG emissions limit could equate to an overall light-duty vehicle fleet average fuel economy of as much as 35.5 miles per gallon. The proposed standards required model year 2016 vehicles to meet an estimated combined average emission level of 250 grams of carbon dioxide per mile under EPA's GHG program. On November 16, 2011, EPA and NHTSA issued a joint proposal to extend the national program of harmonized GHG and fuel economy standards to model year 2017 through 2025 passenger vehicles. In August 2012, the President of the United States finalized standards that will increase fuel economy to the equivalent of 54.5 mpg for cars and light-duty trucks by Model Year 2025.

Clean Power Plan: On August 3, 2015, the President of the United States and the U.S. EPA announced the Clean Power Plan. The Clean Power Plan sets achievable standards to reduce carbon dioxide emissions by 32 percent from 2005 levels by 2030. This Plan establishes final emissions guidelines for states to follow in developing plans to reduce GHG emissions from existing fossil fuel-fired electric generating units (EGUs). Specifically, the U.S. EPA established: (1) carbon dioxide emission performance rates representing the best system of emission reduction (BSER) for two subcategories of existing fossil fuel-fired EGUs, fossil fuel-fired electric utility steam generating units and stationary combustion turbines; (2) state-specific carbon dioxide goals reflecting the carbon dioxide emission performance rates; and (3) guidelines for the development, submittal and implementation of state plans that establish emission standards or other measures to implement the carbon dioxide emission performance rates, which may be accomplished by meeting the state goals. This final rule will continue progress already under way to reduce carbon dioxide emissions from the utility power sector in the U.S. In February 2016, the U.S. Supreme Court issued a stay of this rule pending final determination on litigation challenging the rule.

Planning for Federal Sustainability in the Next Decade: Published June 10, 2015, Executive Order 13693, *Planning for Federal Sustainability in the Next Decade*, revokes multiple prior Executive Orders and memorandum. The Executive Order outlines goals for federal agencies in the areas of energy, climate change, water use, vehicle fleets, construction, and acquisition. The goal is to maintain federal leadership in sustainability and GHG emission reductions. Federal agencies shall, where life-cycle cost-effective, beginning in fiscal year 2016:

- Reduce agency building energy intensity as measured in Btu/ft2 by 2.5 percent annually through 2025.
- Improve data center energy efficiency at agency buildings.
- Ensure a minimum percentage of total building electric and thermal energy shall be from clean energy sources.
- Improve agency water use efficiency and management (including stormwater management).
- Improve agency fleet and vehicle efficiency and management by achieving minimum percentage GHG emission reductions.

3.3.3.2 State Regulations

Executive Order S-3-05: In June 2005, then Governor Schwarzenegger signed Executive Order S-3-05, which established GHG emission reduction targets. The goals would reduce GHG emissions to 2000 levels by 2010, then to 1990 levels by 2020, and to 80 percent below 1990 levels by 2050.

AB 32: Global Warming Solutions Act: On September 27, 2006, AB 32, the California Global Warming Solutions Act of 2006. AB 32 expanded on Executive Order S-3-05. The legislature stated that "global warming poses a serious threat to the economic well-being, public health, natural resources, and the environment of California." AB 32 established a program to limit GHG emissions from major industries that includes penalties for non-compliance. While acknowledging that national and international actions will be necessary to fully address the issue of global warming, AB 32 lays out a program to inventory and reduce GHG emissions in California and from power generating facilities located outside the state that serve California residents and businesses.

Authorized by AB 32, the Cap and Trade program is one of several strategies that California uses to reduce GHG emissions. CARB adopted the California Cap and Trade program final regulations on October 20, 2011, and adopted amended regulations on September 12, 2012, with the first auction for GHG allowances on November 14, 2012. Funds received from the program are deposited into the Greenhouse Gas Reduction Fund and appropriated by the Legislature. It sets a GHG emissions limit that will decrease by two percent each year until 2015, and then three percent from 2015 to 2020 to achieve the goals in AB 32. The program initially applies to large electric power plants and large industrial plants, and included fuel distributors in 2015. These rules encompass 85 percent of all of California's GHG emissions.

SB 97 - CEQA: Greenhouse Gas Emissions: On August 24, 2007, Governor Schwarzenegger signed into law Senate Bill (SB) 97 – CEQA: Greenhouse Gas Emissions stating, "This bill advances a coordinated policy for reducing greenhouse gas emissions by directing the Office of Planning and Research (OPR) and the Resources Agency to develop CEQA guidelines on how state and local agencies should analyze, and when necessary, mitigate greenhouse gas emissions." OPR's amendments provided guidance to public agencies regarding the analysis and mitigation of the effects of GHG emissions in draft CEQA documents. The amendments did not establish a threshold for significance for GHG emissions. The amendments became effective on March 18, 2010.

Office of Planning and Research Technical Advisory on CEQA and Climate Change: Consistent with SB 97, on June 19, 2008, OPR released its "Technical Advisory on CEQA and Climate Change," which was developed in cooperation with the Resources Agency, Cal/EPA, and CARB. According to OPR, the "Technical Advisory" offers informal interim guidance regarding the steps lead agencies should take to address climate change in their CEQA documents, until CEQA guidelines are developed pursuant to SB 97 on how state and local agencies should analyze, and when necessary, mitigate greenhouse gas emissions.

According to OPR, lead agencies should determine whether greenhouse gases may be generated by a proposed project, and if so, quantify or estimate the GHG emissions by type and source. Second, the lead agency must assess whether those emissions are individually or cumulatively significant. When assessing whether a project's effects on climate change are "cumulatively considerable" even though the GHG contribution of the project may be individually limited, the lead agency must consider the impact of the project when viewed in connection with the effects of past, current, and probable future projects. Finally, if the lead agency determines that the GHG emissions from the project as proposed are potentially significant, it must investigate and implement ways to avoid, reduce, or otherwise mitigate the impacts of those emissions.

AB 1493 Vehicular Emissions: Carbon Dioxide: Prior to the U.S. EPA and NHTSA joint rulemaking, the Governor signed AB 1493 (2002). AB 1493 requires that CARB develop and adopt, by January 1, 2005, regulations that achieve "the maximum feasible reduction of greenhouse gases emitted by passenger vehicles and light-duty trucks and other vehicles determined by CARB to be vehicles whose primary use is noncommercial personal transportation in the state."

CARB originally approved regulations to reduce GHGs from passenger vehicles in September 2004, with the regulations that apply to 2009 and later model year vehicles. California's first request to the U.S. EPA to implement GHG standards for passenger vehicles was made in December 2005 and denied in March 2008. The U.S. EPA then granted California the authority to implement GHG emission reduction standards for new passenger cars, pickup trucks and sport utility vehicles on June 30, 2009.

On April 1, 2010, CARB filed amended regulations for passenger vehicles as part of California's commitment toward the National Program to reduce new passenger vehicle GHGs from 2012 through 2016. The amendments will prepare California to harmonize its rules with the federal Light-Duty Vehicle GHG Standards and CAFÉ Standards (discussed above).

Senate Bill 1368 (2006): SB 1368 is the companion bill of AB 32 and was signed by Governor Schwarzenegger in September 2006. SB 1368 required the California Public Utilities Commission (PUC) to establish a greenhouse gas emission performance standard for baseload generation from investor owned utilities by February 1, 2007. The California Energy Commission (CEC) was required to establish a similar standard for local publicly owned utilities by June 30, 2007. These standards cannot exceed the greenhouse gas emission rate from a baseload combined-cycle natural gas fired plant. The legislation further requires that all electricity provided to California, including imported electricity, must be generated from plants that meet the standards set by the PUC and CEC.

Executive Order S-1-07 (2007): Governor Schwarzenegger signed Executive Order S-1-07 in 2007 which finds that the transportation sector is the main source of GHG emissions in California. The executive order proclaims the transportation sector accounts for over 40 percent of statewide GHG emissions. The executive order also establishes a goal to reduce the carbon intensity of transportation fuels sold in California by a minimum of 10 percent by 2020.

In particular, the executive order established a Low-Carbon Fuel Standard (LCFS) and directed the Secretary for Environmental Protection to coordinate the actions of the CEC, CARB, University of California, and other agencies to develop and propose protocols for measuring the "life-cycle carbon intensity" of transportation fuels. This analysis supporting development of the protocols was included in the State Implementation Plan for alternative fuels (State Alternative Fuels Plan adopted by CEC on December 24, 2007) and was submitted to CARB for consideration as an "early action" item under AB 32. CARB adopted the LCFS on April 23, 2009.

Senate Bill 375 (2008): SB 375, signed in September 2008, aligns regional transportation planning efforts, regional GHG reduction targets, and land use and housing allocation. SB 375 requires Metropolitan Planning Organizations (MPOs) to adopt a Sustainable Communities Strategy (SCS) or Alternative Planning Strategy (APS) which prescribes land use allocation in that MPO's Regional Transportation Plan (RTP). CARB, in consultation with MPOs, is required to provide each affected region with reduction targets for GHGs emitted by passenger cars and light trucks in the region for the years 2020 and 2035. These reduction targets will be updated every eight years but can be updated every four years if advancements in emissions technologies affect the reduction strategies to achieve the targets. CARB is also charged with reviewing each MPO's SCS or APS for consistency with its assigned GHG emission reduction targets. CARB set the following reduction targets for ABAG/MTC region: reduce per capita seven percent of GHG emissions below 2005 levels by 2020 and 15 percent below 2005 levels by 2035.

Executive Order S-13-08 (2008): Governor Schwarzenegger signed Executive Order S-13-08 on November 14, 2008 which directs California to develop methods for adapting to climate change through preparation of a statewide plan. The executive order directs OPR, in cooperation with the Resources Agency, to provide land use planning guidance related to sea level rise and other climate change impacts.

Senate Bills 1078 and 107 and Executive Order S-14-08 (2008): SB 1078 (Chapter 516, Statutes of 2002) requires retail sellers of electricity, including investor owned utilities and community choice aggregators, to provide at least 20 percent of their supply from renewable sources by 2017. SB 107 (Chapter 464, Statutes of 2006) changed the target date to 2010. In November 2008, then Governor Schwarzenegger signed Executive Order S-14-08, which expands the state's Renewable Portfolio Standard to 33 percent renewable power by 2020.

SB X-1-2 and the Clean Energy and Pollution Reduction Act of 2015: SB X-1-2, signed by Governor Edmund G. Brown, Jr. in April 2011, created a new Renewables Portfolio Standard (RPS), which preempted CARB's 33 percent Renewable Electricity Standard. The new RPS applies to all electricity retailers in the state including publicly owned utilities (POUs), investor-owned utilities, electricity service providers, and community choice aggregators. These entities must adopt the new RPS goals of 20 percent of retail sales from renewables by the end of 2013, 25 percent by the end of 2016, and the 33 percent requirements by the end of 2020.

Clean Energy and Pollution Reduction Act of 2015, SB 350 (Chapter 547, Statutes of 2015) was approved by Governor Brown on October 7, 2015. SB 350 will: (1) increase the standards of the California RPS program by requiring that the amount of electricity generated and sold to retail customers per year from eligible renewable energy resources be increased to 50 percent by December 31, 2030; (2) require the State Energy Resources Conservation and Development Commission to establish annual targets for statewide energy efficiency savings and demand reduction that will achieve a cumulative doubling of statewide energy efficiency savings in electricity and natural gas final end uses of retail customers by January 1, 2030; (3) provide for the evolution of the Independent System Operator (ISO) into a regional organization; and (4) require the state to reimburse local agencies and school districts for certain costs mandated by the state through procedures established by statutory provisions. Among other objectives, the Legislature intends to double the energy efficiency savings in electricity and natural gas final end uses of retail customers through energy efficiency and conservation.

SB 862: In June 2014, SB 862 (Chapter 36, Statutes of 2014) established long-term funding programs from the Cap and Trade program for transit, sustainable communities and affordable housing, and high speed rail. SB 862 allocates 60 percent of ongoing Cap and Trade revenues, beginning in 2015–2016, to these programs. The remaining 40 percent is to be determined by future legislatures. A minimum of 25 percent of Cap and Trade dollars must go to projects that provide benefits to disadvantaged communities, and a minimum of 10 percent must go to projects located within those disadvantaged communities. In addition, this bill established the CalRecycle Greenhouse Gas Reduction Revolving Loan Program and Fund.

Senate Bills 32 and 350 and Executive Order B-30-15 (2015): Governor Brown signed Executive Order B-30-15 in 2015 in order to reduce GHG emissions by 40 percent below 1990 levels by 2030 to ensure California meets its target of reducing GHG emissions to 80 percent of 1990 levels by 2050. In particular, the Executive Order commissioned CARB to update the Climate Change Scoping Plan and the California Natural Resources Agency to update the state climate adaption strategy, Safeguarding California, every three years. The Safeguarding California Plan will identify vulnerabilities to climate change by sector and regions, including, at a minimum, the following sectors: water, energy, transportation, public health, agriculture, emergency services, forestry, biodiversity and habitat, and ocean and coastal resources; outline primary risks to residents, property, communities and natural systems from these vulnerabilities, and identify priority actions needed to reduce these risks; and identify a lead agency or group of agencies to lead adaptation efforts in each sector.

Assembly Bill 197: State Air Resources Board: Greenhouse Gases: AB 197 provides additional direction to CARB on the following areas related to the adoption of strategies to reduce GHG emissions. Additional direction in AB 197 meant to provide easier public access to air emissions data that are collected by CARB was posted in December 2016. AB 197 requires annual posting of GHG, criteria, and toxic air contaminant data throughout the State, organized by local and sub-county level for stationary sources and by at least a county level for mobile sources. AB197 also requires that when adopting rules and regulations to achieve emissions reductions to protect the State's most affected and disadvantaged communities, CARB shall consider the social costs of the emissions of GHGs, and prioritize emission reduction rules and regulations that result in direct emission reductions at large stationary sources of GHG emissions and direct emission reductions from mobile sources.

3.3.3.3 Local Regulations

The Air District established a climate protection program in 2005 to explicitly acknowledge the link between climate change and air quality. In November 2013, the Air District's Board of Directors adopted a resolution outlining greenhouse gas reduction goals of achieving an 80 percent reduction in GHG below 1990 levels and making a commitment to develop a regional climate protection strategy. The Air District regularly prepares inventories of GHG, criteria pollutants and toxic air contaminants to support planning, regulatory and other programs.

The District adopted a 10-point Climate Action Work Program in March 2014. The work program outlines the District's priorities in reducing GHG emissions that include: (1) establishing the goal of reducing GHG emissions 80 percent below 1990 levels by 2050; (2) updating the District's regional GHG emission inventory; (2) implementing GHG emissions monitoring; (4) developing a regional climate action strategy to meet the 2050 GHG emission reduction goal; (5) supporting and enhancing local actions through enhanced technical assistance to local governments in preparing local Climate Action Plans; (6) initiating rule development to enhance GHG reductions from sources subject to Air District regulations; (7) expanding enforcement of statewide regulations to reduce GHG emissions; (8) launching climate change and public health impacts initiative; (9) reporting progress to the public toward the 2050 goals and related performance objectives; and (10) exploring the Bay Area's energy future, including trends in fossil fuel demand and productions and exploring opportunities to promote the development of clean energy options.

In 2015, the Air District launched a GHG measurement program to provide the scientific basis that supports rulemaking and policy development for reducing GHG emissions. The program started monitoring GHGs in 2016 and includes a long-term fixed-site GHG monitoring network that measures concentrations of carbon dioxide, methane, and carbon monoxide at four sites. A dedicated mobile GHG monitoring research van also provides assistance in identifying emission hot spots and enhancing the regional emissions inventory.

Finally, the recently release 2017 Air Plan identifies control measures that include potential rules, programs, and strategies that the Air District can pursue to reduce GHG emissions in the Bay Area in support of the goals of reducing GHG emissions to 90 percent below 1990 levels by 2050.

3.3.3 THRESHOLDS OF SIGNIFICANCE

The most recently available BAAQMD draft CEQA guidelines established GHG thresholds for specific projects, general plans, and regional plans. An air quality rule does not fall neatly into any of these categories. Air Quality rules are typically regional in nature, as opposed to general plans, community plans and regional plans. In addition, air quality rules are usually specific to particular source types and particular pollutants.

The Air Quality Plan threshold of "no net increase in emissions" is appropriate for Air Quality Plans because they include a mix of several control measures with individual trade-offs. For example, one control measure may result in combustion of methane to reduce greenhouse gas emissions, while increasing criteria pollutant emissions by a small amount. Those increases from the methane measure would be offset by decreases from other measures focused on reducing criteria pollutants. In a particular rule development effort, there may not be opportunities to make these trade-offs.

The project level GHG threshold for stationary source projects is 10,000 metric tons of carbon dioxide equivalent (CO_2eq) emissions. This threshold is expected to capture approximately 95 percent of all GHG emissions from new permit applications from stationary sources within the jurisdiction of the Air District. The threshold level was calculated as an average of the combined CO_2 emissions from all stationary source permit applications submitted to the Air District during the three year analysis period (BAAQMD, 2010). The Air District is planning to develop significance thresholds specifically for rules. Until that effort is complete, the project-level GHG significance thresholds of 10,000 MT CO_2eq will be used to evaluate the cumulative GHG impact of each rule.

3.3.4 GHG EMISSION IMPACTS

GHG emissions impacts occur as a result of increased accumulation of GHGs in the atmosphere that may result in global climate change. Due to the complexity of conditions and interactions affecting global climate change, it is not possible to predict the specific impact, if any, attributable to GHG emissions associated with a single project. Although the geographic scope of this GHG emissions impact analysis in this EIR is the State of California, it is the cumulative effects of all global GHG emissions sources that have the potential result in global climate change. For this reason, GHG emission impacts contributing to global climate change are considered a cumulative impact analysis rather than a project-specific analysis.

With regard to potential GHG emission impacts, most GHG emissions sources at facilities that would be regulated by either Rule 11-18 or Rule 12-16 would include equipment or processes, primarily combustion sources that are part of the facilities' operations. Though the proposed project may include combustion processes that could generate GHG emissions such as CO_2, CH_4, and N_2O, the proposed project does not affect equipment or operations that have the potential to emit other GHGs such as sulfur hexafluoride (SF6), hydrofluorocarbon (HFC) or perfluorocarbon (PFC). GHGs could be emitted during construction activities to install air pollution control equipment from sources such as off-road construction equipment, which could be comprised of off-road mobile sources, e.g., bull dozers, cranes, forklifts, etc. GHGs could also be emitted during construction from on-road mobile sources such as haul trucks delivering products used in the pollution control process and construction worker commute trips. During operation GHG emission impacts could occur from air pollution control equipment that uses combustion as part of the control process. GHG emissions from existing facilities subject to either rule are part of the existing setting. Further, operational sources of GHG emissions are subject to the GHG emission reductions on the AB 32 Cap and Trade program. Therefore, existing sources of GHG emissions are not included as part of the GHG impacts analyzed in the following sections.

3.3.4.1 Potential GHG Emission Impacts During Construction

GHG emissions sources during construction to install air pollution control equipment would generally be the same types of sources as described in the construction criteria pollutant emission sources discussion in Section 3.2.4.1. Similar to the construction air quality impacts in Section 3.2.4.1, the analysis of potential GHG construction air quality impacts focuses on those types of air pollution control equipment that would produce the greatest construction emissions. Construction activities and equipment to install most other types of air pollution control equipment would tend to be substantially less than those identified in the following subsections.

Construction activities associated with installing air pollution control technologies would result in GHG emissions, although the amount generated by specific types of equipment can vary greatly as shown in Table 3.3-5. The estimated emissions for construction equipment operating on a typical eight-hour day are also provided in Table 3.3-5.

Discussions of GHG emission impacts described in the following subsections generally follow the format of construction emission impacts in Section 3.2.4.1, that is, by type of control technology. The following analyses of potential GHG use the same construction assumptions and scenarios.

TABLE 3.3-5

GHG Emission Estimates for Typical Construction Equipment Assuming an 8-Hour Operational Day (1)

Equipment Type	CO_2e (MT/hr)	CO_2e (MT/8-hr day)
Aerial Lifts- (Man Lifts)	0.01	0.09
Air Compressor	0.02	0.16
Bore/Drill Rigs	0.06	0.47
Concrete Pump	0.003	0.02
Concrete Saw	0.02	0.16
Crane	0.04	0.028
Excavator	0.03	0.26
Forklift	0.01	0.08
Generator	0.02	0.16
Grader	0.04	0.33
Pavers	0.03	0.23
Paving Equipment	0.02	0.2
Rollers	0.02	0.13
Rough Terrain Forklifts	0.02	0.17
Rubber Tired Dozers	0.05	0.42
Rubber Tired Loaders	0.04	0.31
Scrapers	0.09	0.75
Skid Steer Loaders	0.01	0.10
Surfacing Equipment	0.04	0.34
Tractors/Loaders/Backhoes	0.02	0.15
Trenchers	0.02	0.17
Welders	0.01	0.08

(1) Emission Factors from Off-Road 2011

3.3.4.1.1 Diesel ICEs – Both Rules

As indicated in Section 3.2.4.1.1, most facilities that would be subject to either Rule 11-18 or Rule 12-16 have diesel ICEs that are used as a backup source of electricity in the event of a power outage, or for refineries, as a means of pumping liquids between different refinery equipment. Operators generally have two options for reducing diesel ICE emissions, replacing a Tier 1 ICE with a new Tier 4 ICE or retrofitting the existing diesel ICE with a DPF or DOC. Table 3.3-6 estimates GHG emissions from replacing Tier 1 ICEs with Tier 4 ICEs and Table 3.3-7 estimates GHG emissions from retrofitting diesel ICEs with DPFs or DOCs.

TABLE 3.3-6

GHG Emissions During Construction Associated with Replacing ICEs

Activity	CO_2e MT/day [1]
Sub-total Off-road Construction Equipment	0.14
Sub-total On-road (Worker + Haul Truck) [2]	0.23
Total - 1 ICE Replacement	0.37
Rule 11-18 - 10 Replacements	3.7
Rule 12-16 - 5 Replacements	1.9
Both Rules - 15 Replacements	5.6

(1) Results are in metric tons per day because construction is assumed to last one day.
(2) See Appendix B for calculation details. Haul trucks are heavy heavy-duty diesel trucks.

TABLE 3.3-7

GHG Emissions During Construction Associated with Retrofitting ICEs [1]

Activity	CO_2e MT/day [2]
Sub-total Off-road Construction Equipment	1.81E-05
Sub-total On-road (Worker + Haul Truck) [2]	0.22
Total - 1 ICE Retrofit	0.22
Rule 11-18 - 10 Retrofit	2.3
Rule 12-16 - 5 Retrofit	1.1
Both Rules - 15 Retrofit	3.4

(1) See Appendix B for calculation details.
(2) Results are in metric tons per day because construction is assumed to last one day. Haul trucks are heavy heavy-duty diesel trucks.

3.3.4.1.2 Installing a Wet Gas Scrubber – Both Rules

As described in Section 3.2.4.1 construction GHG emissions to install a WGS, one of the largest types of air pollution control equipment that could be installed to comply with either Rule 11-18 or Rule 12-16, would occur over an 18-month period; one month to demolish any nearby existing equipment or structures and 17 months to construct the WGS. Demolition activities were assumed to require a construction crew of 50 workers and the use of one or more of the following types of equipment: crane, front-end loader, forklift, demolition hammer, water truck, medium-duty flatbed truck, etc. Constructing a WGS was assumed to require a construction crew of 175 workers and the use of one or more of the following types of construction equipment: backhoes, cranes, man lifts, forklift, front end loaders generators, diesel welding machines, jack hammers, a medium-duty flatbed truck, a medium-duty dump truck, a cement mixer, etc. GHG emissions from installing a WGS are shown in Table 3.3-8.

TABLE 3.3-8

GHG Emissions from Installing Wet Gas Scrubbers onto an FCCUs

Activity	CO2e MT [(1)]
Construction Activities for 1 WGS	468
Construction Emissions for 3WGS on Refinery Units	1,404
Construction Emissions for 5 WGS on Refinery Units	2,340

Source: BAAQMD, 2017

(1) MT values include construction and demolition emissions and are based on emissions during the entire construction period.

3.3.4.1.3 Installing a Selective Catalytic Reduction Unit – Rule 12-16 Only

The analysis of construction GHG emissions to install an SCR unit is included here because it would apply only to Rule 12-16 and is typically a large unit that would require substantial construction activities. SCR is typically considered to be BACT or BARCT to reduce NO_x emissions from large industrial combustion sources. Combustion sources at affected facilities that could be retrofitted with SCR include refinery FCCUs, boilers, process heaters, or gas turbines. However, such units are typically smaller compared to retrofitting an SCR onto an FCCU, so construction crews would be smaller and the overall duration of construction activities would be much shorter. Because retrofitting an SCR onto an FCCU would provide a more conservative analysis of construction air quality impacts than retrofitting an SCR onto refinery boilers, process heaters, or gas turbines, the following analysis focuses on quantifying construction emissions from installing an SCR onto an FCCU. The GHG construction emissions analysis uses the same construction assumptions and construction scenarios that were used in Section 3.2.4.1. GHG emissions from installing an SCR onto an FCCU are shown in Table 3.3-9

TABLE 3.3-9

GHG Emissions from Installing Selective Catalytic Reduction Units onto an FCCU [(1)]

Activity	CO_2e MT [(2)]
Sub-total Off-road Construction Equipment	195
Sub-total On-road (Worker + Haul Truck) [(3)]	379
Construction Emissions for 1 SCR on an FCCU	574
Construction Emissions for 3 SCRs on an FCCU	1,722

(1) See Appendix B for calculation details.

(2) MT values include construction and demolition emissions and are based on emissions during the entire construction period.

(3) Haul trucks are heavy heavy-duty diesel trucks.

3.3.4.1.4 Installing a Carbon Adsorption Unit – Rule 11-18 Only

As indicated in Section 3.2.4.1, the most likely TAC emission sources that would be subject to Rule 11-18 and that could be controlled using carbon adsorption units are expected to be sewage treatment facilities because various stages of the sewage treatment process produce ROG emissions that may include TAC components. The GHG construction air quality analysis for installing a carbon adsorption unit is based on a construction emissions analysis from installing air pollution control equipment similar in size to a carbon adsorption unit because no actual carbon adsorption construction scenarios were identified. Construction assumptions and parameters associated with installing a carbon adsorption unit are the same as those used in Subsection 3.2.4.1.4. Table 3.3-10 shows the expected construction GHG emissions from installing carbon adsorption units.

TABLE 3.3-10

GHG Emissions During Construction of Carbon Adsorption Units (1)

Activity	CO_2e MT (2)
Sub-total Off-road Construction Equipment	72
Sub-total On-road (Worker + (3))	72
Construction Emissions for 1 Carbon Adsorption Unit	148
Construction Emissions for 5 Carbon Adsorption Unit	742

(1) See Appendix B for calculation details.
(2) MT values include construction and demolition emissions and are based on emissions during the entire construction period.
(3) Haul trucks are heavy heavy-duty diesel trucks.

3.3.4.1.5 Summary of Construction Emission Impacts

As demonstrated in the subsections above, construction and installation of some types of air pollution control technologies would not necessarily be expected to result in substantial GHG air quality impacts during construction. For example, replacing existing diesel ICEs with Tier 4 ICEs or retrofitting diesel ICEs with DPFs of DOCs could occur if either Rule 11-18 or Rule 12-16 is adopted. For either control scenario, GHG emissions would be relatively low and would only be expected to occur on a single day. As shown in Tables 3.3-6 and 3.3-7, GHG air quality impacts during construction from installing new, or retrofitting existing diesel ICEs would be greater under Rule 11-18 than under Rule 12-16 because substantially more industrial facilities that have diesel ICEs would be regulated under Rule 11-18. GHG air quality impacts during construction would be greater still if more than one diesel ICE is replaced or retrofitted on the same day or both rules are adopted.

Demolition and construction GHG emissions impacts from installing a single large-scale air pollution control unit, a single WGS for example, which could take up to 18 months to complete demolition and construction, is one type of air pollution control equipment that has the potential to produce substantial construction GHG emissions. Construction activities for smaller types of air pollution control equipment such as carbon adsorption units that may be installed under Rule 11-18 or SCRs that may be installed under Rule 12-16, would have lower GHG emissions, but they could still be substantial, especially if more than unit is installed at the same time.

As summarized in Table 3.2-11, Rule 11-18 and Rule 12-16, respectively, could produce GHG air quality impacts during construction if larger types of air pollution control equipment are installed. These potential GHG emission impacts would be compounded if more than one piece of air pollution control equipment is installed on the same day or both rules are adopted. Again, because Rule 11-18 would potentially regulate a substantially greater number of industrial sources, it would create greater GHG air quality impacts during construction than Rule 12-16.

TABLE 3.3-11

Worst-Case Construction GHG Emissions Under Both Rules

Activity	CO_2e MT
Peak Construction GHG Emissions Under Rule 11-18	
Total Construction Emissions for 10 Diesel ICE Replacement	3.7
Total Construction Emissions for 10 Diesel ICE Retrofit	2.3
Total Construction Emissions for 5 WGS	2,340
Total Construction Emissions for 5 Carbon Adsorption	742
Total Potential Overlapping GHG Emissions	3,088
Total Potential Overlapping GHG Emissions (Amortized)(1)	103
Peak Construction GHG Emissions Under Rule 12-16	
Total Construction Emissions for 5 Diesel ICE Replacement	1.9
Total Construction Emissions for 5 Diesel ICE Retrofit	1.1
Total Construction Emissions for 5 WGS	2,340
Construction Emissions for 3 SCRs on an FCCU	1,722
Total Potential Overlapping GHG Emissions	4,065
Total Potential Overlapping GHG Emissions (Amortized)(1)	136

(1) Amortized over 30 years. MT/yr

The Air District does not have an adopted threshold of significance for construction-related GHG emissions. However, since GHG emissions are cumulative and construction emission are short-lived, the total construction GHG emissions are amortized over 30 years to create an annual emission rate that is combined with the operational GHG emissions for determining significance. The operational GHG emission analysis and significance determination are presented in the following sections.

3.3.4.2 Potential GHG Emission Impacts During Operation

The analysis of operational GHG emission impacts from the proposed project would include direct GHG emissions from air pollution control equipment and indirect emissions, e.g., haul truck emissions from transporting fresh supplies of caustic. Table 3.3-12 shows air pollution control technologies that would be the most likely technologies installed at affected facilities to reduce TAC emissions under Rule 11-18 and GHG, NOx, SO_2, PM_{10}, and PM2.5 emissions under Rule 12-16 and that may have the potential to generate direct or indirect GHG emission impacts during operation. The subsections below evaluate those air pollution control technologies identified in Table 3.3-12 that have the potential to generate adverse direct or indirect operational GHG emission impacts. Air pollution control technologies where no direct or indirect operational GHG emission impacts were identified will not be discussed further.

TABLE 3.3-12

Potential Operational GHG Impacts from Installing Air Pollution Control Equipment

Applicable Rule	Potential Control Technology	GHG Impacts	Analyzed Further?
11-18 & 12-16	Baghouse with HEPA Filters	None identified	**No**
11-18	Carbon Adsorption	Combustion emissions from regenerating spent carbon	**Yes**
12-16	Compressor	None identified	**No**
12-16	Cyclone	None identified	**No**
11-18 & 12-16	Diesel Oxidation Catalyst	None identified	**No**
11-18 & 12-16	Diesel Particulate Filter	None identified	**No**
12-16	Electrostatic Precipitator (Wet and Dry)	None identified	**No**
12-16	Fuel Gas Treatment (Additive to Existing Amine System)	None identified	**No**
12-16	Fuel Gas Treatment (Merox)	None identified	**No**
12-16	LoTOx™	None identified	**No**
11-18 & 12-16	New Diesel ICEs	None identified	**No**
12-16	Selective Catalytic Reduction	Indirect mobile source emission increases	**Yes**
12-16	Selective Oxidation Catalyst	None identified	**No**
11-18	Steam Ejector Technology	None identified	**No**
12-16	SOx Reducing Additive	None identified	**No**
11-18	Thermal Oxidizer	Potential increase in combustion emissions	**Yes**
12-16	Ultracat	Indirect mobile source emission increases	**Yes**
11-18 & 12-16	Wet Gas Scrubber	Indirect mobile source emission increases. Increased electricity.	**Yes**

3.3.4.2.1 GHG Emissions from Regenerating Spent Carbon (Rule 11-18 Only)

As indicated in Table 3.3-12, a carbon adsorption unit is one type of control technology that has the potential to generate GHG emissions. Chapter 3, Subsection 3.2.4.2.1 describes the operation of carbon adsorption units and notes that, once the bed of activated carbon becomes saturated, it is typically regenerated by raising the temperature of the carbon, evacuating the bed, or both. Regenerating spent carbon typically requires a combustion source using natural gas as the combustion fuel to heat the regenerant and/or to heat the carbon beds. This process of regenerating spent carbon is the point where GHG emissions would be generated.

The assumptions used to calculate criteria pollutant emissions from carbon adsorption units are used in this analysis. Carbon adsorption units are regenerated four times per day and 0.062 scfm/day of natural gas is used as the combustion fuel. Table 3.3-13 shows annual GHG emission impacts from regenerating spent carbon.

TABLE 3.3-13

Annual GHG Emissions from Carbon Adsorption Units

	Metric Tons/Year			
Number of Units	CH_4	N_2O	CO_2	CO_2e
1 Unit	0.02	0.01	1,231.56	1,234
5 Units	0.12	0.03	6157.82	6,172

CO_2, N_2O and CH_4 emission factors from AP-42 Table 1.4-2, July 1998

3.3.4.2.2 GHG Emissions from Thermal Oxidizers (Rule 11-18 Only)

As indicated in Chapter 3.2, Subsection 3.2.4.2.3, it is expected that thermal oxidizers would be used to control TAC emissions primarily at landfills and sewage treatment facilities. As part of its CEQA evaluation of BAAQMD Regulation 2, Rule 5, the Air District prepared an Initial Study/Negative Declaration (BAAQMD, 2016a). That CEQA document also identified thermal oxidizers as a potential air pollution control device that could be used to reduce TAC emissions. The document also includes an analysis of potential GHG emission impacts from thermal oxidizers. That analysis concluded that operation of one thermal oxidizer has the potential to generate 910.1 metric tons of CO_2e per year. Since Rule 11-18 is also designed to reduce TAC emissions, the analysis of GHG emissions from thermal oxidizers in the Initial Study/Negative Declaration would be applicable to this analysis. Since it is assumed that up to five thermal oxidizers could be installed to comply with the risk reduction requirements in Rule 11-18, annual GHG emissions could be as much as 4,550.5 metric tons of CO_2e per year.

3.3.4.2.3 Indirect Mobile Source Emissions

Several types of air pollution control devices identified in Table 3.3-12 use specific substances to assist with the emission reduction process. For example, SCR promotes chemical reactions in the presence of a catalyst. As a result, SCRs would require delivery of ammonia or urea to the facilities where they are installed. It is estimated that about 40 truck trips per year would be required for the delivery of ammonia/urea to each facility with an SCR. This amount could vary depending on the size of the SCR and size of the ammonia or urea storage systems. However, 40 trucks per year per facility is assumed to provide a conservative estimate of transportation requirements.

Similar to SCRs, WGS units use NaOH as a caustic solution to reduce emissions. Catalyst and caustic solutions are typically used in relatively small amounts per day. Indirect emission impacts could also occur from haul trucks associated with delivering supplies (i.e., fresh catalyst and caustic solution to refill the storage tanks) on a regular basis. Depending on the size and configuration of the WGS, the NaOH caustic solution used in the WGS would likely need to be delivered one time per week or a little over 50 additional delivery truck trips per year.

Haul truck trips transporting ammonia or NaOH caustic would occur relatively infrequently and it is not likely that all affected facilities would transport materials on the same day. However, GHG emissions are quantified on an annual basis so all truck trips would contribute to GHG emission impacts. GHG emission impacts from truck transport trips carrying materials for SCRs and WGS units are shown in Table 3.3-14.

TABLE 3.3-14

Annual GHG Emissions from Delivery Truck Trips

Material	Number of Truck Trips	Trip Length (Roundtrip miles	CO2e
Peak Operational Emissions One Facility (Metric Tons/Day)			
Caustic/Catalyst for WGS Unit	2	120	0.23
Ammonia for SCR	2	100	0.20
Total			0.43
Peak Operational Emissions One Facility (Metric Tons/year)			
Caustic/Catalyst for WGS Unit	104	120	24
Ammonia for SCR	80	100	16
Total			40
Peak Operational Emissions Multiple Facilities (Metric Tons/year)			
Caustic/Catalyst for WGS 5 Units	520	120	121
Ammonia for SCR 3 Units	240	100	47
Total			168

Source, BAAQMD, 2017

3.3.4.2.4 Indirect Emissions from Electricity Generation

Electricity is often used as the power source to operate various components of add-on control equipment, such as ventilation systems, fan motors, vapor recovery systems, etc. Increased demand for electrical energy may require generation of additional electricity, which in turn could result in increased GHG emissions in the Bay Area and in other portions of California. For example, installing WGS may increase pressure drop in the flue gas system. Similarly, installing an SCR may also increase pressure drop in the flue gas system. Additional power may be needed to compensate for this additional pressure drop.

The production of electricity to operate the WGS units or SCRs would generate GHG emissions. The estimated GHG emission increase associated with increased electricity use for WGS units and SCRs is shown in Table 3.3-15.

TABLE 3.3-15

GHG Emissions from Electricity Use at Wet Gas Scrubbers

Control Equipment	Number of Units	Potential Increased Electricity Demand (MWhr/yr	Emission Factor (lb/MWhr) (1)	Emissions ($CO2_e$ MT/yr)
WGS	5	1,305	644	381
SCR	3	665.7	644	194
Maximum Total				575

Source: BAAQMD, 2017
(1) CAPCOA, 2016. Based on PG&E emission factors from CalEEMod.

3.3.4.2.5 Summary of Operational GHG Emissions

Based on the evaluation of those air pollution control technologies that would most likely be the used to reduce NOx, SO_2, PM2.5, and TAC emissions from affected facilities if required pursuant to Rule 11-18 or Rule 12-16, respectively, potential operational GHG impacts from the proposed project could occur, driven primarily by installation of WGS units and carbon adsorption units. Some indirect mobile sources from delivering materials necessary for the pollution control process would also occur under both rules. Table 3.3-16 summarizes the GHG emission impacts for each rule.

CARB's Cap and Trade program was designed to reduce GHG emissions from major sources (covered entities) by setting a firm cap on statewide GHG emissions while employing market mechanisms to cost-effectively achieve the GHG emission-reduction goals. The Cap and Trade program relies on data collected through the Mandatory Reporting of Greenhouse Gas Emissions Regulation (MRR) and required affected facilities to report their annual GHG emissions in 2009 and every year thereafter. Further, under the Cap and Trade program, individual facilities do not receive individual facility-wide caps, but industrial sectors receive allowances. The sectors include electricity, transportation fuels, oil and gas processing, and other general industrial facilities. Since, there is no specific information as to where control equipment would be required, it would be speculative to assume that GHG emissions would be offset under AB 32 Cap and Trade.

TABLE 3.3-16

Worst-Case Operational GHG Emissions Under Both Rules

Activity	CO_2e MT/Year
Peak Operational GHG Emissions Under Rule 11-18	
Total Amortized Construction Emissions	103
Total Operational Emissions for 5 Carbon Adsorption Units	6,172
Total Operational Emissions 5 Thermal Oxidizers	4,551
Total Haul Truck Emissions for 5 WGS Units	121
Total Electrical Emissions for 5 WGS Units	381
Total Potential Overlapping GHG Emissions	11,328
Significance Threshold	10,000 MT/yr
Significant?	**Yes**
Peak Operational GHG Emissions Under Rule 12-16	
Total Amortized Construction Emissions	136
Total Haul Truck Emissions for 5 WGS Units	121
Total Haul Truck Emissions for 3 SCRs	47
Total Electrical Emissions for 5 WGS Units	381
Total Electrical Emissions for 3 SCR Units	194
Total Potential Overlapping GHG Emissions	879
Significance Threshold	10,000 MT/yr
Significant?	No

3.3.4.3 Potential Conflicts With State GHG Compliance Plans

The NOP/IS for the proposed project noted that CARB's Cap and Trade program allows covered facilities to buy and sell GHG emissions credits, while Rule 12-16 would not allow Bay Area refineries to purchase GHG credits to demonstrate compliance with the refinery-wide GHG limit. As a result, Rule 12-16 has the potential to conflict with CARB's Cap and Trade program, which was adopted for the purpose of reducing GHG emissions throughout California.

As explained above, CARB's Cap and Trade program was designed to reduce GHG emissions from major sources (covered entities) by setting a firm cap on statewide GHG emissions while employing market mechanisms to cost-effectively achieve the GHG emission-reduction goals. The Cap and Trade program relies on data collected through the Mandatory Reporting of Greenhouse Gas Emissions Regulation (MRR) and required affected facilities to report their annual GHG emissions in 2009 and every year thereafter. Further, under the Cap and Trade program, individual facilities do not receive individual facility-wide caps, but industrial sectors receive allowances (see next paragraph regarding allowances). The statewide cap for GHG emissions from major sources, which is measured in metric tons of carbon dioxide equivalent (MTCO2e), commenced in 2013 and has declined over time, achieving GHG emission reductions throughout the program's duration. The statewide cap for GHG emissions from major sources commenced in 2013 at about two percent below the emissions level forecast for 2012, it declined about two percent in 2014, and then declines about three percent annually from 2015 to 2020, thus, achieving GHG emission reductions throughout the program's duration.

Proposed Rule 12-16 would establish GHG emission limits on refineries and refinery-dependent businesses in the Bay Area. Based on annual GHG emissions for each affected facility from the year 2012 through 2015, the latest year information is available, no facility exceeded its currently proposed Rule 12-16 GHG limits for any year in which data are available. However, these years also were years of relatively low gasoline consumption in California. Total gasoline consumption in the state peaked in 2004 and then declined 8.94 percent between 2004 and 2012, per data from the California Energy Commission. Gasoline consumption has been increasing every year since then. If gasoline consumption continues to increase, the limits in Rule 12-16 may prevent Bay Area refineries from increasing production to meet demand. This scenario could cause conflicts with GHG and perhaps result in increased GHG emissions outside the Bay Area due to the manufacture of transportation fuels being shifted elsewhere.

The data in Table 3.3-17, indicates that Rule 12-16 would not be expected to conflict with CARB's Cap and Trade program because covered entities could continue to use GHG credits for compliance purposes. That data may not be predictive of future scenarios; however, it is the only data available at this time. Presuming continuing increases in gasoline consumption results in unreasonable levels of speculation. For example, it is impossible for the Air District to predict the exact level of gasoline consumption in 2018 and how that would relate to Bay Area refinery capacity and how the market might react if production at Bay Area refineries were constrained by Rule 12-16. Therefore, the Air District is assuming, based on historical data that potential GHG emission impacts under Rule 12-16 would not conflict with California's GHG compliance plan established under AB32 and these impacts are concluded to be less than significant.

TABLE 3.3-17

Annual GHG Emission Inventories for Facilities Subject to Rule 12-16 (CO_2e in metric tons/year)

Facility	2012 GHG Inventory	2013 GHG Inventory	2014 GHG Inventory	2015 GHG Inventory	Proposed Rule 12-16 GHG Limit
Chevron Richmond	4,126,095	4,087,322	4,120,931	4,420,335	4,774,356.00
Shell Martinez	4,366,858	4,191,585	3,968,978	4,131,880	4,559,540.00
Phillips 66 San Francisco	1,320,965	1,363,918	1,276,578	1,320,782	1,607,925.00
Tesoro Martinez	2,089,720	2,445,615	2,334,466	2,056,107	2,615,047.00
Valero Benicia	2,939,902	2,738,051	2,710,549	2,839,357	3,145,008.00
Martinez Cogen LP	413,261	386,217	411,584	401,277	450,633.00
Air Liquide H2 Rodeo	770,858	884,931	815,746	819,886	946,876.00
Air Products H2 Martinez	217,135	270,753	255,203	196,728	289,706.00

3.3.4.4 Conclusion

Evaluation of those air pollution control technologies that would most likely be used to reduce TAC, NOx, SO_2, PM, and GHG emissions from affected facilities, if required pursuant to Rule 11-18 or Rule 12-16, respectively, indicates that Rule 11-18 could generate direct and indirect GHG emission impacts that exceed the Air District's operational GHG emissions significance threshold of 10,000 $MTCO_2e$/yr. However, direct and indirect GHG emission impacts for Rule 12-16 are less than the Air District's GHG significance threshold and, therefore, are concluded to be less than significant. Therefore, because the analysis of GHG emission impacts is by definition a cumulative impact analysis, cumulative operational GHG emission impacts for Rule 11-18 are concluded to be significant, but less than significant for Rule 12-16. However, if both rules are adopted, cumulative GHG emission impacts would be greater than either rule alone and, therefore, would be significant.

3.3.5 MITIGATION MEASURES

Measures to mitigate operational GHG emission impacts typically rely on energy efficiency measures. Improving energy efficiency is equipment- and operation-specific, so each affected facility operator would have to perform a facility-wide evaluation to determine appropriate energy efficiency measures. Such an analysis is outside the scope of the environmental analysis for the proposed project. However, there are programs in California designed to reduce GHG emissions statewide. For example, CARB has designed a California Cap and Trade program that is enforceable and meets the requirements of AB 32. The program began on January 1, 2012, with an enforceable compliance obligation beginning with the 2013 GHG emissions inventory. The refineries are subject to the requirements of the AB32 Cap and Trade Program and have a GHG allocation based on current GHG emissions levels. The AB32 Cap and Trade Program has divided allocations into sectors and established a Refinery Sector allocation. Sectors that are subject to the Cap and Trade program include large industrial facilities emitting 25,000 $MTCO_2e$ in the following sectors: petroleum refining, petroleum and natural gas systems, hydrogen production iron and steel production, in-state electricity generators, etc.

Under the Cap and Trade program, individual facilities do not receive individual facility-wide caps, but industrial sectors receive allowances. An allowance is a tradable permit to emit one metric ton of a carbon dioxide equivalent GHG emissions. Allowances are distributed among facilities based on their complexity and energy efficiency. The more energy efficient a facility is, the greater the allocation it receives. For example, according to the operational GHG analysis above, the primary source of GHG emission impacts would be refineries. The refinery allowance process includes both on-site generated and third-party power. Further, the AB32 Cap and Trade Program requires that the refineries subject to the program (including all refineries in the Bay Area) to offset any GHG emissions in excess of the total allowance obtained through the program. As the emissions cap is gradually reduced over time, and as additional sources are brought under the cap to include the vast majority of GHG emissions in the State, the program will ensure that California remains on track to continually reduce GHG emissions and meet the 2020 limit. Operational GHG emission increases would be offset if they occurred at facilities that are included in the Cap and Trade Program. However, since there is no specific information as to where the air pollution control equipment would occur it would be speculative to assume that GHG emissions would be offset under the AB 32 Cap and Trade Program at this time. Nonetheless, some or all of the GHG emissions that may be generated to comply with Regulations 11-18 and 12-16 would be offset under the Cap and Trade Program.

3.3.5.2 Remaining Operational Impacts

Since the GHG emissions reductions expected from implementing AB 32 are speculative, cumulative GHG emission impacts are expected to remain significant for: (1) implementing Rule 11-18 alone; and (2) implementing both Rules 11-18 and 12-16 together. The cumulative GHG emissions impacts are expected to be less than significant for implementing Rule 12-16 alone.

CHAPTER 3.4

HAZARDS AND HAZARDOUS MATERIALS

Introduction
Environmental Setting
Regulatory Setting
Significance Thresholds
Environmental Impacts
Mitigation Measures
Cumulative Impacts

3.4 HAZARDS AND HAZARDOUS MATERIALS

This subchapter of the EIR evaluates the potential hazards and hazardous material impacts associated with implementation of Rules 11-18 and/or 12-16. Rule 12-16 would establish numeric emission limits on specific refinery and associated facilities within the Bay Area. Rule 11-18 would reduce exposure to TAC emissions from a number of stationary sources within the Bay Area, including refineries.

As discussed in the Initial Study, implementation of Rule 11-18 would reduce risk from facilities that emit toxic air contaminants throughout the Bay Area. Risk reduction measures are expected to be limited to new air pollution control equipment and construction of enclosures. The NOP/IS concluded that wet gas scrubbers were not expected to be used to control TACs; therefore, implementation of Rule 11-18 was not expected to result in a substantial hazard and hazardous material impacts. However, public comments received on the NOP/IS indicated that wet gas scrubbers could be used to control TAC emissions for certain units at refineries. Thus, potential hazards and hazardous material impacts are included in this EIR for proposed Rule 11-18.

Implementation of Rule 12-16 would prevent refinery emissions of GHGs and some criteria pollutants from increasing. However, Rule 12-16 could require the installation of additional air pollution control equipment or modifications to refinery operations. In particular, NOx emission reduction measures could result in the increased use of ammonia, which is a hazardous material, in selective catalytic reduction units and Ultracat catalyst filters. The NOP/IS (see Appendix A) determined potential hazards and hazardous material impacts associated with the implementation of the proposed new Rule 12-16 are potentially significant. The, project-specific and cumulative adverse hazards and hazardous material impacts associated with implementation of proposed Rules 11-18 and 12-16 have been evaluated in Chapter 3.4 of this EIR.

3.4.1 ENVIRONMENTAL SETTING

The potential for hazards exist in the production, use, storage and transportation of hazardous materials. Hazardous materials may be found at industrial production and processing facilities. Some facilities produce hazardous materials as their end product, while others use such materials as an input to their production process. Examples of hazardous materials used as consumer products include gasoline, solvents, and coatings/paints. Hazardous materials are stored at facilities that produce such materials and at facilities where hazardous materials are a part of the production process. Specifically, storage refers to the bulk handling of hazardous materials before and after they are transported to the general geographical area of use. Currently, hazardous materials are transported throughout the district in great quantities via all modes of transportation including rail, highway, water, air, and pipeline.

The potential hazards associated with industrial activities are a function of the materials being processed, processing systems, and procedures used to operate and maintain the facility. The hazards that are likely to exist are identified by the physical and chemical properties of the materials being handled and their process conditions, including the following events:

- **Toxic gas clouds:** Toxic gas clouds are releases of volatile chemicals (e.g., anhydrous ammonia, chlorine, and hydrogen sulfide) that could form a cloud and migrate off-site, thus exposing individuals. "Worst-case" conditions tend to arise when very low wind speeds coincide with an accidental release, which can allow the chemicals to accumulate rather than disperse.

- **Torch fires (gas and liquefied gas releases), flash fires (liquefied gas releases), pool fires, and vapor cloud explosions (gas and liquefied gas releases):** The rupture of a storage tank or vessel containing a flammable gaseous material (like propane or gasoline), without immediate ignition, can result in a vapor cloud explosion. The "worst-case" upset would be a release that produces a large aerosol cloud with flammable properties. If the flammable cloud does not ignite after dispersion, the cloud would simply dissipate. If the flammable cloud were to ignite during the release, a flash fire or vapor cloud explosion could occur. If the flammable cloud were to ignite immediately upon release, a torch fire would ensue.

- **Thermal Radiation:** Thermal radiation is the heat generated by a fire and the potential impacts associated with exposure. Exposure to thermal radiation would result in burns, the severity of which would depend on the intensity of the fire, the duration of exposure, and the distance of an individual to the fire.

- **Explosion/Overpressure:** Process vessels containing flammable explosive vapors and potential ignition sources are present at industrial facilities, e.g., refineries and chemical plants. Explosions may occur if the flammable/explosive vapors came into contact with an ignition source. An explosion could cause impacts to individuals and structures in the area due to overpressure.

3.4.1.1 Hazardous Materials Incidents

The Department of Transportation, Office of Pipeline and Hazardous Materials Safety Administration (PHMSA) utilizes a post incident reporting system that collects data on incidents involving accidents. Information on accidental releases of hazardous materials are reported to PHMSA. In 2015, 1,489 hazardous materials incidents that occurred within California were reported to PHMSA. The incidents resulted in 295 non-hospitalized injuries, 94 people hospitalized, 11 fatalities, and approximately $107 million in damages (PHMSA, 2016).

In the last ten years, 42 hazardous materials incidents related to anhydrous or aqueous ammonia that occurred within California have been reported to PHMSA. Six of those incidents occurred in the Bay Area. The Bay area incidents resulted in no injuries (hospitalized or non-hospitalized) and caused about $5,200 in damages (PHMSA, 2016).

The California Hazardous Materials Incident Reporting System (CHMIRS) is a post incident reporting system to collect data on incidents involving the accidental release of hazardous materials. Information on accidental releases of hazardous materials are reported to and maintained by Cal EMA. While information on accidental releases are reported to Cal EMA, Cal EMA no longer conducts statistical evaluations of the releases. PHMSA provides access to retrieve data from the Incident Reports Database, which also includes non-pipeline incidents, e.g., truck and rail events. Incident data and summary statistics, e.g., release date geographical location (state and county) and type of material released, are available online from the Hazmat Incident Database.

Table 3.4-1 provides a summary of the reported hazardous materials incidents in the nine counties within the Bay Area. In 2015, there were a total of 1,272 incidents reported in the nine counties regulated by the BAAQMD (see Table 3.4-1), with the most incidents (292) reported in Alameda County, followed by Contra Costa County (248).

TABLE 3.4-1

Hazardous Materials Incidents 2015 by County

COUNTY	REPORTED INCIDENTS
Alameda	292
Contra Costa	248
Marin	70
Napa	22
San Francisco	90
San Mateo	108
Santa Clara	198
Solano*	134
Sonoma*	110
Total No. of Reported Incidents	1,272

Source: OES, 2016
* Not all of Solano or Sonoma Counties are within the jurisdiction of BAAQMD

The location of the spills varies (see Table 3.4-2). In the nine counties that comprise the Air District, hazardous materials incidents during transportation, at waterways, and at commercial facilities were the most common locations, respectively, for hazardous materials incidents. About 17 percent of the hazardous materials incidents that occurred within California occurred within the nine counties that comprise the Bay Area, with spills in industrial areas the most common (27 percent), followed by waterways (22 percent) and commercial areas (20 percent).

TABLE 3.4-2

Hazardous Materials Incidents 2015

Spillsite	BAAQMD	Statewide	Percent of State Total
Waterways	160	734	22%
Transportation	480	2843	17%
Industrial	81	298	27%
Commercial	266	1364	20%
Residential	162	895	18%
Utilities	26	194	13%
Military	1	61	2%
Other	96	928	10%
Total	**1,272**	**7,317**	**17%**

Source: OES, 2016

3.4.1.2 Potential Hazards Associated with Air Pollution Control Equipment

The BAAQMD has evaluated the hazards associated with previous air plans (2010 Clean Air Plan) and proposed BAAQMD rules. The analyses covered a range of potential air pollution control technologies and equipment. EIRs prepared for the previous rules and air plans have specifically evaluated hazard impacts from add-on pollution control equipment.

Add on pollution control technologies include carbon adsorption, incineration, post-combustion flue-gas treatment, SCR and selective non-catalytic reduction, scrubbers, bag filters and electrostatic precipitators. The use of add-on pollution control equipment may concentrate or utilize hazardous materials. A malfunction or accident when using add-on pollution control equipment could potentially expose people to hazardous materials, explosions, or fires. The transport, use, and storage of ammonia, both aqueous and anhydrous (used in SCR systems), may result in a release in the event of an accident. Previous studies have indicated that the use of aqueous ammonia (instead of anhydrous ammonia) can usually reduce the hazards associated with ammonia use in SCR systems.

3.4.2 REGULATORY SETTING

There are many federal and state rules and regulations for handling hazardous materials, which serve to minimize the potential impacts associated with hazards.

3.4.2.1 Federal Regulations

The U.S. EPA is the primary federal agency charged with protecting human health and with safeguarding the natural environment from pollution into air, water, and land. The U.S. EPA works to develop and enforce regulations that implement environmental laws enacted by Congress. The U.S. EPA is responsible for researching and setting national standards for a variety of environmental programs, and delegates to states and Indian tribes the responsibility for issuing permits and for monitoring and enforcing compliance. Since 1970, Congress has enacted numerous environmental laws that pertain to hazardous materials, for the U.S. EPA to implement as well as to other agencies at the federal, state and local level, as described in the following subsections.

3.4.2.1.1 Hazardous Materials and Waste Regulations

Resource Conservation and Recovery Act: The Resource Conservation and Recovery Act (RCRA) of 1976 authorizes the U.S. EPA to control the generation, transportation, treatment, storage, and disposal of hazardous waste. RCRA considers materials and waste to be hazardous based on four characteristics: ignitability, corrosivity, reactivity, and toxicity. Under RCRA regulations, hazardous wastes must be tracked from the time of generation to the point of disposal. In 1984, RCRA was amended with addition of the Hazardous and Solid Waste Amendments, which authorized increased enforcement by the U.S. EPA, stricter hazardous waste standards, and a comprehensive underground storage tank program. Likewise, the Hazardous and Solid Waste Amendments focused on waste reduction and corrective action for hazardous releases. The use of certain techniques for the disposal of some hazardous wastes was specifically prohibited by the Hazardous and Solid Waste Amendments. Individual states may implement their own hazardous waste programs under RCRA, with approval by the U.S. EPA. California has been delegated authority to operate its own hazardous waste management program.

Comprehensive Environmental Response, Compensation and Liability Act: The Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), which is often commonly referred to as Superfund, is a federal statute that was enacted in 1980 to address abandoned sites containing hazardous waste and/or contamination. CERCLA was amended in 1986 by the Superfund Amendments and Reauthorization Act, and by the Small Business Liability Relief and Brownfields Revitalization Act of 2002.

CERCLA contains prohibitions and requirements concerning closed and abandoned hazardous waste sites; establishes liability of persons responsible for releases of hazardous waste at these sites; and establishes a trust fund to provide for cleanup when no responsible party can be identified. The trust fund is funded largely by a tax on the chemical and petroleum industries. CERCLA also provides federal jurisdiction to respond directly to releases or impending releases of hazardous substances that may endanger public health or the environment.

CERCLA also enabled the revision of the National Contingency Plan (NCP) which provided the guidelines and procedures needed to respond to releases and threatened releases of hazardous substances, pollutants, or contaminants. The NCP also established the National Priorities List, which identifies hazardous waste sites eligible for long-term remedial action financed under the federal Superfund program.

Prevention of Accidental Releases and Risk Management Programs: Requirements pertaining to the prevention of accidental releases are promulgated in §112 (r) of the CAA Amendments of 1990 [42 U.S.C. §7401 et. seq.]. The objective of these requirements was to prevent the accidental release and to minimize the consequences of any such release of a hazardous substances. Under these provisions, facilities that produce, process, handle or store hazardous substances have a duty to: 1) identify hazards which may result from releases using hazard assessment techniques; 2) design and maintain a safe facility and take steps necessary to prevent releases; and, 3) minimize the consequence of accidental releases that occur.

In accordance with the requirements in §112 (r), U.S. EPA adopted implementing guidelines in 40 CFR Part 68. Under this part, stationary sources with more than a threshold quantity of a regulated substance shall be evaluated to determine the potential for and impacts of accidental releases from any processes subject to the federal risk management requirements. Under certain conditions, the owner or operator of a stationary source may be required to develop and submit a Risk Management Plan (RMP). RMPs consist of three main elements: a hazard assessment that includes off-site consequences analyses and a five-year accident history, a prevention program, and an emergency response program. At the local level, RMPs are implemented by the local fire departments.

3.4.2.1.2 Emergency Planning and Community Right-to-Know Act

The Emergency Planning and Community Right-to-Know Act (EPCRA) is a federal law adopted by Congress in 1986 that is designed to help communities plan for emergencies involving hazardous substances. EPCRA establishes requirements for federal, state and local governments, Indian tribes, and industry regarding emergency planning and "Community Right-to-Know" reporting on hazardous and toxic chemicals. The Community Right-to-Know provisions help increase the public's knowledge and access to information on chemicals at individual facilities, their uses, and releases into the environment. States and communities, working with facilities, can use the information to improve chemical safety and protect public health and the environment. There are four major provisions of EPCRA:

1. Emergency Planning (§§301 – 303) requires local governments to prepare chemical emergency response plans, and to review plans at least annually. These sections also require state governments to oversee and coordinate local planning efforts. Facilities that maintain Extremely Hazardous Substances (EHS) onsite (see 40 CFR Part 355 for the list of EHS chemicals) in quantities greater than corresponding “Threshold Planning Quantities” must cooperate in the preparation of the emergency plan.

2. Emergency Release Notification (§304) requires facilities to immediately report accidental releases of EHS chemicals and hazardous substances in quantities greater than corresponding Reportable Quantities (RQs) as defined under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) to state and local officials. Information about accidental chemical releases must be made available to the public.

3. Hazardous Chemical Storage Reporting (§§311 – 312) requires facilities that manufacture, process, or store designated hazardous chemicals to make Safety Data Sheets (SDSs, formerly referred to as material safety data sheets or MSDSs) describing the properties and health effects of these chemicals available to state and local officials and local fire

departments. These sections also require facilities to report to state and local officials and local fire departments, inventories of all onsite chemicals for which SDSs exist. Lastly, information about chemical inventories at facilities and SDSs must be available to the public.

4. Toxic Chemical Release Inventory (§313) requires facilities to annually complete and submit a Toxic Chemical Release Inventory Form for each Toxic Release Inventory (TRI) chemical that are manufactured or otherwise used above the applicable threshold quantities.

Implementation of EPCRA has been delegated to the State of California. The California Emergency Management Agency requires facilities to develop a Hazardous Materials Business Plan if they handle hazardous materials in quantities equal to or greater than 55 gallons, 500 pounds, or 200 cubic feet of gas or extremely hazardous substances above the threshold planning quantity. The Hazardous Materials Business Plan is provided to state and local emergency response agencies and includes inventories of hazardous materials, an emergency plan, and implements a training program for employees.

3.4.2.1.3 Hazardous Materials Transportation Act

The Hazardous Material Transportation Act (HMTA), adopted in 1975 (see 49 U.S.C. §§5101 – 5127), gave the Secretary of Transportation the regulatory and enforcement authority to provide adequate protection against the risks to life and property inherent in the transportation of hazardous materials in commerce. The U.S. DOT (see 49 CFR Parts 171-180) oversees the movement of hazardous materials at the federal level. The HMTA requires that carriers report accidental releases of hazardous materials to U.S. DOT at the earliest practical moment. Other incidents that must be reported include deaths, injuries requiring hospitalization, and property damage exceeding $50,000. The hazardous material regulations also contain emergency response provisions which include incident reporting requirements. Reports of major incidents go to the National Response Center, which in turn is linked with CHEMTREC, a public service hotline established by the chemical manufacturing industry for emergency responders to obtain information and assistance for emergency incidents involving chemicals and hazardous materials.

Hazardous materials regulations are implemented by the Research and Special Programs Administration (RSPA) branch of the U.S. DOT. The regulations cover the definition and classification of hazardous materials, communication of hazards to workers and the public, packaging and labeling requirements, operational rules for shippers, and training. These regulations apply to interstate, intrastate, and foreign commerce by air, rail, ships, and motor vehicles, and also cover hazardous waste shipments. The Federal Aviation Administration Office of Hazardous Materials Safety is responsible for overseeing the safe handling of hazardous materials aboard aircraft. The Federal Railroad Administration oversees the transportation of hazardous materials by rail. The U.S. Coast Guard regulates the bulk transport of hazardous materials by sea. The Federal Highway Administration (FHWA) is responsible for highway routing of hazardous materials and issuing highway safety permits.

3.4.2.1.4 Toxic Substances Control Act

The Toxic Substances Control Act (TSCA) was enacted by Congress in 1976 (see 15 U.S.C. §2601 et seq.) and gave the U.S. EPA the authority to protect the public from unreasonable risk of injury to health or the environment by regulating the manufacture, sale, and use of chemicals currently produced or imported into the United States. The TSCA, however, does not address wastes produced as byproducts of manufacturing. The types of chemicals regulated by the act fall into two categories: existing and new. New chemicals are defined as "any chemical substance which is not included in the chemical substance list compiled and published under [TSCA] section 8(b)." This list included all of chemical substances manufactured or imported into the U.S. prior to December 1979. Existing chemicals include any chemical currently listed under section 8 (b). The distinction between existing and new chemicals is necessary as the act regulates each category of chemicals in different ways. The U.S. EPA repeatedly screens both new and existing chemicals and can require reporting or testing of those that may pose an environmental or human-health hazard. The U.S. EPA can ban the manufacture and import of those chemicals that pose an unreasonable risk.

3.4.2.1.5 Hazardous Material Worker and Public Safety Requirements

Occupational Safety and Health Administration Regulations: The federal Occupational Safety and Health Administration (OSHA) is an agency of the United States Department of Labor that was created by Congress under the Occupational Safety and Health Act in 1970. OSHA is the agency responsible for assuring worker safety in the handling and use of chemicals in the workplace. Under the authority of the Occupational Safety and Health Act of 1970, OSHA has adopted numerous regulations pertaining to worker safety (see 29 CFR Part 1910). These regulations set standards for safe workplaces and work practices, including the reporting of accidents and occupational injuries. Some OSHA regulations contain standards relating to hazardous materials handling to protect workers who handle toxic, flammable, reactive, or explosive materials, including workplace conditions, employee protection requirements, first aid, and fire protection, as well as material handling and storage. For example, facilities which use, store, manufacture, handle, process, or move hazardous materials are required to conduct employee safety training, have available and know how to use safety equipment, prepare illness prevention programs, provide hazardous substance exposure warnings, prepare emergency response plans, and prepare a fire prevention plan.

Procedures and standards for safe handling, storage, operation, remediation, and emergency response activities involving hazardous materials and waste are promulgated in 29 CFR Part 1910, Subpart H. Some key subsections in 29 CFR Part 1910, Subpart H are §1910.106 -Flammable Liquids and §1910.120 - Hazardous Waste Operations and Emergency Response. In particular, the Hazardous Waste Operations and Emergency Response regulations contain requirements for worker training programs, medical surveillance for workers engaging in the handling of hazardous materials or wastes, and waste site emergency and remediation planning, for those who are engaged in specific clean-up, corrective action, hazardous material handling, and emergency response activities (see 29 CFR Part 1910 Subpart H, §1910.120 (a)(1)(i-v) and §1926.65 (a)(1)(i-v)).

Process Safety Management: As part of the numerous regulations pertaining to worker safety adopted by OSHA, specific requirements that pertain to Process Safety Management (PSM) of Highly Hazardous Chemicals were adopted in 29 CFR Part 1910 Subpart H, §1910.119 and 8 CCR §5189 to protect workers at facilities that have toxic, flammable, reactive or explosive materials. PSM program elements are aimed at preventing or minimizing the consequences of catastrophic releases of chemicals and include process hazard analyses, formal training programs for employees and contractors, investigation of equipment mechanical integrity, and an emergency response plan. Specifically, the PSM program requires facilities that use, store, manufacture, handle, process, or move hazardous materials to conduct employee safety training; have an inventory of safety equipment relevant to potential hazards; have knowledge on use of the safety equipment; prepare an illness prevention program; provide hazardous substance exposure warnings; prepare an emergency response plan; and prepare a fire prevention plan.

Emergency Action Plan: An Emergency Action Plan (EAP) is a written document required by OSHA standards promulgated in 29 CFR Part 1910, Subpart E, §1910.38 (a) to facilitate and organize a safe employer and employee response during workplace emergencies. An EAP is required by all that are required to have fire extinguishers. At a minimum, an EAP must include the following: 1) a means of reporting fires and other emergencies; 2) evacuation procedures and emergency escape route assignments; 3) procedures to be followed by employees who remain to operate critical plant operations before they evacuate; 4) procedures to account for all employees after an emergency evacuation has been completed; 5) rescue and medical duties for those employees who are to perform them; and, 6) names or job titles of persons who can be contacted for further information or explanation of duties under the plan.

National Fire Regulations: The National Fire Codes (NFC), Title 45, published by the National Fire Protection Association (NFPA) contains standards for laboratories using chemicals, which are not requirements, but are generally employed by organizations in order to protect workers. These standards provide basic protection of life and property in laboratory work areas through prevention and control of fires and explosions, and also serve to protect personnel from exposure to non-fire health hazards.

In addition to the NFC, the NFPA adopted a hazard rating system which is promulgated in NFPA 704 - Standard System for the Identification of the Hazards of Materials for Emergency Response. NFPA 704 is a "standard (that) provides a readily recognized, easily understood system for identifying specific hazards and their severity using spatial, visual, and numerical methods to describe in simple terms the relative hazards of a material. It addresses the health, flammability, instability, and related hazards that may be presented as short-term, acute exposures that are most likely to occur as a result of fire, spill, or similar emergency." In addition, the hazard ratings per NFPA 704 are used by emergency personnel to quickly and easily identify the risks posed by nearby hazardous materials in order to help determine what, if any, specialty equipment should be used, procedures followed, or precautions taken during the first moments of an emergency response. The scale is divided into four color-coded categories, with blue indicating level of health hazard, red indicating the flammability hazard, yellow indicating the chemical reactivity, and white containing special codes for unique hazards such as corrosivity and radioactivity. Each hazard category is rated on a scale from 0 (no hazard; normal substance) to 4 (extreme risk). Table 3.4-3 summarizes what the codes mean for each hazards category.

TABLE 3.4-3

NFPA 704 Hazards Rating Code

Hazard Rating Code	Health (Blue)	Flammability (Red)	Reactivity (Yellow)	Special (White)
4 = Extreme	Very short exposure could cause death or major residual injury (extreme hazard).	Will rapidly or completely vaporize at normal atmospheric pressure and temperature, or is readily dispersed in air and will burn readily. Flash point below 73°F.	Readily capable of detonation or explosive decomposition at normal temperatures and pressures.	W = Reacts with water in an unusual or dangerous manner.
3 = High	Short exposure could cause serious temporary or moderate residual injury.	Liquids and solids that can be ignited under almost all ambient temperature conditions. Flash point between 73°F and 100°F.	Capable of detonation or explosive decomposition but requires a strong initiating source, must be heated under confinement before initiation, reacts explosively with water, or will detonate if severely shocked.	**OXY** = Oxidizer
2 = Moderate	Intense or continued but not chronic exposure could cause temporary incapacitation or possible residual injury.	Must be moderately heated or exposed to relatively high ambient temperature before ignition can occur. Flash point between 100°F and 200°F.	Undergoes violent chemical change at elevated temperatures and pressures, reacts violently with water, or may form explosive mixtures with water.	**SA** = Simple asphyxiant gas (includes nitrogen, helium, neon, argon, krypton, and xenon).
1 = Slight	Exposure would cause irritation with only minor residual injury.	Must be heated before ignition can occur. Flash point over 200°F.	Normally stable, but can become unstable at elevated temperatures and pressures.	Not applicable
0 = Insignificant	Poses no health hazard, no precautions necessary.	Will not burn.	Normally stable, even under fire exposure conditions, and is not reactive with water.	Not applicable

In addition to the information in Table 3.4-3, a number of other physical or chemical properties may cause a substance to be a fire hazard. With respect to determining whether any substance is classified as a fire hazard, SDS lists the NFPA 704 flammability hazard ratings (e.g., NFPA 704).

Although substances can have the same NFPA 704 Flammability Ratings Code, other factors can make each substance's fire hazard very different from each other. For this reason, additional chemical characteristics, such as auto-ignition temperature, boiling point, evaporation rate, flash point, lower explosive limit (LEL), upper explosive limit (UEL), and vapor pressure, are also considered when determining whether a substance is fire hazard. The following is a brief description of each of these chemical characteristics.

Auto-ignition Temperature: The auto-ignition temperature of a substance is the lowest temperature at which it will spontaneously ignite in a normal atmosphere without an external source of ignition, such as a flame or spark.

Boiling Point: The boiling point of a substance is the temperature at which the vapor pressure of the liquid equals the environmental pressure surrounding the liquid. Boiling is a process in which molecules anywhere in the liquid escape, resulting in the formation of vapor bubbles within the liquid.

Evaporation Rate: Evaporation rate is the rate at which a material will vaporize (evaporate, change from liquid to a vapor) compared to the rate of vaporization of a specific known material. This quantity is a represented as a unit less ratio. For example, a substance with a high evaporation rate will readily form a vapor which can be inhaled or explode, and thus have a higher hazard risk. Evaporation rates generally have an inverse relationship to boiling points (i.e., the higher the boiling point, the lower the rate of evaporation).

Flash Point: Flash point is the lowest temperature at which a volatile liquid can vaporize to form an ignitable mixture in air. Measuring a liquid's flash point requires an ignition source. At the flash point, the vapor may cease to burn when the source of ignition is removed. There are different methods that can be used to determine the flashpoint of a solvent but the most frequently used method is the Tagliabue Closed Cup standard (ASTM D56), also known as the TCC. The flashpoint is determined by a TCC laboratory device which is used to determine the flash point of mobile petroleum liquids with flash point temperatures below 175 degrees Fahrenheit (79.4 degrees Centigrade).

Flash point is a particularly important measure of the fire hazard of a substance. For example, the Consumer Products Safety Commission (CPSC) promulgated Labeling and Banning Requirements for Chemicals and Other Hazardous Substances in 15 U.S.C. §1261 and 16 CFR Part 1500. Per the CPSC, the flammability of a product is defined in 16 CFR Part 1500.3 (c)(6) and is based on flash point. For example, a liquid needs to be labeled as: 1) “Extremely Flammable” if the flash point is below 20 degrees Fahrenheit; 2) “Flammable” if the flash point is above 20 degrees Fahrenheit but less than 100 degrees Fahrenheit; or, 3) “Combustible” if the flash point is above 100 degrees Fahrenheit up to and including 150 degrees Fahrenheit.

Lower Explosive Limit (LEL): The lower explosive limit of a gas or a vapor is the limiting concentration (in air) that is needed for the gas to ignite and explode or the lowest concentration (percentage) of a gas or a vapor in air capable of producing a flash of fire in presence of an ignition source (e.g., arc, flame, or heat). If the concentration of a substance in air is below the LEL, there is not enough fuel to continue an explosion. In other words, concentrations lower than the LEL are "too lean" to burn. For example, methane gas has a LEL of 4.4 percent (at 138 degrees Centigrade) by volume, meaning 4.4 percent of the total volume of the air consists of methane. At 20 degrees Centigrade, the LEL for methane is 5.1 percent by volume. If the atmosphere has less that 5.1 percent methane, an explosion cannot occur even if a source of ignition is present. When the concentration of methane reaches 5.1 percent, an explosion can occur if there is an ignition source.

Upper Explosive Limit (UEL): The upper explosive limit of a gas or a vapor is the highest concentration (percentage) of a gas or a vapor in air capable of producing a flash of fire in presence of an ignition source (e.g., arc, flame, or heat). Concentrations of a substance in air above the UEL are "too rich" to burn.

Vapor Pressure: Vapor pressure is an indicator of a chemical's tendency to evaporate into gaseous form.

Health Hazards Guidance: In addition to fire impacts, health hazards can also be generated due to exposure of chemicals present in both conventional as well as reformulated products. Using available toxicological information to evaluate potential human health impacts associated with conventional solvents and potential replacement solvents, the toxicity of the conventional solvents can be compared to solvents expected to be used in reformulated products. As a measure of a chemical's potential health hazards, the following values need to be considered: the Threshold Limit Values established by the American Conference of Governmental Industrial Hygiene, OSHA's Permissible Exposure Limits, the Immediately Dangerous to Life and Health levels recommended by the National Institute for Occupational Safety and Health (NIOSH), and health hazards developed by the National Safety Council. The following is a brief description of each of these values.

Threshold Limit Values (TLVs): The TLV of a chemical substance is a level to which it is believed a worker can be exposed day after day for a working lifetime without adverse health effects. The TLV is an estimate based on the known toxicity in humans or animals of a given chemical substance, and the reliability and accuracy of the latest sampling and analytical methods. The TLV for chemical substances is defined as a concentration in air, typically for inhalation or skin exposure. Its units are in parts per million (ppm) for gases and in milligrams per cubic meter (mg/m^3) for particulates. The TLV is a recommended guideline by ACGIH.

Permissible Exposure Limits (PEL): The PEL is a legal limit, usually expressed in ppm, established by OSHA to protect workers against the health effects of exposure to hazardous substances. PELs are regulatory limits on the amount or concentration of a substance in the air. A PEL is usually given as a time-weighted average (TWA), although some are short-term exposure limits (STEL) or ceiling limits. A TWA is the average exposure over a specified period of time, usually eight hours. This means that, for limited periods, a worker may be exposed to concentrations higher than the PEL, so long as the average concentration over eight hours remains lower. A short-term exposure limit is one that addresses the average exposure over a 15 to 30 minute period of maximum exposure during a single work shift. A ceiling limit is one that may not be exceeded for any period of time, and is applied to irritants and other materials that have immediate effects. The OSHA PELs are published in 29 CFR 1910.1000, Table Z1.

Immediately Dangerous to Life and Health (IDLH): IDLH is an acronym defined by NIOSH as exposure to airborne contaminants that is "likely to cause death or immediate or delayed permanent adverse health effects or prevent escape from such an environment." IDLH values are often used to guide the selection of breathing apparatus that are made available to workers or firefighters in specific situations.

3.4.2.1.6 Oil and Pipeline Regulations and Oversight

Oil Pollution Act: The Oil Pollution Act was signed into law in 1990 to give the federal government authority to better respond to oil spills. The Oil Pollution Act improved the federal government's ability to prevent and respond to oil spills, including provision of money and resources. The Oil Pollution Act establishes polluter liability, gives states enforcement rights in navigable waters of the state, mandates the development of spill control and response plans for all vessels and facilities, increases fines and enforcement mechanisms, and establishes a federal trust fund for financing clean-up.

The Oil Pollution Act also establishes the National Oil Spill Liability Trust Fund to provide financing for cases in which the responsible party is either not readily identifiable, or refuses to pay the cleanup/damage costs. In addition, the Oil Pollution Act expands provisions of the National Oil and Hazardous Substances Pollution Contingency Plan, more commonly called the National Contingency Plan, requiring the federal government to direct all public and private oil spill response efforts. It also requires area committees, composed of federal, state, and local government officials, to develop detailed, location-specific area contingency plans. In addition, the Oil Pollution Act directs owners and operators of vessels, and certain facilities that pose a serious threat to the environment, to prepare their own specific facility response plans. The Oil Pollution Act increases penalties for regulatory non-compliance by responsible parties; gives the federal government broad enforcement authority; and provides individual states the authority to establish their own laws governing oil spills, prevention measures, and response methods.

Oil Pollution Prevention Regulation: In 1973, the USEPA issued the Oil Pollution Prevention regulation (see 40 CFR 112)**,** to address the oil spill prevention provisions contained in the Clean Water Act of 1972. The Spill Prevention, Control, and Countermeasure (SPCC) Rule is part of the Oil Pollution Prevention regulations (see 40 CFR Part 112, Subparts A - C). Specifically, the SPCC rule includes requirements for oil spill prevention, preparedness, and response to prevent oil discharges to navigable waters and adjoining shorelines. The rule requires specific facilities to prepare, amend, and implement SPCC Plans. SPCC Plans require applicable facilities to take steps to prevent oil spills including: 1) using suitable storage containers/tanks; 2) providing overfill prevention (e.g., high-level alarms); 3) providing secondary containment for bulk storage tanks; 4) providing secondary containment to catch oil spills during transfer activities; and, 5) periodically inspecting and testing pipes and containers.

U.S. Department of Transportation, Office of Pipeline Safety: The Office of Pipeline Safety, within the U.S. DOT, Pipeline and Hazards Material Safety Administration, has jurisdictional responsibility for developing regulations and standards to ensure the safe and secure movement of hazardous liquid and gas pipelines under its jurisdiction in the United States. The Office of Pipeline Safety has the following key responsibilities:

- Support the operation of, and coordinate with the United States Coast Guard on the National Response Center and serve as a liaison with the Department of Homeland Security and the Federal Emergency Management Agency on matters involving pipeline safety;
- Develop and maintain partnerships with other federal, state, and local agencies, public interest groups, tribal governments, and the regulated industry and other underground utilities to address threats to pipeline integrity, service, and reliability and to share responsibility for the safety of communities;
- Administer pipeline safety regulatory programs and develops regulatory policy involving pipeline safety;
- Oversee pipeline operator implementation of risk management and risk-based programs and administer a national pipeline inspection and enforcement program;
- Provide technical and resource assistance for state pipeline safety programs to ensure oversight of intrastate pipeline systems and educational programs at the local level; and,
- Support the development and conduct of pipeline safety training programs for federal and state regulatory and compliance staff and the pipeline industry.

49 CFR Parts 178 – 185 relates to the role of transportation, including pipelines, in the United States. 49 CFR Parts 186-199 establishes minimum pipeline safety standards. The Office of the State Fire Marshal works in partnership with the Federal Pipeline and Hazardous Materials Safety Administration to assure pipeline operators are meeting requirements for safe, reliable, and environmentally sound operation of their facilities for intrastate pipelines within California.

Chemical Facility Anti-Terrorism Standards: The Federal Department of Homeland Security established the chemical facility anti-terrorism standards in 2007 (see 6 CFR Part 27). These regulations established risk-based performance standards for the security of chemical facilities and require covered chemical facilities to prepare Security Vulnerability Assessments, which identify facility security vulnerabilities, and to develop and implement security plans.

3.4.2.2 State Regulations

California Hazardous Waste Control Law: The California Hazardous Waste Control Law is administered by the California Environmental Protection Agency (CalEPA) to regulate hazardous wastes within the State of California. While the California Hazardous Waste Control Law is generally more stringent than RCRA, both the state and federal laws apply in California. The California Department of Toxic Substances Control (DTSC) is the primary agency in charge of enforcing both the federal and state hazardous materials laws in California. The DTSC regulates hazardous waste, oversees the cleanup of existing contamination, and pursues methods to reduce hazardous waste produced in California. The DTSC regulates hazardous waste in California under the authority of RCRA, the California Hazardous Waste Control Law, and the California Health and Safety Code. Under the direction of the CalEPA, the DTSC maintains the Cortese List and Envirostor databases of hazardous materials and waste sites as specified under Government Code §65962.5.

The Hazardous Waste Control Law (22 CCR Chapter 11, Appendix X) also lists 791 chemicals and approximately 300 common materials which may be hazardous; establishes criteria for identifying, packaging, and labeling hazardous wastes; prescribes management controls; establishes permit requirements for treatment, storage, disposal, and transportation; and identifies some wastes that cannot be disposed of in landfills.

California Occupational Safety and Health Administration: The California Occupational Safety and Health Administration (CalOSHA) is the primary agency responsible for worker safety in the handling and use of chemicals in the workplace. CalOSHA requires the employer to monitor worker exposure to listed hazardous substances and notify workers of exposure (8 CCR Sections 337-340). The regulations specify requirements for employee training, availability of safety equipment, accident-prevention programs, and hazardous substance exposure warnings. CalOSHA standards are generally more stringent than federal regulations.

Hazardous Materials Release Notification: Many state statutes require emergency notification of a hazardous chemical release, including:

- California Health and Safety Code §25270.7, §25270.8, and §25507;
- California Vehicle Code §23112.5;
- California Public Utilities Code §7673 (General Orders #22-B, 161);
- California Government Code §51018 and §8670.25.5(a);
- California Water Code §13271 and §13272; and,
- California Labor Code §6409.1(b)10.

California Accident Release Prevention (CalARP) Program: The California Accident Release Prevention Program (19 CCR Division 2, Chapter 4.5) requires the preparation of RMPs. CalARP requires stationary sources with more than a threshold quantity of a regulated substance to be evaluated to determine the potential for and impacts of accidental releases from any processes onsite (not transport) subject to state risk management requirements. RMPs are documents prepared by the owner or operator of a stationary source containing detailed information including: (1) regulated substances held onsite at the stationary source; (2) offsite consequences of an accidental release of a regulated substance; (3) the accident history at the stationary source; (4) the emergency response program for the stationary source; (5) coordination with local emergency responders; (6) hazard review or process hazard analysis; (7) operating procedures at the stationary source; (8) training of the stationary source's personnel; (9) maintenance and mechanical integrity of the stationary source's physical plant; and (10) incident investigation. The CalARP program is implemented at the local government level by Certified Unified Program Agencies (CUPAs) also known as Administering Agencies (AAs). Typically, local fire departments are the administering agencies of the CalARP program because they frequently are the first responders in the event of a release. California is proposing modifications to the CalARP Program along with the state's PSM program in response to an accident at the Chevron Richmond Refinery. The proposed regulations were released for public comment on July 15, 2016 and the public comment period closes on September 15, 2016. After the close of the comment period a modified version of the proposed regulations was released in February 2017 and the public comment period for comments on the modifications closed on March 3, 2017.

Hazardous Materials Disclosure Program: The Unified Hazardous Waste and Hazardous Materials Management Regulatory Program (Unified Program) as promulgated by CalEPA in CCR, Title 27, Chapter 6.11 requires the administrative consolidation of six hazardous materials and waste programs (program elements) under one agency, a CUPA. The Unified Program administered by the State of California consolidates, coordinates, and makes consistent the administrative requirements, permits, inspections, and enforcement activities for the state's environmental and emergency management programs, which include Hazardous Waste Generator and Onsite Hazardous Waste Treatment Programs ("Tiered Permitting"); Above ground SPCC Program; Hazardous Materials Release Response Plans and Inventories (business plans); the CalARP Program; the UST Program; and the Uniform Fire Code Plans and Inventory Requirements. The Unified Program is implemented at the local government level by CUPAs.

Hazardous Materials Management Act: The State of California (California Health and Safety Code Division 20, Chapter 6.95) requires any business that handles more than a specified amount of hazardous or extremely hazardous materials, termed a "reportable quantity," to submit a Hazardous Materials Business Plan to its Certified Unified Program Agency. Business plans must include an inventory of the types, quantities, and locations of hazardous materials at the facility. Businesses are required to update their business plans at least once every three years and the chemical portion of their plans every year. Also, business plans must include emergency response plans and procedures to be used in the event of a significant or threatened significant release of a hazardous material. These plans need to identify the procedures to follow for immediate notification to all appropriate agencies and personnel of a release, identification of local emergency medical assistance appropriate for potential accident scenarios, contact information for all company emergency coordinators, a listing and location of emergency equipment at the business, an evacuation plan, and a training program for business personnel. The requirements for hazardous materials business plans are specified in the California Health and Safety Code and 19 CCR.

Hazardous Materials Transportation in California: California regulates the transportation of hazardous waste originating or passing through the State in Title 13, CCR. The California Highway Patrol (CHP) and Caltrans have primary responsibility for enforcing federal and state regulations and responding to hazardous materials transportation emergencies. The CHP enforces materials and hazardous waste labeling and packing regulations that prevent leakage and spills of material in transit and provide detailed information to cleanup crews in the event of an incident. Vehicle and equipment inspection, shipment preparation, container identification, and shipping documentation are all part of the responsibility of the CHP. Caltrans has emergency chemical spill identification teams at locations throughout the State.

California Fire Code: While NFC Standard 45 and NFPA 704 are regarded as nationally recognized standards, the California Fire Code (24 CCR) also contains state standards for the use and storage of hazardous materials and special standards for buildings where hazardous materials are found. Some of these regulations consist of amendments to NFC Standard 45. State Fire Code regulations require emergency pre-fire plans to include training programs in first aid, the use of fire equipment, and methods of evacuation.

3.4.2.3 Local Regulations

Most counties in California have prepared Hazardous Waste Management Plans (HWMPs) that outlines how hazardous waste generated in the county is managed. The HWMP identifies the types and amounts of wastes generated; establishes programs for managing these wastes; identifies an application review process for the siting of specified hazardous waste facilities; identifies mechanisms for reducing the amount of waste generated; and identifies goals, policies, and actions for achieving effective hazardous waste management

Contra Costa County has adopted an industrial safety ordinance that addresses the human factors that lead to accidents. The ordinance requires stationary sources to develop a written human factors program that considers human factors as part of process hazards analyses, incident investigations, training, operating procedures, among others.

3.4.3 SIGNIFICANCE THRESHOLDS

The impacts associated with hazards will be considered significant if any of the following occur:

- Non-compliance with any applicable design code or regulation.
- Non-conformance to National Fire Protection Association standards.
- Non-conformance to regulations or generally accepted industry practices related to operating policy and procedures concerning the design, construction, security, leak detection, spill containment or fire protection.
- Exposure to hazardous chemicals in concentrations equal to or greater than the Emergency Response Planning Guideline (ERPG) 2 levels.

3.4.4 ENVIRONMENTAL IMPACTS

Proposed Rule 11-18: The proposed rule is designed to reduce health risk associated with emissions of TACs from existing stationary sources in the Bay Area. The proposed rule is not expected to require substantial new development. Any new air pollution control equipment or enclosures would be expected to occur within existing commercial or industrial facilities. Facility modifications associated with the proposed rule are largely expected to include limiting throughput or hours of operations; increased use of diesel particulate filters; additional enclosures and bag houses, and thermal oxidizers or carbon adsorption systems. The hazards associated with the use of these types of air pollution control equipment and systems are minimal. Table 3.4-1 summarizes the expected air pollution control equipment and the impacts of those with potential hazard impacts are discussed further in the subsections below.

Proposed Rule 12-16: For any refineries that are shown to exceed the refinery-wide emissions limits for SO_2 and $PM_{2.5}$ emissions or the cancer or non-cancer significant risk levels, it is expected that refinery operators would install new or modify their existing air pollution control equipment in order to reduce the applicable emissions to comply with Rule 12-16 requirements. Because refineries handle a number of hazardous materials, potential hazards and hazardous materials impacts already exist; are generally common to most oil processing facilities worldwide; and are a function of the materials being processed, processing systems, procedures used for operating and maintaining the facility, and hazard detection, and mitigation systems. The major types of public safety risks at a refinery consist of risks from accidental releases of regulated substances and from major fires and explosions.

Installation of new or modifications to existing air pollution control technologies may generate new hazards at the affected refineries from the use, storage and transport of potentially hazardous materials during operation-related activities. Some of the key effects of implementing Rule 12-16 and the determination of which types of air pollution control equipment involve hazards and hazardous materials focus on: 1) the anticipated increase of potentially hazardous substances used to operate the new air pollution control equipment and the anticipated replacement and/or supplement of substances used to modify or upgrade existing air pollution control systems; and, 2) the increased capture of hazardous substances as part of the overall emission reduction effort. Some control technologies are inherently dangerous or may use hazardous materials, which could contribute to significant adverse hazard or hazardous materials impacts.

Table 3.4-1 shows air pollution control technologies that would provide the best opportunities for obtaining further reductions in SO_2, PM2.5, and TAC emissions. Table 3.4-1 also identifies the types of hazards or hazardous materials impacts that may be generated by the control technologies under evaluation. Those air pollution control technologies shown in Table 3.4-1 where no hazards or hazardous materials impacts were identified will not be evaluated further. Air pollution control technologies that have the potential to generate hazard or hazardous materials impacts are analyzed further in the subsections below.

TABLE 3.4-1

Potential Hazards Impacts from Installing Air Pollution Control Equipment under Rules 11-18 or 12-16.

Applicable Rule	Potential Control Technology	Hazard Impacts	Analyzed Further?	Significant?
11-18 &12-16	Baghouse with HEPA Filters	Potential for fire explosion	Yes	No[1]
11-18	Carbon Adsorption	None Identified	No	No
12-16	Compressor	None identified	No	No
12-16	Cyclone	None identified	No	No
11-18 & 12-16	Diesel Oxidation Catalyst	None identified	No	No
11-18 & 12-16	Diesel Particulate Filter	None identified	No	No
12-16	Electrostatic Precipitator (Wet and Dry)	Potential for explosion	Yes	No[1]
12-16	Fuel Gas Treatment (Additive to Existing Amine System)	Potential hazards associated with increased use of amines	Yes	No
12-16	Fuel Gas Treatment (Merox)	Potential hazards associated with increased use of Merox	Yes	No
12-16	LoTOx™	Potential hazards associated with increased use of caustic or lime.	No	No
11-18 & 12-16	Replace old Diesel ICEs with New Diesel ICEs	None identified	No	No
12-16	Selective Catalytic Reduction	Potential hazards associated with increased use of ammonia	Yes	No
12-16	Selective Oxidation Catalyst	Potential hazards associated with catalyst	No	No
11-18	Steam Ejector Technology	None identified	No	No
12-16	SOx Reducing Additive	None identified	No	No
11-18	Thermal Oxidizer	None identified	No	No
12-16	Ultracat	Potential hazards associated with increased use of ammonia	Yes	No
11-18 & 12-16	Wet Gas Scrubber	Potential hazards associated with increased use of ammonia	Yes	No

[1] Implementing mitigation measures in Section 3.4.5 reduces impacts to less than significant.

3.4.4.1 Baghouse – Rules 11-18 and 12-16

Dusts have a very large surface area compared to their mass. Since burning can only occur at the surface of a solid or liquid, where it can react with oxygen, this causes dusts to be much more flammable than bulk materials. Explosions are another operating hazard. For an explosion to occur, the concentration of dust in the baghouse housing or duct must be between the lower and upper explosive concentrations and a spark must be present. In mechanical cleaning (shaker) collectors, the flow is stopped in the filter compartment and the filter elements are agitated all at the same time. A potential for an explosion occurs since the concentration will likely pass through the explosive limits during this action.

Although the type of facilities where these accidents occurred were not identified, at least 281 combustible dust fires and explosions from baghouses occurred in general industries between 1980 and 2005 in the United States, which caused at least 119 fatalities and 718 injuries (Dalsanto, 2011). However, based on the chemical and physical characteristics of the dusts involved, e.g., organic, sulfur, coke, etc., it is assumed that at least some of these accidents occurred at industrial facilities. Therefore, in light of the fact that there is a potential for explosion or fire hazards, to be conservative it is concluded here that baghouses may cause or contribute to significant adverse hazard and hazardous materials impacts for both Rule 11-18 and Rule 12-16. Therefore, mitigation measures have been identified in Section 3.4.5.

3.4.4.2 Electrostatic Precipitator – Rule 12-16

Electrostatic precipitators have several advantages compared with other air pollution control devices, in part, because they are very efficient collectors, even for small particles. Further, because the collection forces act only on the particles, ESPs can treat large volumes of gas with low pressure drops. They can collect dry materials, fumes, or mists. Electrostatic precipitators can also operate over a wide range of temperatures and generally have low operating costs. There are two broad types of ESPs, dry and wet.

3.4.4.2.1 Dry ESPs

Dry ESPs remove dust from the collection electrodes by vibrating the electrodes through the use of rappers. Wire-plate dry ESPs are by far the most common design of an ESP and are used in a number of industries, including petroleum refining. Dry ESPs remove dust from the collection electrodes by vibrating the electrodes through the use of rappers. Common types of rappers are gravity impact hammers and electric vibrators. For a given ESP, the rapping intensity and frequency must be adjusted to optimize performance. Sonic energy is also used to assist dust removal in some dry ESPs. The main components of dry ESPs are an outside shell to house the unit, high voltage discharge electrodes, grounded collection electrodes, a high voltage source, a rapping system, and hoppers.

Hazards associated with dry ESPs include fire and explosion hazards that can occur at the inlet to ESPs when highly charged dust particles are transported by a gas carrier that can contain the mixtures of both incombustible and combustible flue gases. The risk of ignition and even explosion is especially high in the presence of an explosive mixture of oxygen, hydrocarbons, carbon monoxide, etc. The ignition source is typically caused by the breakdown between the corona electrode and the collecting electrode, but in some cases electrostatic discharge (typically back corona) can also act as an ignition source.

Other problems that may contribute to fire or explosion hazards include the following. Minimum clearance between electrodes may result in repeated "sparkover" causing local heating and vaporization of wires causing the wires to break. Broken wires may swing freely and cause shorting between discharge and collector electrodes. Excessive rapping may also break wires. Poor electrical alignment may cause the wire frame to oscillate fatiguing wires and increasing sparking. If high levels of carbon are known to exist on the collecting surface or in the hoppers, opening the precipitator access doors may result in spontaneous combustion of the hot dust caused by the inrush of air.

Electrostatic Precipitators or ESPs have been used in industry for over 60 years. Review of the safety record of dry ESPs over the last 20 years did not identify any explosion or fire hazards. However, in light of the fact that there is a potential for explosion or fire hazards, to be conservative it is concluded here that dry ESPs may cause or contribute to significant adverse hazard and hazardous materials impacts. Therefore, mitigation measures have been identified in Section 3.4.4.

3.4.4.2.2 Wet ESPs

The basic components of a wet ESP are the same as those of a dry ESP with the exception that a wet ESP requires a water spray system rather than a system of rappers. The gas stream is either saturated before entering the collection area or the collecting surface is continually wetted to prevent agglomerations from forming. Because the dust is removed from a wet ESP in the form of a slurry, hoppers are typically replaced with a drainage system. Wet ESPs have the following advantages over dry ESPs. Wet ESPs can adsorb gases, cause some pollutants to condense, are easily integrated with scrubbers, and eliminate re-entrainment of captured particles.

Particulates collected from wet ESPs are washed from the collection electrodes with water or another suitable liquid. Some wet ESP applications require that liquid is sprayed continuously into the gas stream; in other cases, the liquid may be sprayed intermittently. Since the liquid spray saturates the gas stream in a wet ESP, it also provides gas cooling and conditioning. Because particulates are removed from a wet ESP as a slurry, explosion hazards are unlikely (Dorman, 1974). Therefore, hazards and hazardous materials impacts from wet ESPs are concluded to be less than significant. Therefore, mitigation measures are not required.

3.4.4.3 Flue Gas Treatment – Rule 12-16

Amine absorbers are typically used for reducing SOx emissions as part of FGT or as part of SRU/TGU systems operated at refineries. The type of amine used in these absorbers varies from process to process and sometimes the amines are paired up with a proprietary catalyst such as Merox for additional SOx control. The most common amines are DEA, MDEA, and MEA and their use is limited to removing H_2S and CO_2 from gas streams. While none of these amines can remove mercaptans, DEA and MEA can be used to remove carbonyl sulfide.

3.4.4.3.1 Amines

DEA: Of the following three amines, DEA, MDEA, and MEA, DEA is the only amine that is a TAC and carcinogenic. MDEA and MEA are not regulated substances pursuant to BAAQMD's Regulation 2-5. DEA is regulated as a hazardous compound substance pursuant to BAAQMD's Regulation 2-5. Located on the MSDS for DEA, the NFPA hazards ratings are follows: health is rated 1 (slightly hazardous), flammability is rated 1 (slightly flammable) and reactivity is rated 0 (none). Located on the MSDSs for MEA, the NFPA hazards ratings are follows: health is rated 3 (highly hazardous), flammability is rated 2 (moderately flammable) and reactivity is rated 0 (none). The NFPA has not assigned a rating for MDEA.

As previously noted, it is assumed that any affected refinery operator who installs a WGS pursuant to future Regulation 12-16 requirements, would likely use the same amines that are currently used for other refinery units or processes. In this situation, there would likely be increased throughput of the amine through the storage tank, but in the event of an accidental release, the hazard consequence would not change. Consequently, installation of a WGS using DEA, MDEA, or DEA in the amine absorber would not cause or contribute to exceedances of any applicable hazards and hazardous materials significance thresholds. Therefore, potential hazards and hazardous materials impacts from increased usage of DEA, MDEA, or DEA would be less than significant and mitigation measures are not required.

3.4.4.3.2 Merox Treatment

Merox is a proprietary caustic scrubbing technology used for removing mercaptans and residual H_2S from fuel gas. A Merox unit will typically consist of a column with three sections: 1) pre-wash; 2) extraction; and, 3) water wash. Feedstock enters the bottom of the column in the prewash section. The gas flows upward in the column where NaOH caustic is injected into the extraction section; the caustic acts as an absorbing agent to capture the mercaptans and convert them to sodium mercaptides. The spent caustic solution is regenerated by an oxidizer unit with catalyst injection to convert the mercaptides to disulfide oil. The disulfide oil is separated and then is typically sent elsewhere within the refinery for further processing while the regenerated caustic soda is returned to the extraction section of the column.

If a Merox system is added to an existing absorber system, it is likely that the current amine solution would continue to be used. The addition or conversion to Merox technology will increase the amount of NaOH needed at any affected refineries. The analysis for the potential increases in NaOH for a WGS system is further addressed in Subsection 3.4.4.7.1 below. Based on available information, Merox catalyst that would be needed is approximately eight pounds per day or 3,000 pounds per year for the caustic regeneration portion of the Merox process for a typical absorber system.

Merox catalyst is comprised of a proprietary, cobalt-based reagent (a trade secret cobalt phthalocyanine sulfonate compound) that contains mostly water. The MSDS for Merox catalyst indicates that none of the ingredients in the catalyst has components that are classified or regulated by OSHA or by the United States National Toxicology Program (NTP). However, all of the ingredients in the catalyst are registered on the Toxic Substances Control Act (TSCA) Chemical Substance Inventory. Cobalt compounds are also specified as toxic chemicals under SARA Section 313 and may be subject to the Toxic Release Inventory (TRI) reporting requirements under 40 CFR 372. In addition, cobalt compounds are regulated pursuant to the State of California's Proposition 65 noticing requirements. Cobalt and cobalt compounds are not regulated by BAAQMD Regulation 2-5 or CalARP. The NFPA has not assigned a rating for Merox catalyst. Finally, Merox catalyst is not listed in the U.S. EPA's RCRA regulations because it does not possess any of the four identifying characteristics of hazardous waste (e.g., ignitibility, corrosivity, reactivity or toxicity).

Implementing FGT modifications at affected refineries by installing Merox treatment systems is not expected to change the hazards profile of the affected units because Merox is not regulated as a hazardous substance. Thus, based on the preceding analysis, the hazards and hazardous materials impacts relative to the use of Merox are expected to be less than significant. Therefore, mitigation measures are not required.

3.4.4.4 Selective Catalytic Reduction – Rule 12-16

Ammonia or urea is used to react with NOx, in the presence of a catalyst, to form nitrogen gas and water. In some SCR installations, anhydrous ammonia is used. Although ammonia is currently used in SCRs throughout the Bay Area, safety hazards related to the transport, storage, and handling of ammonia exist. Ammonia has acute and chronic non-cancer health effects and also contributes to ambient PM10 emissions under some circumstances.

Onsite Release Scenario: The use of anhydrous ammonia involves greater risk than aqueous ammonia because it is stored and transported under pressure. In the event of a leak or rupture of a tank, anhydrous ammonia is released and vaporizes into the gaseous form, which is its normal state at atmospheric pressure and produces a toxic cloud. Aqueous ammonia is a liquid at ambient temperatures and gas is only produced when a liquid pool from a spill evaporates. Under current OES regulations implementing the CalARP requirements, both anhydrous and aqueous ammonia are regulated under California Health and Safety Code Section 2770.1.

Refineries and associated facilities may choose to use SCR to comply with Rule 12-16, which will cause the increased use and storage of ammonia. All of the stationary sources are located within industrial and commercial facilities, and are expected to be located in industrial/commercial zones. However, the use and storage of anhydrous ammonia would be expected to result in significant hazard impacts as there is the potential for anhydrous ammonia to migrate off-site and expose individuals to concentrations of ammonia that could lead to adverse health impacts. Anhydrous ammonia would be expected to form a vapor cloud (since anhydrous ammonia is a gas at standard temperature and pressure) and migrate from the point of release. The number of people exposed and the distance that the cloud would travel would depend on the meteorological conditions present. Depending on the location of the spill, a number of individuals could be exposed to concentrations of ammonia that would exceed the ERPG2 concentrations.

In the event of an aqueous ammonia release, the ammonia solution would have to pool and spread out over a flat surface in order to create sufficient evaporation to produce a significant vapor cloud. For a release from onsite vessels or storage tanks, spills would be released into a containment area, which would limit the surface area of the spill and the subsequent toxic emissions. The containment area would limit the potential pool size, minimizing the amount of spilled material that would evaporate, form a vapor cloud, and impact residences or other sensitive receptors in the area of the spill. Significant hazard impacts associated with a release of aqueous ammonia would not be expected. Therefore, the use of aqueous ammonia is expected to be preferred over anhydrous ammonia.

Transportation Release Scenario: Use and transport of anhydrous ammonia involves greater risk than aqueous ammonia because it is stored and transported under pressure. In the event of a leak or rupture of a tank, anhydrous ammonia is released and vaporizes into the gaseous form, which is its normal state at atmospheric temperature and pressure, and produces a toxic cloud. Aqueous ammonia is a liquid at ambient temperatures and pressure, and gas is only produced when a liquid pool from a spill evaporates. Deliveries of ammonia would be made to each facility by tanker truck via public roads. The maximum capacity of a tanker truck is 150 barrels. Regulations for the transport of hazardous materials by public highway are described in 49 Code of Federal Regulations (CFR) 173 and 177. Nineteen percent aqueous ammonia is considered a hazardous material under 49 CFR 172.

Although trucking of ammonia and other hazardous materials is regulated for safety by the U.S. Department of Transportation, there is a possibility that a tanker truck could be involved in an accident spilling its contents. The factors that enter into accident statistics include distance traveled and type of vehicle or transportation system. Factors affecting automobiles and truck transportation accidents include the type of roadway, presence of road hazards, vehicle type, maintenance and physical condition, and driver training. A common reference frequently used in measuring risk of an accident is the number of accidents per million miles traveled. Complicating the assessment of risk is the fact that some accidents can cause significant damage without injury or fatality.

The actual occurrence of an accidental release of a hazardous material cannot be predicted. The location of an accident or whether sensitive populations would be present in the immediate vicinity also cannot be identified. In general, the shortest and most direct route that takes the least amount of time would have the least risk of an accident. Hazardous material transporters do not routinely avoid populated areas along their routes, although they generally use approved truck routes that take population densities and sensitive populations into account.

The hazards associated with the transport of regulated (CCR Title 19, Division 2, Chapter 4.5 or the CalARP requirements) hazardous materials, including ammonia, would include the potential exposure of numerous individuals in the event of an accident that would lead to a spill. Factors such as amount transported, wind speed, ambient temperatures, route traveled, and distance to sensitive receptors are considered when determining the consequence of a hazardous material spill.

In the unlikely event that the tanker truck would rupture and release the entire 150 barrels of aqueous ammonia, the ammonia solution would have to pool and spread out over a flat surface in order to create sufficient evaporation to produce a significant vapor cloud. For a road accident, the roads are usually graded and channeled to prevent water accumulation and a spill would be channeled to a low spot or drainage system, which would limit the surface area of the spill and the subsequent toxic emissions. Additionally, the roadside surfaces may not be paved and may absorb some of the spill. Without this pooling effect on an impervious surface, the spilled ammonia would not evaporate into a toxic cloud and impact residences or other sensitive receptors in the area of the spill. An accidental aqueous ammonia spill occurring during transport is, therefore, not expected to have significant impacts.

3.4.4.5 Ultracat – Rule 12-16

Ultracat catalyst filters work similarly to SCR systems, using aqueous ammonia to react with NOx and resulting in nitrogen gas and water. As a result, the primary concern with Ultracat catalyst filters are the impacts associated with the transport, storage, and use of aqueous ammonia. The potential impacts of aqueous ammonia are previously discussed in detail in section 3.4.4 and were found not potentially significant. Thus, the same conclusion is drawn here. Ultracat catalyst filters are not expected to pose significant impacts and mitigation measures not required.

3.4.4.6 Wet Gas Scrubber – Rules 11-18 and 12-16

3.4.4.6.1 Caustic

For any operators at potentially affected facilities who choose to install a WGS, hazardous materials may be needed to operate the WGSs depending on the source category. Caustic is a key ingredient needed for the operation of a WGS; it is the most widely used substance for several SOx control applications spanning multiple equipment/source categories. While there are several types of caustic solutions that can be used in WGS operations, caustic made from sodium hydroxide (NaOH) is most commonly used for WGSs for FCCUs and coke calciners.

NAOH: NaOH, used as caustic in a WGS, is a toxic air contaminant; it is also a noncancerous but acutely hazardous substance. Located on the MSDS for NaOH (50 percent by weight), the hazards ratings are as follows: health is rated 3 (highly hazardous, flammability is rated 0 (none), and reactivity is rated 1 (slightly hazardous). Use of NaOH caustic in a WGS would most likely occur at refineries that already use and store NAOH caustic for other purposes. Otherwise, the facility would need to construct a new NAOH caustic storage tank and ancillary piping and other associated equipment.

Soda Ash: For WGSs that may be installed to control SOx from SRU/TGUs, the caustic used in the WGS is made from soda ash, instead of NaOH. Soda ash is the common name for sodium carbonate (Na2CO3), a non-toxic, non-cancerous, and non-hazardous substance. Located on the MSDS for Na2CO3, the hazards ratings are as follows: health is rated 2 (moderate), flammability is rated 0 (none) and reactivity is rated 0 (none).

Based on the above information, additional use of caustic in a WGS would not cause or contribute to exceedances of any applicable hazards and hazardous materials significance thresholds.

3.4.4.7 Releases During Transport – Rules 11-18 and 12-16

3.4.4.7.1 Selective Oxidation Catalyst

A typical SRU/TGU system is not expected to require more than several hundred pounds of catalyst modules per year. As a result, delivery of catalyst modules can be accomplished in one truck trip. Based on their chemical properties, sulfur oxidation catalysts are not expected to pose significant adverse health or physical hazard impacts during use. Similarly, significant adverse hazards and hazardous materials impacts during use or transport of new catalysts to a facility or transport of spent catalysts for recycling are expected to be less than significant because of they do not pose adverse health or physical hazard impacts and, in the event of an accidental release, the modules would be easily contained and cleaned up.

3.4.4.7.2 Wet Gas Scrubber

Installation of a WGS would require deliveries of fresh caustic, either NaOH or soda ash. If an accidental release of caustic during transport occurs, potentially significant adverse hazards or hazardous materials impacts may be generated.

NaOH: Deliveries of NaOH (50 percent by weight) are typically made by tanker truck via public roads. The maximum capacity of one NaOH tanker truck is approximately 6,000 gallons. The projected consumption rates of NaOH are assumed to range from approximately 160 tons per year (T/Y) (0.44 tons per day (T/D)) to 1,228 T/Y (3.37 T/D) based on an analysis of WGS for refineries in southern California (SCAQMD, 2008). Based on worst-case assumptions, an affected refinery would need up to an additional 32 truck trips of NaOH caustic per year[1]. Although some of the affected refineries currently receive NaOH caustic, it is likely that they receive shipments periodically throughout the year rather than on a daily basis. Therefore, it is unlikely that an affected refinery would require one delivery per day in addition to any existing deliveries of NaOH caustic, instead it is likely that NaOH deliveries would occur on more days per year. Operators of trucks that transport hazardous materials by public highway are required to comply with requirements described in 49 CFR §§ 173 and 177. Hazardous materials impacts during the transport of NaOH caustic are considered to be less than significant. Facilities affected by Rule 11-18 may also use WGS; the associated hazardous materials impacts are expected to be less than the worst case scenario analyzed above for petroleum refineries and are thus found to be less than significant.

Soda Ash: Additional soda ash, catalyst and SOx reducing additives could be delivered to some of the affected facilities in the future, but no increase in transportation hazards is expected as none of these materials are considered to be hazardous.

[1] Annual NaOH deliveries are calculated based on one delivery truck holding 6,000 gallons per truck load. For example, 1,228 T/Y NaOH x 2,000 lbs/ ton = 2,465.000 lbs/yr x 1 gal NaOH @ 50%/12.77 lbs = 192,000 gal/year x 1 truck/6,000 gallons = 32 trucks/year

Based on the above information, accidental releases of caustic during transport would not cause or contribute to exceedances of any applicable hazards and hazardous materials significance thresholds.

3.4.5 MITIGATION MEASURES

3.4.5.1 Baghouses

To reduce potential fire or explosion impacts from baghouses, the following mitigation measures are required.

HHM-1 Maintain a comprehensive dust control program, with hazard dust inspections, testing, housekeeping, and control initiatives.

HHM-2 Ground the filter elements using grounding wires, rods, etc., to prevent sparks that could be generated during cleaning.

HHM-3 Install additional explosion rupture panels and vent outdoors

HHM-4 If the collector filters are to be replaced the first procedure is to remove as much flammable or explosive dusts from the filters as possible. Reverse the exhaust fan's direction to maintain a low flow and prevent dust from returning to the hood. Clean the collector one section at a time allowing time for the dust to settle into the collection hopper. After several complete cleaning cycles a large portion of the dust will be ejected, which is expected to lower the exposure of the worker in handling the filter elements.

HHM-5 Perform all hot work (welding, acetylene cutting, grinding, etc.) away from the collector, if possible.

HHM-6 Ensure that power tools and impact hand tools (such as hammers, chippers, etc.) used by maintenance personnel that could present a sparking hazard are not used in high dust concentrations. When such work is being performed on the structure itself, make certain the dust concentrations within the enclosure are well below combustible levels.

HHM-7 Ensure adherence to National Fire Protection Agency (NFPA) standards including, but not limited to, NFPA 499, Recommended Practice for the Classification of Combustible Dusts and of Hazardous (classified) Locations for Electrical Installations in Chemical Process Areas

Implementing the above mitigation measures is expected to ensure that hazard and hazardous materials impacts would not exceed any applicable hazards and hazardous materials significance thresholds, therefore, hazards and hazardous materials impacts from baghouses are concluded to be less than significant.

3.4.5.2 Dry Electrostatic Precipitators

Research of dry ESPs over the last 20 years has shown that this type of air pollution control equipment is generally safe to use. However, to ensure that potential fire and explosion risks are less than significant, the following safety mitigation measures have been identified.

HHM-8 Fire and explosion risks can be reduced by equipping dry ESPs with CO sensors that send a signal to a safety system to stop the process when CO concentrations exceed the critical limit. This solution reduces the risk dramatically.

HHM-9 Modern digital electronic controls shall be used to automate this process to assure the dry ESP operates at peak performance levels at all times.

HHM-10 The bottom and top of each wire should be covered with shrouds to help minimize sparking and metal erosion at these points.

HHM-11 To further reduce fire and explosion hazards, affected refinery operators shall establish the inspection frequency of all dry ESP components through a formal in-house maintenance procedure. Vendors' recommendations for an inspection schedule shall be followed and shall include at a minimum, the following procedures.

Daily: On a daily basis operation of hoppers and ash removal system should be checked; the control room ventilation system should be examined; any abnormal arcing in the ESP enclosure and ducts (typically caused by broken wires, which may swing freely causing shorting between discharge and collector electrodes) should be investigated; and electrodes should be checked.

Weekly: Air filters should be checked and cleaned on a weekly or more frequently.

Semianually: On a semiannual basis the operator should check the exterior for visual signs of deterioration, and abnormal vibration, noise, or leaks.

Implementing the above mitigation measures is expected to ensure that hazard and hazardous materials impacts would not exceed any applicable hazards and hazardous materials significance thresholds, therefore, hazards and hazardous materials impacts from dry ESPs are concluded to be less than significant.

3.4.6 SIGNIFICANCE CONCLUSION AND REMAINING IMPACTS

3.4.6.1 Implementation of Rule 11-18

With the exception of baghouses, the hazard impacts associated with the installation of air pollution control equipment under Rule 11-18 are expected to be less than significant without mitigation. For baghouses, feasible mitigation measures pursuant to CEQA Guidelines §15126.4 have been identified and are described in Chapter 3.4.5.1. The hazard impacts under implementation of Rule 11-18 are expected to be less than significant following mitigation.

3.4.6.2 Implementation of Rule 12-16

Installation of most types of air pollution control equipment is not expected to cause or contribute to significant adverse hazard impacts, with exception of baghouses or dry ESPs. As a result, feasible mitigation measures pursuant to CEQA Guidelines §15126.4 have been identified and are described in Chapter 3.4.5.2. The hazard impacts under implementation of Rule 12-16 are expected to be less than significant following mitigation.

3.4.6.3 Implementation of Both Rules 11-18 and 12-16

Assuming the adoption of both rules, it would be expected that more air pollution control equipment would be required to be installed as additional TAC emissions would be controlled, as well as additional refineries emissions may also be required to be controlled. As discussed in Chapter 3.4.4 the previous, installation of most air pollution control equipment would not generate additional hazard impacts. The potentially adverse hazard impacts associated with the installation of baghouses and ESPs are expected to be less than significant after mitigation.

3.4.6 CUMULATIVE IMPACTS

As concluded in the above hazards and hazardous materials analysis, installation of most types of air pollution control equipment, if required in the future, is not expected to cause or contribute to significant adverse hazard impacts, with the exception of baghouses or dry ESPs. As a result, feasible mitigation measures pursuant to CEQA Guidelines §15126.4 have been identified and were described. Implementing the mitigation measures identified in Sections 3.4.5.1 and 3.4.5.2 is expected to reduce significant adverse hazards and hazardous materials impacts to less than the applicable hazards and hazardous materials significance thresholds. Therefore, overall hazards and hazardous materials impacts, including accidental releases of hazardous materials during transport, were concluded to be less than significant. Because hazards and hazardous materials impacts do not exceed the applicable hazards and hazardous materials significance thresholds, they are not considered to be cumulatively considerable (CEQA Guidelines §15064 (h)(1)) and, therefore are not expected to generate significant adverse cumulative hazards and hazardous materials impacts.

CHAPTER 3.5

HYDROLOGY AND WATER QUALITY

3.5 HYDROLOGY AND WATER QUALITY

This subchapter of the EIR evaluates the potential hydrology and water quality impacts associated with implementation of Rules 11-18 and/or 12-16. Rule 12-16 would establish numeric emission limits on specific refinery and associated facilities within the Bay Area. Rule 11-18 would reduce exposure to TAC emissions from a number of stationary sources within the Bay Area, including refineries.

As discussed in the Initial Study, implementation of Rule 11-18 would reduce risk from facilities that emit toxic air contaminants throughout the Bay Area. Risk reduction measures are expected to be limited to new air pollution control equipment and construction of enclosures. The NOP/IS concluded that wet gas scrubbers were not expected to be used to control TACs; therefore, implementation of Rule 11-18 was not expected to result in a substantial increase in water use or wastewater discharge. However, public comments received on the NOP/IS indicated that wet gas scrubbers could be used to control TAC emissions from some refinery sources, such as FCCUs.

Implementation of Rule 12-16 would prevent refinery emissions of GHGs and some criteria pollutants from increasing. However, Rule 12-16 could require the installation of additional air pollution control equipment or modifications to refinery operations. Control measures for particulate matter and/or SOx emissions could require additional water use and wastewater discharge from devices like wet gas scrubbers. The NOP/IS (see Appendix A) determined that potential hydrology and water quality impacts associated with implementation of the proposed new Rule 12-16 are potentially significant. The NOP/IS determined that the potential flooding, flood hazards and increased stormwater runoff was less than significant for both rules as modifications would occur at existing facilities that have been graded and developed. Therefore, project-specific and cumulative adverse water demand and water quality impacts associated with implementation of proposed Rules 11-18 and 12-16 have been evaluated in Chapter 3.5 of this EIR.

3.5.1 ENVIRONMENTAL SETTING

3.5.1.1 Regional Hydrology

The state of California is divided into ten hydrologic regions corresponding to the state's major water drainage basins. The hydrologic regions define a river basin drainage area and are used as planning boundaries, which allows consistent tracking of water runoff, and the accounting of surface water and groundwater supplies. The Air District is within the San Francisco Bay Hydrologic Region (Bay Region) which includes all of San Francisco County and portions of Marin, Sonoma, Napa, Solano, San Mateo, Santa Clara, Contra Costa, and Alameda counties. It occupies approximately 4,500 square miles; from southern Santa Clara County to Tomales Bay in Marine County; and inlad to near the confluence of the Sacramento and San Joaquin rivers at the eastern end of Suisun Bay. The eastern boundary follows the crest of the Coast Ranges, where the highest peaks are more than 4,000 feet above mean sea level (DWR, 2013a).

Some water agencies in the region have imported water from the Sierra Nevada for nearly a century to supply their customers. Water from the Mokelumne and Tuolumne rivers accounts for about 38 percent of the region's average annual water supply. Water from the Sacramento-San Joaquin Delta (Delta), via the federal Central Valley Project (CVP) and the State Water Project (SWP), accounts for another 28 percent. Approximately 31 percent of the average annual water supply is from local groundwater and surface water, and 3 percent is from miscellaneous sources such as harvested rainwater, recycled water, and transferred water. Population growth and diminishing water supply and water quality have led to the development of local surface water supplies, recharge of groundwater basins, and incorporation of conservation guidelines to sustain water supply and water quality for future generations (DWR, 2013a).

The San Francisco Bay estuary system is one of the largest in the country and drains approximately 40 percent of the state's surface water from the Sierra Nevada and the Central Valley. The two major drainages, the Sacramento and San Joaquin Rivers, receive more than 90 percent of runoff during the winter and spring months from rainstorms and snow melt. Water from these drainages flows into what is known as the Delta region, then into the sub-bays, Suisun Bay and San Pablo Bay, and finally into the Central Bay and out the Golden Gate. Nearly half of the surface water in California starts as rain or snow that falls within the watershed and flows downstream toward the Bay. Much of the water flowing toward the Bay is diverted for agricultural, residential, and industrial purposes as well as delivery to distant cities of southern California as part of state and federal water projects.

San Francisco Bay encompasses approximately 1,600 square miles and is surrounded by the nine Bay Area counties of which seven borders the Bay. Other surface waters flow either directly to the Bay or Pacific Ocean. The drainage basin that contributes surface water flows directly to the Bay covers a total area of 3,464 square miles. The largest watersheds include Alameda Creek (695 square miles), the Napa River (417 square miles), and Coyote Creek (353 square miles) watersheds. The San Francisco Bay estuary includes deep-water channels, tidelands, and marshlands that provide a variety of habitats for plants and animals. The salinity of the water varies widely, as the landward flows of saline water and the seaward flows of fresh water converge near the Benicia Bridge. The salinity levels in the Central Bay can vary from near oceanic levels to one-quarter as much, depending on the volume of freshwater runoff (ABAG, 2013).

3.5.1.2 Surface Water Hydrology

The California Department of Water Resources (DWR) has grouped the watersheds in the Bay Region into six principle watersheds. These watersheds drain into Suisun Bay, San Pablo Bay, North San Francisco Bay, South San Francisco Bay, or directly into the Pacific Ocean. Large streams such as the Guadalupe River and Coyote and Alameda creeks, drain from the Coast Ranges and generally flow northwest into San Francisco Bay. The Alameda Creek watershed is the largest in the region at nearly 700 square miles. The Napa River originates in the Mayacamas Mountains at the northern end of Napa Valley and flows south into San Pablo Bay. Sonoma Creek begins in mountains within Sugarloaf State Park, then flows south through Sonoma Valley into San Pablo Bay. The major watersheds of the San Francisco Bay hydrologic region are summarized in Table 3.5-1.

TABLE 3.5-1
Watersheds of the San Francisco Bay Hydrologic Region

LOCATION	WATERSHED
North Bay	Corte Madera Creek Watershed
	Novato Creek Watershed
	Petaluma River Watershed
	Napa River Watershed
	Marin and North Bay Coastal Drainages(1)
Suisun Bay	GreenValley/Suisun Creeks watersheds
	Walnut Creek Watershed
	San Pablo/Wildcat Creeks Watersheds
	Suisun Bay Drainages(2)
East Bay	San Leandro Creek Watershed
	San Lorenzo Creek Watershed
	Alameda Creek Watershed
	East Bay Drainages(3)
South Bay	Coyote Creek Watershed
	Guadalupe River Watershed
	West Santa Clara Valley Drainages(4)
Peninsula	San Francisquito Creek Watershed
	San Mateo Creek Watershed
	San Mateo and Peninsula Coastal Drainages(5)

Source: AGAG, 2013
(1) Including Lagunitas Creek, Arroyo Corte Madera Creek, Miller Creek, etc.
(2) Including Sulphur Springs Creek, Laurel Creek, Mt. Diablo Creek, etc.
(3) Including Rodeo Creek, Cordonices Creek, Claremont Creek, Peralta Creek, Lake Merritt, etc.
(4) Including Stevens Creek, Permanente Creek, Saratoga Creek, etc.
(5) Including Cordilleras Creek, Colma Creek, Pilarcitos Creek, Pescadero Creek, San Gregorio Creek, etc.

The most prominent surface water body in the Bay Region is San Francisco Bay itself. Other surface water bodies include: creeks and rivers; ocean bays and lagoons (such as Bolinas Bay and Lagoon, Half Moon Bay, and Tomales Bay); urban lakes (such as Lake Merced and Lake Merritt); and human-made lakes and reservoirs (such as Lafayette Reservoir, Briones Reservoir, Calaveras Reservoir, Crystal Springs Reservoir, Kent Lake, Lake Chabot, Lake Hennessey, Nicasio Reservoir, San Andreas Lake, San Antonio Reservoir, San Pablo Reservoir, Upper San Leandro Reservoir, Anderson Reservoir, and Lake Del Valle).

3.5.1.2 Groundwater

A groundwater basin is an area underlain by permeable materials capable of storing a significant amount of water. Groundwater basins are closely linked to local surface waters. As water flows from the hills toward the Bay, it percolates through permeable soils into the groundwater basins. The nine-county Bay Area contains a total of 28 groundwater basins. The ten primary groundwater basins are the Petaluma Valley, Sonoma Valley, Suisun-Fairfield Valley, San Joaquin Valley, Clayton Valley, Diablo Valley, San Ramon Valley, Livermore Valley, and Santa Clara Valley basins. Groundwater in the Bay Area is used for numerous purposes, including municipal and industrial water supply; however, groundwater use accounts for only about five percent of the total water usage.

3.5.1.3 Water Quality

The San Francisco Bay Regional Water Quality Control Board (SFBRWQCB) is the lead agency charged with protecting and enhancing surface water and groundwater quality in the Bay Area. SFBRWQCB implements the Total Maximum Daily Load (TMDL) Program, which involves determining a safe level of loading for each problem pollutant, determining the pollutant sources, allocating loads to all of the sources, and implementing the load allocations. SFBRWQCB is taking a watershed management approach to runoff source issues, including TMDL implementation, by engaging all affected stakeholders in designing and implementing goals on a watershed basis to protect water quality.

The SFBRWQCB monitors pollutants through its Regional Monitoring Program; develops management strategies; and implements actions, including pollution prevention. San Francisco Bay and a number of the streams, lakes, and reservoirs in the Bay Region have elevated mercury levels, as indicated by elevated mercury levels in fish tissue. The major source of the mercury is local mercury mining and mining activities in the Sierra Nevada and coastal mountains. Large amounts of contaminated sediments were discharged into the Bay from Central Valley streams and local mines in the region. Significant impaired water bodies include the Bay, the Guadalupe River in Santa Clara County (from New Almaden Mine), and Walker Creek in Marin County (from Gambonini Mine). Consequently, the SFBRWQCB has adopted TMDLs for mercury in the Bay, Guadalupe River, and Walker Creek. Wastewater treatment plants and urban runoff also are a source of mercury, and some wetlands may contain significant amounts of methylmercury (the bioavailable form of mercury in the aquatic environment) from contaminated sediments (DWR, 2013a).

San Francisco Bay is a nutrient-enriched (nitrogen and phosphorus) estuary, but has not suffered from some of the problems found in other similar estuaries with high nutrient concentrations. Dissolved oxygen concentrations in the Bay's subtidal habitats are much higher, and phytoplankton levels are substantially lower than expected in an estuary with such high nutrient enrichment. The phytoplankton growth is limited by strong tidal mixing, reduced sunlight due to high turbidity, and grazing clams (DWR, 2013a).

Since the late 1990s, the Bay has experienced significant increases in phytoplankton biomass from Suisun Bay to the South Bay (30 to 105 percent) and significant declines in dissolved oxygen concentrations (2 to 4 percent). Also, cyanobacteria and dinoflagellate (red tide) blooms are occurring in portions of the bay. The SFBRWQCB is working collaboratively with stakeholders to evaluate the impacts of nutrients on water quality and to develop a regional nutrient management strategy (DWR, 2013a).

The rate and timing of freshwater inflows are among the most important factors influencing the physical, chemical, and biological conditions in San Francisco Bay. Retaining adequate freshwater inflows to the Bay is critical to protect migrating fish and estuarine habitat. Adequate inflows are necessary to control salinity, to maintain proper water temperature, and to flush out residual pollutants that cannot be eliminated by treatment or source management.

The Sacramento and San Joaquin Rivers flow into the eastern end of Suisun Bay, contributing most of the freshwater inflows to the bay. Many small rivers and streams also contribute fresh water. Much of the fresh water is impounded by upstream dams and is diverted to various water projects, which provide vital water to industries, farms, homes, and businesses throughout the state. The SFBRWQCB, the Central Valley Regional Water Quality Control Board, the SWRCB, and other stakeholders are working to improve Bay water quality by finding solutions to complex diversion issues. These agencies have formed the Bay-Delta Team to implement a long-term program that addresses impacts to beneficial uses of water in the bay and the Delta (DWR, 2013a).

Another water quality issue in the Bay Region is from stream channel erosion. An excess of sediment can be conveyed downstream, which leads to loss of riparian habitat and loss of spawning habitat for native salmonids. Stream erosion is accelerated by urbanization and additional impervious surfaces, land use conversion, rural development, and grazing. Many watersheds in the region are impaired by excessive sedimentation, a lack of large woody debris, and a lack of spawning gravels. The SFBRWQCB addresses these issues through its stormwater program, which regulates construction activities and controls erosion from developments; through working with flood control agencies on stream maintenance; and through its TMDL program, which sets load limits for discharge from sources such as roads, confined animal facilities, vineyards, and grazing lands. The SFBRWQCB also directs technical assistance and grant funding to locally managed watershed programs working on restoration projects and education and outreach efforts (DWR, 2013a).

3.5.1.4 Water Supply and Demand

The following water agencies serve the majority of the water demands in the Bay Area Region:

- Alameda County Water District (ACWD)
- Bay Area Water Supply and Conservation Agency (BAWSCA)
- Contra Costa Water District (CCWD)
- East Bay Municipal Utility District (EBMUD)
- Marin Municipal Water District (MMWD)
- City of Napa Water Department
- San Francisco Public Utilities Commission (SFPUC)
- Santa Clara Valley Water District (SCVWD)
- Solano County Water Agency (Solano CWA)
- Sonoma County Water Agency (Sonoma CW)
- Zone 7 Water Agency (Zone 7)

The Bay Area relies on imported water, local surface water, and groundwater for water supply. Local supplies account for about 30 percent of the total, and the remaining supply is imported from the State Water Project (SWP), Central Valley Project (CVP), and the Mokelumne and Tuolumne watersheds. In 2010, demand in the region was 1,278,480 acre-feet per year (af/yr)[1]. Demand is projected to grow to 1,680,963 af/yr in a normal year, and 1,666,870 af/yr in a single dry year by 2035 (see Table 3.5-1) (DWR, 2013a).

Some water agencies in the region have imported water from the Sierra Nevada for nearly a century to supply customers. EBMUD and SFPUC import surface water into the Bay Region from the Mokelumne and Tuolumne rivers via the Mokelumne and Hetch Hetchy aqueducts, respectively. Water from these two rivers accounts for approximately 38 percent of the average annual water supply in the Bay Area. Water from the Sacramento-San Joaquin Delta (Delta), via the federal CVP and the SWP, accounts for another 28 percent. Approximately 31 percent of the average annual water supply in the Bay Area comes from local groundwater and surface water; and three percent is from miscellaneous sources such as harvested rainwater, recycled water, and transferred water. Reservoirs in the region capture runoff to augment local water supplies and to recharge aquifers. Some reservoirs store water at the terminus of constructed aqueducts, such as the Santa Clara Terminal Reservoir at the terminus of the South Bay Aqueduct.

Many Bay Region residents get their water from local streams. In the South Bay, local streams supply water to the SFPUC, San Jose and other cities in Santa Clara County, cities in Alameda County, and to small developments in the surrounding mountains. The Alameda County Water District, Zone 7 Water Agency (Zone 7) and SCVWD recharge their groundwater basins with local streams, as well as with deliveries from the SWP and the CVP. Local streams also play a large role in the North Bay, providing a majority of the water supply for Marin and Napa counties. Population growth and diminishing water supply and water quality have led to the development of local surface water supplies, recharge of groundwater basins, and incorporation of conservation guidelines to sustain water supply and water quality for future generations (DWR, 2013a).

Bay Area water agencies manage a diverse portfolio of water supplies, including groundwater, local surface water, Sierra Nevada water from the Mokelumne and Tuolumne rivers, Delta water from the SWP and the CVP, and recycled water. San Francisco Public Utilities Commission (SFPUC), East Bay Municipal Utility District (EBMUD), and Santa Clara Valley Water District (SCVWD) have critical water interties to deliver water between water systems during emergencies such as earthquakes and wildfires. SWP contractors and DWR established the Monterey Agreement in 1994 to improve water management flexibility and increase the reliability of SWP deliveries during periods of water shortage (DWR, 2013a).

Historically, the Bay Area has experienced a significant increase in population with a minimal associated change in total water use. The Water Conservation Bill of 2009, or SBX7-7, provides the regulatory framework to support the statewide reduction in urban per capita water use. Each water retailer was required to determine and report its existing baseline water consumption and establish an interim target in their 2015 Urban Water Management Plan (UWMP) and a 2020 water use target in. Although water wholesalers are not required to meet the targets outlined in SBX7-7, many Bay Area wholesalers implement conservation programs and policies both to ensure

[1] One acre-foot of water is equal to approximately 325,851 gallons.

compliance with SBX7-7 and to ensure that long-term water supply reliability goals are met (San Francisco Bay Area IRWMP, 2013).

These demand management measures, combined with alternative resources and strategies, and regulatory requirements, are expected to allow Bay Area water agencies to continue to meet projected demand through 2035 in average years. However, in dry years all but four major agencies (Marin Municipal Water District, City of Napa, SFPUC and Zone 7) project a shortfall. Without strong local and regional planning, most Bay Area Region water agencies could experience future supply shortfalls in severe droughts. Supplies and demands of the Bay Area Region are summarized in Table 3.5-2 below and show that supplies are adequate through 2035 except in dry year scenarios, in which a shortfall is projected (San Francisco Bay Area IRWMP, 2013).

TABLE 3.5-2
Summary of Bay Area Region Water Supply and Demand

		Projected				
	Current	**Normal Year**		**Single Dry Year**		**Multiple Dry Year**
	2010	2020	2035	2020	2035	Worst Case
Population[1]	7,331,716	8,231,905	9,186,676	8,231,905	9,186,676	
Supply (AFY)	1,475,595	1,719,535	1,793,699	1,522,959	1,563,757	1,073,975
Demand (AFY)	1,278,480	1,534,534	1,680,963	1,517,778	1,666,870	1,197,143
Difference (AFY)	197,115	185,001	112,736	5,181	-103,113	-123,168

Source: IRWMP, 2013
Note: [1] Does not include Sonoma CWA

3.5.1.5 Drinking Water Quality

Drinking water in the Bay Region ranges from high-quality Mokelumne and Tuolumne River water to variable-quality Delta water, which constitutes about one-third of the domestic water supply. Purveyors that depend on the Delta for all or part of their domestic water supply can meet drinking water standards, but still need to be concerned about microbial contamination, salinity, and organic carbon.

In 2013, the SWRCB completed a statewide report titled, "Communities that Rely on a Contaminated Groundwater Source for Drinking Water." The report identified contaminated wells statewide that exceed a primary drinking water standard prior to any treatment or blending. In the Bay Region, 28 contaminated wells were identified that are used by 18 water systems. Most of the affected drinking water systems are small and often need financial assistance to construct a water treatment plant or another facility to meet drinking water standards. The most prevalent contaminants in the region are arsenic, nitrate, and aluminum (DWR, 2013a).

3.5.1.6 Recycled Water

In the 1990s, a number of local agencies joined with the DWR and the United States Bureau of Water Reclamation to study the feasibility of using high-quality recycled water to augment water supplies and help the Bay-Delta ecosystem. This cooperative effort, known as the Bay Area Regional Water Recycling Program (BARWRP), produced a Master Plan for regional water recycling in 1999 for the five South Bay counties. Since then, local water agencies have built a number of projects consistent with BARWRP, and recycled water has come to be widely used in the Bay Area for a number of applications, including landscape irrigation, agricultural needs, commercial and industrial purposes, and as a supply to the area's wetlands. The 2006 Bay Area Integrated Regional Water Management Plan (IRWMP) identified 43 potential recycled water projects that could be implemented by the year 2020 (ABAG, 2013). The potential market for recycled water is estimated to be 240,000 acre-feet per year by 2025. The region increased its recycled water use over 36 percent, from 29,500 af in 2001 to 40,300 af in 2009 (DWR, 2013a). The largest use of recycled water is for landscape irrigation, including golf courses, wetlands, industrial uses, and agricultural irrigation.

3.5.1.7 Wastewater Treatment

Wastewater is generated by residential, commercial and industrial sources throughout the Bay Area. The Clean Water Act requires treatment of wastewater for the protection of human health and receiving water bodies and preservation of the health of aquatic and riparian species. Wastewater treatment facilities consist of staged processes with the specific treatment systems authorized through NPDES permits. Primary treatment generally consists of initial screening and clarifying. Primary clarifiers are large pools where solids in wastewater are allowed to settle out. The clarified water is pumped into secondary clarifiers and the screenings and solids are collected, processed through large digesters to break down organic contents, dried and pressed, and either disposed of in landfills or used for beneficial agricultural applications. Secondary clarifiers repeat the process of the primary clarifiers further, refining the effluent.

Other means of secondary treatment include flocculation (adding chemicals to precipitate solids removal) and aeration (adding oxygen to accelerate breakdown of dissolved constituents). Tertiary treatment involves the removal of nutrients and nearly all suspended organic matter from wastewater, and may consist of filtration, disinfection, and reverse osmosis technologies. Chemicals are added to the wastewater during the primary and secondary treatment processes to accelerate the removal of solids and to reduce odors. Chlorine is often added to eliminate pathogens during final treatment, and sulfur dioxide is often added to remove the residual chlorine. Methane produced by the treatment processes can be used as fuel for the plant's engines and electricity needs. Recycled water must receive a minimum of tertiary treatment in compliance with DHS regulations. Water used to recharge potable groundwater supplies generally receives reverse osmosis and microfiltration prior to reuse.

Wastewater treatment in the Bay Area is provided by various agencies as well as individual city and town wastewater treatments. Treated wastewater is generally discharged into a water body, evaporation pond or percolation basin, or used recycled for agriculture, irrigation or landscaping.

The U.S. EPA's NPDES permit program affects how a municipality handles its sanitary wastewater. Tertiary treatment is now commonly required for discharges to bodies of water, particularly where there is potential for human contact. Properly managed wastewater treatment systems play an important role in protecting community health and local water quality

3.5.2 REGULATORY SETTING

There are a variety of overlapping federal, state and local regulations that regulate water resources and water quality. A number of federal regulations (e.g., the Clean Water Act) are primarily implemented by state agencies with oversight from the U.S. EPA. This section summarizes the more pertinent federal, state and local regulations on water resources.

3.5.2.1 Federal Regulations

3.5.2.1.1 Clean Water Act

The Clean Water Act (CWA) establishes the basic structure for regulating discharges of pollutants into "waters of the United States." The Act specifies a variety of regulatory and non-regulatory tools to sharply reduce direct pollutant discharges into waterways, finance municipal wastewater treatment facilities, and manage polluted runoff. Some of these tools include:

- Section 303(d) – Total Maximum Daily Loads (TMDLs);
- Section 401 – Water Quality Certification;
- Section 402 – National Pollutant Discharge Elimination System (NPDES) Program; and.
- Section 404 – Discharge of Dredge or Fill Material.

Section 303(d) – Total Maximum Daily Loads (TMDLs): The CWA §303(d) requires the SWRCB to prepare a list of impaired water bodies in the state and determine total maximum daily loads (TMDLs) for pollutants or other stressors impacting water quality of these impaired water bodies. A TMDL is a quantitative assessment of water quality conditions, contributing sources, and the load reductions or control actions needed to restore and protect bodies of water in order to meet their beneficial uses. All sources of the pollutants that caused each body of water to be included on the list, including point sources and non-point sources, must be identified. The California §303 (d) list was completed in March 1999. On July 25, 2003, U.S. EPA gave final approval to California's 2002 revision of §303 (d) List of Water Quality Limited Segments. A priority schedule has been developed to determine TMDLs for impaired waterways. TMDL projects are in various stages throughout the District for most of the identified impaired water bodies. The Regional Water Quality Control Boards are responsible for ensuring that total discharges do not exceed TMDLs for individual water bodies as well as for entire watersheds.

Section 401 – Water Quality Certification: The RWQCBs coordinate the State Water Quality Certification program, or CWA §401. Under CWA §401, states have the authority to review any federal permit or license that will result in a discharge or disruption to wetlands and other waters under state jurisdiction to ensure that the actions will be consistent with the state's water quality requirements. This program is most often associated with CWA §404 which obligates the U.S. Army Corps of Engineers to issue permits for the movement of dredge and fill material into and from "waters of the United States".

Section 402 – National Pollutant Discharge Elimination System (NPDES) Program: Section 402: Section 402 regulates point-source discharges to surface waters through the National Pollutant Discharge Elimination System (NPDES) program. In California, the State Water Resources Control Board (State Water Board or SWRCB) oversees the NPDES program, which is administered by the RWQCBs. The NPDES program provides for both general permits (those that cover a number of similar or related activities) and individual permits. The NPDES program covers municipalities, industrial activities, and construction activities. The NPDES program includes an industrial stormwater permitting component that covers ten categories of industrial activity that require authorization under an NPDES industrial stormwater permit for stormwater discharges. The NPDES permit establishes discharge pollutant thresholds and operational conditions for industrial facilities and wastewater treatment plants. For point source discharges (e.g., wastewater treatment facilities), the RWQCBs prepare specific effluent limitations for constituents of concern such as toxic substances, total suspended solids (TSS), bio-chemical oxygen demand (BOD), and organic compounds.

Construction activities, also administered by the State Water Board, are discussed below under state regulations. Section 402(p) of the federal Clean Water Act, as amended by the Water Quality Act of 1987, requires NPDES permits for stormwater discharges from municipal separate storm sewer systems (MS4s), stormwater discharges associated with industrial activity (including construction activities), and designated stormwater discharges, which are considered significant contributors of pollutants to waters of the United States. On November 16, 1990, U.S. EPA published regulations (40 CFR Part 122), which prescribe permit application requirements for MS4s pursuant to CWA 402(p). On May 17, 1996, U.S. EPA published an Interpretive Policy Memorandum on Reapplication Requirements for Municipal Separate Storm Sewer Systems, which provided guidance on permit application requirements for regulated MS4s. MS4 permits include requirements for post-construction control of stormwater runoff in what is known as Provision C.3. The goal of Provision C.3 is for the Permittees to use their planning authorities to include appropriate source control, site design, and stormwater treatment measures in new development and redevelopment projects to address both soluble and insoluble stormwater runoff pollutant discharges and prevent increases in runoff flows from new development and redevelopment projects. This goal is to be accomplished primarily through the implementation of low impact development (LID) techniques.

3.5.2.1.2 Safe Water Drinking Act (SDWA)

Passed in 1974 and amended in 1986 and 1996, the SDWA gives the U.S. EPA the authority to set drinking water standards. Drinking water standards apply to public water systems, which provide water for human consumption through at least 15 service connections, or regularly serve at least 25 individuals. There are two categories of drinking water standards, the National Primary

Drinking Water Regulations (NPDWR) and the National Secondary Drinking Water Regulations (NSDWR). The NPDWR are legally enforceable standards that apply to public water systems. NPDWR standards protect drinking water quality by limiting the levels of specific contaminants that can adversely affect public health and are known or anticipated to occur in water.

3.5.2.1.2 Section 10 of the Rivers and Harbors Act

Section 10 of the Rivers and Harbors Act, administered by United States Army Corp of Engineers (U.S. ACE), requires permits for all structures (such as riprap) and activities (such as dredging) in navigable waters of the U.S.

3.5.2.1.3 Executive Order 11990 – Protection of Wetlands

Executive Order 11990 is an overall wetlands policy for all agencies managing federal lands, sponsoring federal projects, or providing federal funds to state or local projects. Executive Order 11990 requires that when a construction project involves wetlands, a finding must be made by the federal agency that there is no practicable alternative to such construction, and that the proposed action includes all practicable measures to minimize impacts to wetlands resulting from such use.

3.5.2.1.4 Executive Order 11988 – Floodplain Management

Executive Order 11988 directs federal agencies to avoid to the extent practicable and feasible short- and long-term adverse impacts associated with the occupancy and modification of floodplains and to avoid direct and indirect support of floodplain development wherever there is a practicable alternative. Further, Executive Order 11988 requires the prevention of uneconomic, hazardous, or incompatible use of floodplains; protection and preservation of the natural and beneficial floodplain values; and consistency with the standards and criteria of the National Flood Insurance Program (NFIP).

3.5.2.1.5 National Flood Insurance Act

The U.S. Congress passed the National Flood Insurance Act (NFIA) in 1968 and the Flood Disaster Protection Act in 1973 to restrict certain types of development on floodplains and to provide for a national flood insurance program (NFIP). The purpose of these acts is to reduce the need for large, publicly funded flood control structures and disaster relief. The NFIP is a federal program administered by the Flood Insurance Administration of FEMA. It enables individuals who have property (a building or its contents) within the 100-year floodplain to purchase insurance against flood losses. Community participation and eligibility, flood hazard identification, mapping, and floodplain management aspects are administered by state and local programs and support directorate within FEMA. FEMA works with the states and local communities to identify flood hazard areas and publishes a flood hazard boundary map of those areas. Floodplain mapping is an ongoing process in the Bay Area and flood maps must be regularly updated for both major rivers and tributaries as land uses and development patterns change.

3.5.2.2 State Regulations

3.5.2.2.1 Porter-Cologne Water Quality Control Act

The Porter-Cologne Water Quality Control Act established the State Water Resources Control Board and divided the state into nine regions, each overseen by a RWQCB. The nine regional boards have the primary responsibility for the coordination and control of water quality within their respective jurisdictional boundaries. Under the Porter-Cologne Water Quality Control Act, water quality objectives are limits or levels of water quality constituents or characteristics established for the purpose of protecting beneficial uses. The Act requires the RWQCBs to establish water quality objectives while acknowledging that water quality may be changed to some degree without unreasonably affecting beneficial uses. Designated beneficial uses, together with the corresponding water quality objectives, also constitute water quality standards under the federal Clean Water Act. Therefore, the water quality objectives form the regulatory references for meeting state and federal requirements for water quality control.

Each RWQCB is required to prepare and update a Basin Plan for their jurisdictional area. Pursuant to the CWA NPDES program, the RWQCB also issues permits for point source discharges that must meet the water quality objectives and must protect the beneficial uses defined in the Basin Plan.

3.5.2.2.2 Construction General Permit

The California Construction Stormwater Permit (Construction General Permit), adopted by the State Water Resources Control Board, regulates construction activities that include clearing, grading, and excavation resulting in soil disturbance of at least one acre of total land area. Individual storm water NPDES permits are required for specific industrial activities and for construction sites greater than five acres. Statewide general storm water NPDES permits have been developed to expedite discharge applications. They include the statewide industrial permit and the statewide construction permit. A prospective applicant may apply for coverage under one of these permits and receive Waste Discharge Requirements (WDRs) from the appropriate RWQCB. WDRs establish the permit conditions for individual dischargers. The Stormwater Rule automatically designates, as small construction activity under the NPDES stormwater permitting program, all operators of construction site activities that result in a land disturbance of equal to or greater than one and less than five acres. Site activities that disturb less than one acre are also regulated as small construction activity if they are part of a larger common plan of development or sale with a planned disturbance of equal to or greater than one acre and less than five acres, or if they are designated by the NPDES permitting authority. The NPDES permitting authority or U.S. EPA Region may designate construction activities disturbing less than one acre based on the potential for contribution to a violation of a water quality standard or for significant contribution of pollutants to waters of the United States.

The Construction General Permit authorizes the discharge of stormwater to surface waters from construction activities. The Construction General Permit requires that all developers of land where construction activities will occur over more than one acre to develop and implement a Stormwater

Pollution Prevention Plan (SWPPP), which specifies Best Management Practices (BMPs) that will reduce pollution in stormwater discharges to the Best Available Technology Economically Achievable/Best Conventional Pollutant Control Technology standards; and, perform inspections and maintenance of all BMPs. Typical BMPs contained in SWPPPs are designed to minimize erosion during construction, stabilize construction areas, control sediment, control pollutants from construction materials, and address post construction runoff quantity (volume) and quality (treatment). The SWPPP must also include a discussion of the program to inspect and maintain all BMPs.

3.5.2.2.4 Drinking Water Standards

The California Safe Drinking Water Act, enacted in 1976, is codified in Title 22 of the CCR. The California Safe Drinking Water Act provides for the operation of public water systems and imposes various duties and responsibilities for the regulation and control of drinking water in the State of California including enforcing provisions of the federal Safe Drinking Water Act. The California Safe Drinking Water Program was originally implemented by the California Department of Public Health until July 1, 2014 when the program was transferred to the SWRCB via an act of legislation, SB 861. This transfer of authority means that the SWRCB has regulatory and enforcement authority over drinking water standards and water systems under Health and Safety Code §116271.

Potable water supply is managed through the following agencies and water districts: the California Department of Water Resources (DWR), the California Department of Health Services (DHS), the SWRCB, the U.S. EPA, and the U.S. Bureau of Reclamation. Water right applications are processed through the SWRCB for properties claiming riparian rights. The DWR manages the State Water Project (SWP) and compiles planning information on water supply and water demand within the state. Primary drinking water standards are promulgated in the CWA §304 and these standards require states to ensure that potable water retailed to the public meets these standards. Standards for a total of 88 individual constituents, referred to as Maximum Contaminant Levels (MCLs), have been established under the Safe Drinking Water Act as amended in 1986 and 1996. The U.S. EPA may add additional constituents in the future. The MCL is the concentration that is not anticipated to produce adverse health effects after a lifetime of exposure. State primary and secondary drinking water standards are codified in CCR Title 22 §§64431 - 64501. Secondary drinking water standards incorporate non-health risk factors including taste, odor, and appearance. The 1991 Water Recycling Act established water recycling as a priority in California. The Water Recycling Act encourages municipal wastewater treatment districts to implement recycling programs to reduce local water demands. The DHS enforces drinking water standards in California.

3.5.2.2.4 California Department of Fish and Wildlife

The California Department of Fish and Wildlife is responsible for conserving, protecting, and managing California's fish, wildlife, and native plant resources. To meet this responsibility, the Fish and Game Code (Section 1602) requires an entity to notify the Department of any proposed activity that may substantially modify a river, stream, or lake. The notification requirement applies to any work undertaken in or near a river, stream, or lake that flows at least intermittently through a bed or channel. This includes ephemeral streams, desert washes, and watercourses with a subsurface flow. It may also apply to work undertaken within the flood plain of a body of water.

3.5.2.2.5 Wastewater Treatment Regulations

The federal government enacted the CWA to regulate point source water pollutants, particularly municipal sewage and industrial discharges, to waters of the United States through the NPDES permitting program. In addition to establishing a framework for regulating water quality, the CWA authorized a multibillion dollar Clean Water Grant Program, which together with the California Clean Water Bond funding, assisted communities in constructing municipal wastewater treatment facilities. These financing measures made higher levels of wastewater treatment possible for both large and small communities throughout California, significantly improving the quality of receiving waters statewide. Wastewater treatment and water pollution control laws in California are codified in the CWC and CCR, Titles 22 and 23. In addition to federal and state restrictions on wastewater discharges, most incorporated cities in California have adopted local ordinances for wastewater treatment facilities. Local ordinances generally require treatment system designs to be reviewed and approved by the local agency prior to construction. Larger urban areas with elaborate infrastructure in place would generally prefer new developments to hook into the existing system rather than construct new wastewater treatment facilities. Other communities promote individual septic systems to avoid construction of potentially growth accommodating treatment facilities. The RWQCBs generally delegate management responsibilities of septic systems to local jurisdictions. Regulation of wastewater treatment includes the disposal and reuse of biosolids.

3.5.2.3 Local Regulations

3.5.2.3.1 McAteer-Petris Act/San Francisco Bay Conservation and Development Commission

The McAteer-Petris Act is a provision under California law that preserves San Francisco Bay from indiscriminate filling. The Act established the San Francisco Bay Conservation and Development Commission (BCDC) as the agency charged with preparing a plan for the long-term use of the Bay and regulating development in and around the Bay while the plan was being prepared. The San Francisco Bay Plan, completed in January 1969, includes policies on 18 issues critical to the wise use of the bay, ranging from ports and public access to design considerations and weather. The McAteer-Petris Act authorizes BCDC to incorporate the policies of the Bay Plan into state law. The Bay Plan has two features: policies to guide future uses of the bay and shoreline, and maps that apply these policies to the bay and shoreline. BCDC conducts the regulatory process in accordance with the Bay Plan policies and maps, which guide the protection and development of the bay and its tributary waterways, marshes, managed wetlands, salt ponds, and shoreline.

3.5.2.3.2 General Plan Safety Elements

Government Code §65302, as amended (2007 Cal. Stat. 369) requires that on or after January 1, 2009, the updated safety elements of general plans must incorporate significantly enhanced geographic data, goals, and policies related to flood hazards. This enhanced assessment of flood hazards will include, but is not limited to: flood mapping information from multiple agencies including FEMA, the Army Corps of Engineers, the Office of Emergency Services, the Department of Water Resources, and any applicable regional dam, levee, or flood protection agencies; historical data on flooding; an inventory of existing and planned development (including transportation infrastructure) in flood zones; and new policies that comprehensively address existing and future flood risk in the planning area.

3.5.2.3.3 Other Local Regulations

In addition to federal and state regulations, cities, counties and water districts may also provide regulatory advisement regarding water resources. Many jurisdictions incorporate policies related to water resources in their municipal codes, development standards, storm water pollution prevention requirements, and other regulations.

3.5.3 SIGNIFICANCE CRITERIA

The proposed project impacts on hydrology and water quality would be considered significant if the following occurs:

Water Demand:

- The existing water supply does not have the capacity to meet the increased demands of the project, or the project would use more than 262,820 gallons per day of potable water.

Water Quality:

- The project will cause degradation or depletion of ground water resources substantially affecting current or future uses.
- The project will cause the degradation of surface water substantially affecting current or future uses.
- The project will result in a violation of NPDES permit requirements.
- The capacities of existing or proposed wastewater treatment facilities and the sanitary sewer system are not sufficient to meet the needs of the project.

3.5.4 ENVIRONMENTAL IMPACTS

As discussed previously, the NOP/IS (see Appendix A) determined that the water demand and water quality impacts associated with implementation of proposed Rules 11-18 and 12-16 were potentially significant and would be evaluated further in the EIR. Implementation of Rules 11-18 and 12-16 could require more facilities to install new or modify their existing air pollution control equipment. Under Rule 11-18, if facilities exceed certain health risk limits, they would be required to make modifications to reduce the health risk associated with the facility which could include facility modifications, changes in operation, and/or modifications to existing or installation of new air pollution control equipment. Additional water demand and wastewater generation impacts are expected to result from the operation of several of the possible control technologies that would most likely be used (see Table 3.5-1).

3.5.4.1 Potential Water Demand Impacts

Rule 11-18

If any stationary sources are shown to exceed threshold limits for toxic air contaminants, it is expected that facility operators could install new, or modify their existing air pollution control equipment in order to reduce TAC emissions under Regulation 11-18. Most air pollution control equipment does not use water or generate wastewater (see Table 3.5-1). However, additional water demand and wastewater generation impacts are expected to result from the operation of wet gas scrubbers which may be used for control of particulate TAC emissions (see Table 3.5-1).

Rule 12-16

If any refineries are shown to exceed the refinery-wide emissions limits for PM2.5, PM10, NOx or SO_2, it is expected that refinery operators would install new, or modify their existing air pollution control equipment in order to reduce emissions as required by Regulation 12-16. Additional water demand and wastewater generation impacts are expected to result from the operation of several of the possible control technologies that would most likely be used including wet electrostatic precipitators (ESPs) and wet gas scrubbers (see Table 3.5-1).

TABLE 3.5-1

Potential Control Technologies and Potential Water Use and Wastewater Generation During Equipment Operations

Applicable Rule	Potential Control Technology	Uses Water?	Exceeds Threshold?	Generates Wastewater?	Exceeds Threshold?
11-18 &12-16	Baghouse with HEPA Filters	No	No	No	No
11-18	Carbon Adsorption	No	No	No	No
12-16	Compressor	No	No	No	No
12-16	Cyclone	No	No	No	No
11-18 & 12-16	Diesel Oxidation Catalyst	No	No	No	No
11-18 & 12-16	Diesel Particulate Filter	No	No	No	No
12-16	Electrostatic Precipitator (Dry)	No	No	No	No
12-16	Electrostatic Precipitator (Wet)	Yes	No	Yes	No
12-16	Flue Gas Treatment (Additive to Existing Amine System)	No	No	No	No
12-16	Flue Gas Treatment (Merox Treatment)	No	No	No	No
12-16	LoTOx (see WGS)	No	No		
11-18 & 12-16	New Diesel ICEs	No	No	No	No
12-16	Selective Catalytic Reduction	No	No	No	No
12-16	Selective Oxidation Catalyst	No	No	No	No
12-16	Steam Ejector Technology				
12-16	SOx Reducing Additive	No	No	No	No
11-18	Thermal Oxidizer	No	No	No	No
12-16	Ultracat	No	No	No	No
11-18 & 12-16	Wet Gas Scrubber	Yes	Yes	Yes	No

It is difficult to project water demand impacts from SO_2, $PM_{2.5}$, and TAC control equipment for the following reasons. It is necessary to know the desired level of control to sufficiently reduce pollutant concentrations as appropriate. This in turn will determine the number of industrial facilities or refinery units that would need to be retrofitted with air pollution control equipment. It also necessary to know the size of the facilities/refinery unit, which affects exhaust flow rate calculated as dry cubic feet per minute at standard conditions, another necessary variable used to calculate water demand. To maintain fresh solution, fresh water must be added periodically using either sump overflow or blowdown. In the sump overflow method fresh water is added through an adjustable flow meter at a continuous rate while the sump liquid overflows into the scrubber drain at a predetermined location. In the blowdown method, liquid is forced to drain by the recirculation pump. Regardless of the replenishing method used, it is necessary to know the flow rate necessary to maintain fresh solution. The rate of evaporation from the system must also be factored into the calculation of water demand impacts, which, at a minimum, requires knowing the operating temperature and humidity. All of these factors require precise data from each facility operator for each piece of equipment, which is currently not available.

Demolition and construction activities to install air pollution control equipment have the potential to generate potential water demand and water quality impacts. For example, water is used during construction to reduce fugitive dust from any site preparation or grading activities. Potential water demand and water quality impacts during potential future construction activities will be evaluated in the subsections below.

Table 3.5-1 shows air pollution control equipment that would provide the best opportunities for obtaining further reductions of SO_2, $PM_{2.5}$, and TAC emissions from stationary sources that would be regulated by Rules 11-18 and/or 12-16. As shown in Table 3.5-1, not all control technologies use water as part of the emission control process and, therefore, would not be expected to contribute to water demand or water quality impacts. These control technologies will not be considered further in this analysis. Analyses of water demand and water quality impacts from control equipment that do use water as part of the control process are provided in the following subsections.

3.5.4.1.1 Dust Suppression Associated with Construction Activities

Installation of some types of relatively small air pollution control equipment, e.g., equipment, compressors, diesel oxidation catalysts, diesel particulate filters, and steam ejectors are not expected to require site preparation activities because the equipment is generally not very large and could often be constructed onto existing foundations. In the event that some site preparation is necessary for these types of control technologies, plots would be small in area, thus, requiring little water for fugitive dust control. Therefore, little or no water for dust suppression purposes is expected to be needed for construction of compressors, diesel oxidation catalysts, and diesel particulate filters, or the replacement of diesel ICEs with new diesel ICEs.

For large air pollution control equipment, e.g., ESPs, FGTs, WGSs, etc., site preparation activities requiring water for dust control would likely be necessary for relatively larger areas compared to compressors, diesel oxidation catalysts, diesel particulate filters, and steam ejectors. For example, it is assumed that one water truck per affected facility may be needed for dust suppression activities during the initial site preparation/earth moving to install large air pollution control equipment. One water truck used for dust control can hold approximately 6,000 gallons and it can be refilled over the course of the day if more than 6,000 gallons is needed. If one FGT unit (one of the largest types of potential air pollution control equipment that could be installed in response to future Regulation 11-18 or Regulation 12-16 emission reduction requirements), a typical system could require an area of approximately 6,000 square feet. By applying one gallon of water per square foot of disturbed area, at a minimum of two times per day to minimize fugitive dust, the total amount of water expected to be used for dust suppression is approximately 12,000 gallons per day for each affected facility. On windy days, it may be necessary to conduct a third water application. Thus, the total peak amount of water that could be used for dust suppression is approximately 18,000 gallons per facility per day. This analysis assumes that all water used for dust suppression activities is potable water. It is likely that some affected facilities have access to reclaimed water supplies, which could be used instead of potable water for dust suppression activities. Finally, once construction is complete, water demand for fugitive dust control activities would cease.

Even if all five affected refineries were to install one FGT with construction and, therefore, dust control activities occurring on the same days water demand for construction (90,000 gallons per day) would not exceed any applicable water demand significance threshold (262,820 gallons per day). Although assuming all five affected refineries would have the same level of fugitive dust control and water demand necessary to control fugitive dust is considered a conservative analysis, it is not likely to occur because other types of air pollution control technologies may be installed instead of FGT, the lengths of time necessary to engineer and construct the equipment, would differ, refinery sites may already be paved, thus, reducing the amount of area necessary for site preparation, etc. The same would be true for industrial facilities subject to Rule 11-18. It is doubtful that five large air pollution control equipment projects would be occurring simultaneously because of the same considerations. Once construction is completed, additional demand for water would end. Therefore, water demand for dust control activities would be much less than 90,000 gallons per day and is concluded to be less than significant.

3.5.4.1.2 Operation

<u>Wet Electrostatic Precipitator – Operation (Rule 12-16)</u>

Installation of wet ESPs may occur under 12-16 and would require additional water, which is used as part of the emission control process. Instead of clean water, it is likely that each affected refinery operator would utilize strip sour water or similar existing treated waste process water from elsewhere within each facility. Because existing sources of refinery wastewater, e.g., strip sour water or similar existing treated wastewater, could be used to operate a wet ESP, demand from installing new add-on control equipment would be minimal. In addition, as discussed in Subsection 3.5.4.2.2 below, wastewater from the wet ESP can be treated and recycled back to the wet ESP, further minimizing water demand impacts. Thus, the impacts of installing a wet ESP to comply with potential future emission reduction requirements pursuant to Regulation 12-16 on future water demand at an affected refinery are not expected to exceed any applicable water demand significance thresholds and, therefore, are concluded to be less than significant.

Wet Gas Scrubber – Operation (Rules 11-18 and 12-16)

A WGS removes SO_2 from the flue gas by using a liquid solution that can be regenerated. As a result, installation of a WGS would result in an increased demand for water at an affected facility. A WGS is one of the control technologies that could be used to remove SO2 (12-16) and particulates emissions (11-18 and 12-16) from flue gas using a liquid solution that can be regenerated. As a result, installation of a WGS would result in an increased water demand. For example, one wet ESP and one WGS were installed on the FCCU at the Phillips 66 Los Angeles Refinery to control sulfur oxide emissions, as well as PM10 and PM2.5 emissions. The environmental analysis for this project indicated that the expected water demand associated with the WGS was about 300 gallons per minute (432,000 gallons per day) (SCAQMD, 2007). WGS of this size are primarily designed for large emission sources (e.g., refineries and other large manufacturing facilities), but this technology can also be scaled down for use on smaller sources. The water demand from one new WGS would exceed the CEQA significance threshold for water demand of 263,000 gallons per day and, therefore, is considered to be significant.

Conclusion

Based upon the above considerations, water demand impacts from installing most types of air pollution control equipment that use water as part of the control process would not create water demand impacts that exceed the applicable water demand significance thresholds. However, it is likely that water demand impacts from installing a WGS would exceed applicable water demand significance thresholds and, therefore, water demand impacts are concluded to be significant.

3.5.4.2 Potential Water Quality Impacts

Increased demand for water from the various control technologies is limited to control technologies that use water (i.e., wet ESPs and WGS) and will be directly proportional to any increases in wastewater from affected facilities. However, as with quantifying water demand, there is insufficient information available to calculate the volumes of wastewater from control equipment for the following reasons. First, not all of the additional water demand generated by installing air pollution control equipment would ultimately be discharged as wastewater. In addition, some proportion of the increased water demand would be emitted as steam or would evaporate during the control process. To determine the evaporation rate it is necessary to know the operating temperature and humidity in the vicinity of the equipment, which are currently unknown. In addition, wastewater discharge requirements under a facility's Industrial Wastewater Discharge Permit (IWDP) and current wastewater discharge rates need to be known. To the extent possible and based on available information, water quality impacts from air pollution control technologies that use water as part of the control process are evaluated in the following subsections

3.5.4.2.1 Construction Activities

Dust Suppression

Water used for dust suppression activities typically wets the top one to two inches of soil, evaporates and then forms a soil crust. As a result, this water does not flow into storm drains, sewers or other water collection systems and, therefore, water runoff from dust suppression activities would not be expected to occur and water quality impacts from dust suppression activities are concluded to be less than significant.

3.5.4.2.2 Operation

Wet ESPs (Rule 12-16)

As noted above, an IWDP entitles each affected refinery to discharge wastewater. Since additional water would be needed as part of the wet ESP's pollution control process to comply with potential future requirements under Regulation 12-16, the proposed project could increase the wastewater generated by each affected refinery. However, instead of clean water, it is likely that each affected refinery operator would utilize strip sour water or similar existing treated waste process water from elsewhere within each facility.

Wastewater from the wet ESP is collected and flows into a sump where it is typically treated and recycled to minimize water demand and wastewater generated from the equipment. Once recycled, wastewater generated by the wet ESP can also be returned to the wet ESP, which further reduces the total amount of water required for air pollution control, as well as the amount of wastewater discharged into the sewer system. For some types of wet ESPs recirculation of treated water to the ESP may approach 100 percent (U.S. EPA Fact Sheet).

If wastewater from the wet ESP is recycled before being discharged, depending on the volume of the potential wastewater discharged, if it is not within the percent variation allowed by the local sanitation districts, each affected refinery may need to apply for a revision to its IWDP or other wastewater discharge permits to accommodate any additional discharges to the sanitary sewer system. However, because existing sources of refinery wastewater, e.g., strip sour water or similar existing treated waste process water, could be used to operate a wet ESP, additional wastewater generated from installing new add-on control equipment would be minimal. Using existing sources of wastewater could actually result in a net decrease in the amount of wastewater discharged from the affected refinery. Thus, the impacts of installing a wet ESP to comply with potential future emission reduction requirements pursuant to Regulation 12-16 on each affected refinery's wastewater discharge volumes and their IWDPs are not expected to exceed any applicable water quality significance thresholds and, therefore, are concluded to be less than significant.

Wet Gas Scrubber (Rules 11-18 and 12-16)

Water from a WGS can be treated and then recirculated back to the wet gas scrubber to be used again. Depending on a facility's wastewater treatment system, the rest of the effluent may be further treated and discharged to the sanitary sewer system. WGS are most likely to be used on large emission sources such as refinery units, gas turbines or other large industrial facilities that currently have wastewater discharges or wastewater treatment systems. Depending on the type of WGS, some water may be lost as steam. For these reasons, it is not expected that WGS wastewater would exceed a facility's current wastewater discharge limits, require changes to existing wastewater permit conditions, or require new wastewater permits. Refineries are large users of water, have large wastewater discharges, and have large wastewater treatment facilities. Other industrial facilities that would install WGSs would also be expected to be large facilities with existing ISDPs and existing wastewater treatment facilities. Changes to existing permit conditions would not likely be required and no violations of existing IWDPs, NPDES permits, or other wastewater permit limits are expected. Regardless of the facility, wastewater discharges from an industrial facility would be required to be discharged in compliance with applicable wastewater discharge permits. Therefore, water quality impacts from a WGS are not expected to exceed any applicable water quality significance thresholds, so water quality impacts during operation are concluded to be less than significant.

3.5.4.3 Conclusion

Based upon the above considerations, water quality impacts from installing most types of air pollution control equipment that use water as part of the control process would not exceed applicable water quality significance thresholds and, therefore, are concluded to be less than significant.

3.5.5 MITIGATION MEASURES

Because it was concluded that if Wet Gas Scrubbers are installed as a response to Rule 12-16 andor Rule 11-18, potential future water demand impacts from the proposed systems during operation would be significant, mitigation measures for water demand are required. Therefore, for any affected refinery that installs an air pollution control technology that increases demand for water, the following water demand mitigation measures will apply.

HWQ-1 When air pollution control equipment is installed and water is required for its operation, the refinery operator is required to use recycled water, if available, to satisfy the water demand for the air pollution control equipment.

HWQ-2 In the event that recycled water cannot be delivered to the affected refinery, the refinery operator is required to submit a written declaration with the application for a Permit to Construct for the air pollution control equipment, to be signed by an official of the water purveyor indicating the reason(s) why recycled water cannot be supplied to the project.

3.5.5.2 Remaining Impacts

Because of the prevalence of drought conditions in Northern California, in spite of implementing the mitigation measures identified above, water demand impacts during operation of the proposed project remain significant, in part because there is currently no guarantee that reclaimed water will be available to all of the affected facilities. Therefore, the proposed project will remain significant after mitigation for water demand.

With regard to water quality, it was concluded that impacts would be less than significant, so no mitigation measures are required.

3.5.6 MITIGATION MONITORING REQUIREMENTS

Mitigation measures have been proposed to reduce potentially significant water demand impacts. Mitigation monitoring and reporting for measures HWQ-1 and HWQ-2 are described in Table 3.5-2.

TABLE 3.5-2

Mitigation Monitoring for Hydrology and Water Quality Impacts

Proposed Rules 11-18 and 12-16 may have a significant adverse impact on water demand associated with operation of Wet Gas Scrubbers.	
Mitigation Measure	HWQ-1: The Air District will require that proof of recycled water use be provided as part of the Authority to Construct application. HWQ-2: The Air District will require that the written declaration that recycled water cannot be used as part of the Authority to Construct application.
Timing	Prior to construction
Methodology	MM AES-1 will be required in the contract specifications for the WSG cranes. MM AES-2 will be required as an operational control measure.
Responsible Parties	Applicant for information required as part of the air permit application. Air District for determination of justification for use or non-use of recycled water.
Residual Impacts	Significant after mitigation, as not all sources are expected to use recycled water.

3.5.7 CUMULATIVE IMPACTS

In the above analyses of construction water demand and water quality it was concluded that impacts would be less than significant. Similarly, it was concluded that water quality impacts from the proposed project during operation would be less than significant. Therefore, because construction water quality and water demand impacts and operational water quality impacts were concluded to be less than significant, they are not considered to be cumulatively considerable (CEQA Guidelines §15064 (h)(1)) and, therefore are not expected to generate significant adverse cumulative impacts these environmental topic areas.

In the above analysis of water demand impacts from the proposed project during operation it was concluded that installing a WGS has the potential to generate significant adverse operational water demand impacts. Therefore, water demand impacts during operation of the proposed project are considered to be cumulatively considerable (CEQA Guidelines §15064 (h)(1)).

CHAPTER 3.6 and 3.7

GROWTH INDUCING IMPACTS
SIGNIFICANT ENVIRONMENTAL EFFECTS WHICH CANNOT BE AVOIDED

3.6 GROWTH INDUCING IMPACTS

#

3.6.1 INTRODUCTION

CEQA defines growth-inducing impacts as those impacts of a proposed project that "could foster economic or population growth, or the construction of additional housing, either directly or indirectly, in the surrounding environment. Included in this are projects, which would remove obstacles to population growth" (CEQA Guidelines §15126.2(d)).

To address this issue, potential growth-inducing effects are examined through the following considerations:

- Facilitation of economic effects that could result in other activities that could significantly affect the environment;
- Expansion requirements for one or more public services to maintain desired levels of service as a result of the proposed Project modifications;
- Removal of obstacles to growth, e.g., through the construction or extension of major infrastructure facilities that do not presently exist in the project area or through changes in existing regulations pertaining to land development;
- Adding development or encroachment into open space; and/or
- Setting a precedent that could encourage and facilitate other activities that could significantly affect the environment.

3.6.2 ECONOMIC AND POPULATION GROWTH, AND RELATED PUBLIC SERVICES

The proposed rules would not directly foster economic or population growth or the construction of new housing in the Bay area. The proposed rules may require construction of air pollution control equipment or operational measures/modifications within the confines of the existing industrial facilities but would not be expected to involve new development outside of existing facilities. Therefore, it would not stimulate significant population growth, remove obstacles to population growth, or necessitate the construction of new community facilities that would lead to additional growth.

A project would directly induce growth if it would directly foster economic or population growth or the construction of new housing in the surrounding environment (e.g., if it would remove an obstacle to growth by expanding existing infrastructure). The proposed new rules would not remove barriers to population growth, as it involves no changes to General Plan, zoning ordinance, or related land use policy. The proposed new rules do not include the development of new housing or population-generating uses or infrastructure that would directly encourage such uses.

Therefore, proposed Regulations 11-18 and 12-16 would not directly trigger new residential development in the District.

Further, the proposed rules would not result in an increase in local population, housing, or associated public services (e.g. fire, police, schools, recreation, and library facilities) since the proposed amendments would not result in an increase in workers or residents. Likewise, the proposed amendments would not create new demand for secondary services, including regional or specialty retail, restaurant or food delivery, recreation, or entertainment uses. As such, the proposed amendments would not foster economic or population growth in the surrounding area in a manner that would be growth-inducing.

3.6.3 REMOVAL OF OBSTACLES TO GROWTH

The proposed rules would not employ activities or uses that would result in growth inducement, such as the development of new infrastructure (i.e., new roadway access or utilities, such as wastewater treatment facilities) that would directly or indirectly cause the growth of new populations, communities, or currently undeveloped areas. Likewise, the proposed rules would not result in an expansion of existing public service facilities (e.g., police, fire, libraries, and schools) or the development of public service facilities that do not already exist.

3.6.4 DEVELOPMENT OR ENCROACHMENTS INTO OPEN SPACE

Development can be considered growth-inducing when it is not contiguous to existing urban development and introduces development into open space areas. The proposed rules may require additional air pollution control equipment and measures within the confines of existing facilities and existing industrial areas. New development outside of the boundaries of industrial facilities is not expected to occur. Therefore, the proposed rules would not result in development within or encroachment into an open space area.

3.6.5 PRECEDENT SETTING ACTION

Proposed Rule 12-16 will enforce emission limits on existing refineries, while 11-18 would lead to further control of TAC emissions. These types of activities are currently required of refineries and other industrial facilities to comply with various regulatory requirements. GHG emissions from refineries are required to be tracked, reported to CARB under the AB32 GHG requirements, and GHG limits have been established on sources within California's Cap and Trade program, including refineries.

Emissions of TACs are currently required to be reported and HRAs are required to be prepared under AB2588 for various industrial facilities. Proposed Rule 11-18 would reduce the acceptable health risk limits for stationary sources of emissions. However, the requirement for the preparation of emission inventories and HRAs already exists under state law. Establishing thresholds, reporting emission inventories, conducting HRAs and additional monitoring requirements would not result in precedent-setting actions that might cause significant environmental impacts.

3.6.6 CONCLUSION

The proposed new rules would not be considered growth-inducing, because they would not result in an increase in production of resources or cause a progression of growth that could significantly affect the environment either individually or cumulatively.

3.7 SIGNIFICANT ENVIRONMENTAL EFFECTS WHICH CANNOT BE AVOIDED AND SIGNIFICANT IRREVERSIBLE ENVIRONMENTAL CHANGES

Section 15126.2(b) of the CEQA Guidelines requires that an EIR describe significant environmental impacts that cannot be avoided, including those effects that can be mitigated but not reduced to a less than significant level. As evaluated in the preceding portions of Chapter 3 of this EIR, the proposed rules 11-18 and 12-16 would result in potentially significant unavoidable impacts as identified in Table 3.7-1.

TABLE 3.7-1

IMPACTS IDENTIFIED AS POTENTIALLY SIGNIFICANT IN THIS EIR

RULE 11-18	RULE 12-16
NOx Emissions During Construction	NOx Emissions During Construction
NOx Emissions During Operation	Water Demand Impacts
GHG Impacts	
Water Demand Impacts	

CHAPTER 4

ALTERNATIVES ANALYSES

4.0 ALTERNATIVES ANALYSES

4.1 DISCUSSION OF ALTERNATIVES

An EIR is required to describe a reasonable range of feasible alternatives to the proposed project that could feasibly attain most of the basic project objectives and would avoid or substantially lessen any of the significant environmental impacts of the proposed project (CEQA Guidelines §15126.6(a)). As discussed in Chapter 3 of this EIR the proposed project could result in potentially significant impacts to air quality and GHG emissions during construction and hydrology (water demand) during project operation. Therefore, alternatives analysis should focus on alternatives that avoid or minimize these potentially significant impacts.

The objectives of proposed Rule 11-18: Toxic Risk Reduction are as follows:

1) Reduce the public's exposure to health risks associated with the emissions of TACs from stationary sources to the lowest levels achievable;
2) Incorporate the most up-to-date health risk methodologies and health values into the Air District's risk evaluation process for existing stationary sources of TACs;
3) Ensure the facilities that impact the most sensitive and overburdened communities reduce their associated health risk in an efficient and expeditious manner;
4) Provide the public opportunity to comment on the draft HRAs to provide transparency and clarity to the process; and
5) Provide the public opportunity to comment on risk reduction plans as they are drafted by the affected facilities.

And the objectives of proposed Rule 12-16: Refining Emission Limits are to:

1) Protect air quality, public health, and the climate from increases in annual facility-wide mass emissions of GHGs, PM, NOx, and SO_2 caused by changes in refinery oil feed quality or quantity, refinery or support equipment or operation, or combinations of these causes, by preventing any significant increase in these emissions;
2) Protect the climate and public health by preventing any significant increase in these emissions at refineries and associated facilities from increasing the emission intensity of the production of transportation fuels;
3) Protect community and public health by preventing any significant increase in these emissions from worsening hazards for which HRA methods may not account, including but not limited to acute and chronic ambient PM, NOx, SO_2, and PM exposure hazards; and
4) Complement other air quality, public health, and climate measures by discouraging investment in new refinery equipment that would lead to increased emissions of GHG, PM, NOx, or SO_2 from Bay Area refineries.

Chapter 4 provides a discussion of alternatives to the proposed project as required by CEQA. According to the CEQA guidelines, alternatives should include feasible measures to attain the basic objectives of the proposed project and provide means for evaluating the comparative merits of each alternative. In addition, though the range of alternatives must be sufficient to permit a reasoned choice, they need not include every conceivable project alternative (CEQA Guidelines, §15126.6(a)). The key issue is whether the selection and discussion of alternatives fosters informed decision making and public participation.

In accordance with CEQA Guidelines §15126.6(c), a CEQA document should identify any alternatives that were considered by the lead agency, but were rejected as infeasible during the scoping process and briefly explain the reason underlying the lead agency's determination. Section 15126.6(c) also states that among the factors that may be used to eliminate alternatives from detailed consideration in an EIR are: (1) failure to meet most of the basic project objectives; (2) infeasibility; or (3) inability to avoid significant environmental impacts.

The possible alternatives to the two proposed rules are limited by the nature of the project. The proposed Risk Reduction Rule is designed to minimize health risks associated with facilities that emit TAC emissions through the approval and implementation of risk reduction plans or the application of the best available retrofit control technology for toxics (TBARCT) to significant sources of toxic emissions. If the Air District fails to adopt this rule, portions of the rule could be implemented under other requirements, e.g., the AB 2588 Air Toxics "Hot Spots" Program.

The proposed Refining Emissions Limits Rule is intended to prevent significant increases in climate and criteria pollutants associated with combustion during refining operations. If the Air District fails to adopt this rule, portions of the rule could be implemented under draft Rule 13-1: Refinery Carbon Intensity and GHG Emissions Limits (if it were adopted) and other control measures contained in the draft 2017 Clean Air Plan.

This draft EIR will evaluate Project Alternatives for both Rules 11-18 and 12-16, including "No Project Alternatives" for both and additional alternatives deemed appropriate by Air District staff for evaluating the two rules.

4.2 DESCRIPTION OF THE PROJECT ALTERNATIVES: RULE 11-18

4.2.1 ALTERNATIVE 1.1 – NO PROJECT ALTERNATIVE (11-18)

CEQA Guidelines §151216.6 (e) requires evaluation of a "No Project Alternative." Under the No Project Alternative (11-18), the proposed rule would not be adopted and, thus, the Air District would not establish risk actions levels of 10/M for cancer health risk and 1.0 for both acute and chronic hazard indices. Although, portions of the rule could be implemented under the Air District's AB 2588 – Air Toxics "Hot Spots" Program, such as incorporating the new OEHHA health risk assessment protocols and health risk values and conducting health risk screening analyses and health risk assessments. Facilities with a cancer health risk greater than 10/M or an acute or chronic hazard index greater than 1.0[1] would only have to notify all exposed persons of their exposure. Facilities with a cancer risk greater than 100/M or a hazard indices greater than 10 would have to both 1) notify exposed individuals, and 2) reduce the facility health risk below the risk action level in accordance to the Air District AB 2588 Program, California Health and Safety Code, §§44300-44394.[2]

4.2.2 ALTERNATIVE 1.2 – SET RISK ACTION LEVEL AT 25/M CANCER AND 2.5 HAZARD INDICES

Under Alternative 1.2, the Air District would establish risk action levels at 25/M for cancer risk and 2.5 for hazard indices instead of 10/M and 1.0 respectively. Further, the significant risk level for the compliance alternative for the application of TBARCT would be set at 5/M for cancer and 0.5 hazard indices or removed.[3] All other aspects of the proposed rule would remain in place, including the provisions for the two compliance options: developing a risk reduction plan or demonstrating that all significant sources of risk are controlled with TBARCT. Under this alternative, the scope of the project would be significantly reduced because the rule would not apply to those facilities with health risks that are less than 25/M for cancer or 2.5 for hazard indices. As a result, the number of facilities affected by the rule would be reduced by from approximately 1,000 to fewer than 100 – an order of magnitude reduction. Table 4.1 illustrates the change of number of affected facilities by facility type.

Table 4.1: Comparison of the Numbers of Affected Facilities by Type under Proposed Rule 11-18 and Alternative 1.2

Facility Type	Proposed Rule 11-18	Alternative 1.2 Rule 11-18
Automotive Coating	1	0
Cement / Recycling	1	1
Cement Manufacturing	1	1
Chemical Plant	4	4
Chrome Plating	1	0
Concrete	1	0
Crematorium	16	4
Diesel Engines (only)		
Data Center	30	0

[1] Health risks of 10/M cancer and 1.0 hazard indices are current action levels for notification under the Air District's AB 2588 Air Toxics "Hot Spots" Program.

[2] Health risks of 100/M cancer and 10.0 hazard indices are the current action levels for risk reduction under AB 2588. It should be noted that Air District staff did not identify any facilities with a preliminary health risks greater than these action levels.

[3] Without the TBARCT compliance option, the rule would be, in effect, an implementation of the AB 2588 program with lower risk action levels.

Facility Type	Proposed Rule 11-18	Alternative 1.2 Rule 11-18
Emergency Standby	568	0
Engines and Other Sources	178	24
GDF	128	7
Landfill	28	16
Landfill + Sewage Treatment	2	0
Loading / Tanks	2	0
Metal Melting / Foundry	4	3
Miscellaneous Manufacturing	20	11
Other	136	0
Power Plant	17	10
Printing	1	0
Refinery	5	5
Research	2	0
Sewage Treatment	32	10
Soil Vapor Extraction	1	0
TOTALS	**1154**	**86**

As shown in Table 4.1, the requirements of the rule would still apply to major sources of risk, such as refineries, cement manufacturing, and waste water treatment facilities; however, the level to which those facilities must reduce their health risk would be 25/M instead of 10/M. Under this alternative, the number of individuals that remain exposed to elevated health risk levels posed by these facilities would be much greater than that under the proposal.

4.3 DESCRIPTION OF THE PROJECT ALTERNATIVES: RULE 12-16

4.3.1 ALTERNATIVE 2.1 – NO PROJECT ALTERNATIVE (12-16)

Under the No Project Alternative (12-16), the proposed rule would not be adopted and, thus, facility-wide emissions limits on GHGs, PM (PM_{10} and $PM_{2.5}$), NOx, and SO_2 would not be established. Therefore, the control of these emissions would likely continue to be addressed by the Air District current suite of programs, rules, regulations and any future measures contained in the draft 2017 Clean Air Plan and the State statues affecting climate pollutants. These methods of control include:

- Air District Rules affecting emissions of PM, NOx, and SO_2 from refineries and associated facilities.
- Control measures in the 2010 CAP not yet adopted;
- Rules and rule amendments in the Refinery Strategy;
- Control measures in draft 2017 CAP (not too speculative), including Rule 13-1; and
- AB 32 Cap and Trade Program, SB 32 and AB 197

The primary differences between Rule 12-16 and the No Project Alternative (12-16) is that the collection of measures listed referenced above would not only prevent the increase of climate and combustion criteria pollutants, but would result in substantial decreases of these pollutants over time (the proposal does not require emissions reductions).

4.3.1.1 Air Quality – Criteria Pollutants

Under the No Project Alternative (12-16), there would be no facility-wide emissions limits on the criteria pollutants PM, NOx, and SO_2. However, these pollutants are already being addressed by myriad Air District efforts. While this collection of measures would serve to significantly reduce the emission of these pollutants, they cannot, however, guarantee that these emissions would not increase from these facilities due to production increases or modifications to operations that are made for production reasons (that are allowed under current permit conditions) or that are required by other federal, state of local regulation.

4.3.1.2 Health Impacts – Toxic Air Contaminants and Fine Particulates

TACs: The No Project Alternative (12-16) would do little to reduce the emissions of toxic air contaminants and, therefore, risk. However, the adopted amendments to Rule 8-18 will reduce emissions of VOCs from fugitive emissions from refineries, including VOCs that are also TACs, such as benzene and 1,3-butadiene.

Fine PM: Fine PM is particulate matter with an aerodynamic radius of 2.5 microns or less, or "$PM_{2.5}$). The draft 2017 Clean Air Plan contain numerous control measures that would reduce both directly emitted PM and secondary formation of PM (which is primarily $PM_{2.5}$) from the emission of NOx and SO_2. These measures are listed in the table below.

Measure Number	Title	Pollutant(s) Addressed	Primary or Secondary PM
SS1	Fluid Catalytic Cracking in Refineries	PM	Primary
SS4	Refinery Flares	ROG, SO_2, PM	Both
SS5	Sulfur Recovery Units	SO_2	Secondary
SS6	Refinery Fuel Gas	SO_2	Secondary
SS7	Sulfuric Acid Plants	SO_2	Secondary
SS8	Coke Calcining	PM, SO_2	Both
SS9	Enhanced NSR Enforcement for Changes in Crude Slate	All Pollutants	Both
SS18	Basin-Wide Combustion Strategy	GHG, PM	Both
SS22	Stationary Gas Turbines	NOx	Secondary
SS31	General PM Emission Limitation	PM	Primary
SS32	Emergency Backup Generators	DPM, TAC	Primary
SS35	PM from Bulk Materials, including Coke and Coal	PM	Primary

4.3.1.3 Climate Protection – GHGs

Currently, there are only two control measures in the draft 2017 Clean Air Plan that would limit or reduce emissions of GHGs from refining operations: this proposed rule and SS12: Petroleum Refining Climate Impact Limits (draft Rule 13.1). Additionally, the AB 32 Cap-and-Trade program and SB 32 will not only limit GHG emissions from refining operation, they would require the reduction of these pollutants over time to meet the near-term, mid-term, and long-term GHG emissions reduction goals of the State's Climate Protection Program.

4.3.2 ALTERNATIVE 2.2 – IMPLEMENT RULES 11-18 AND 13-1

This alternative would consist of a combination of the environmental benefits and impacts of adopting and implementing proposed Rule 12-16 and draft Rule 13-1. Under this alternative, Rule 11-18 would reduce refinery health risks due to the emissions of toxic air contaminants to the lowest achievable levels, greatly reducing the health risks experienced by communities from refinery toxic emissions. Under proposed Rule 11-18, facilities that posed a health risk greater than the risk action levels of 10/M for cancer and 1.0 for hazard indices would have to either 1) reduce the facility health risk below the actions levels through the implementation of a risk reduction plan, or 2) demonstrate that all significant sources of risk at the facility are controlled with TBARCT.

Further, draft Rule 13-1 would ensure that refinery emission of GHGs are either limited to their current maximum capacity or are constrained by the refineries' carbon intensity based on their maximum capacity (also incorporating cost-saving energy efficiency measures). Draft Rule13-1 would complement and serve as a backstop for State climate protection efforts, which are anticipated to require a 20 percent reduction in refinery GHG emissions by 2030. Draft Rule 13-1 would:

- Set a carbon intensity limit for each refinery consistent with current operations
- Set a mass-based GHG emissions limit as an alternate compliance option
- Provide incentives for new energy improvement projects
- Accommodate new regulatory requirements and Air District permits.

4.4 ENVIRONMENTAL IMPACTS OF PROJECT ALTERNATIVES TO RULE 11-18

4.4.1 ALTERNATIVE 1.1 – NO PROJECT ALTERNATIVE (11-18)

4.4.1.1 Air Quality

Under the No Project Alternative (1), the proposed rule would not be adopted and, thus, the Air District would not establish risk actions levels of 10/M for cancer health risk and 1.0 for both acute and chronic hazard indices. Therefore, construction activities associated with installation of additional air pollution control equipment would be avoided. The construction activities associated with large air pollution control equipment, e.g., WGS, are potentially significant and this impact would not occur under the No Project Alternative (11-18). The operational air quality impacts associated with the proposed project were determined potentially significant. These operational emissions would also be avoided under the No Project Alternative (11-18). The potential beneficial impacts of the proposed project associated with additional risk and toxic emission reductions would not be realized under the No Alternative (11-18). Since the risk impacts of the affected facilities have not yet been determined, the amounts of risk and toxic emissions reductions that would not be realized under the No Project Alternative (11-18) are unknown. However, because there would be no additional operational emissions associated with the No Project Alternative (11-18), these impacts would be less than significant.

4.4.1.2 GHG Emissions

Under the No Project Alternative (11-18), the proposed rule would not be adopted and, thus, the Air District would not establish risk actions levels of 10/M for cancer health risk and 1.0 for both acute and chronic hazard indices. As a result, construction and operational activities associated with installation of additional air pollution control equipment would be avoided. Therefore, the GHG emissions associated with the No Project Alternative (11-18) would be less than significant.

4.4.1.3 Hazards and Hazardous Materials

Under the No Project Alternative (11-18), the proposed rule would not be adopted and, thus, the Air District would not establish risk actions levels of 10/M for cancer health risk and 1.0 for both acute and chronic hazard indices. As a result, construction and operational activities associated with installation of additional air pollution control equipment would be eliminated. The hazards associated with the proposed project were determined to be potentially significant for the operations of baghouses and ESPs. Hazards impacts associated with the potential installation of this equipment were determined to be less than significant after mitigation.

Under the No Project Alternative (11-18), there would be no additional construction and operational activities and hazards and the additional use of hazardous materials associated with implementation of Rule 11-18 would be avoided. Therefore, hazards and hazardous materials impacts associated with the No Project Alternative (11-18) would be less than significant.

4.4.1.4 Hydrology and Water Quality

Under the No Project Alternative (11-18), the proposed rule would not be adopted and, thus, the Air District would not establish risk actions levels of 10/M for cancer health risk and 1.0 for both acute and chronic hazard indices. As a result, construction and operational activities associated with installation of additional air pollution control equipment would be eliminated. Under Rule 11-18, water demand impacts were determined to be potentially significant, as the use of WGSs would potentially require a significant amount of water to operate. However, for this project water quality impacts were determined to be less than significant and, therefore, these impacts would be less than significant for the No Project Alternative (12-16).

Under the No Project Alternative (11-18), there would be no additional construction and operational activities and the additional water use and wastewater discharged associated with implementation of Rule 11-18 would be avoided. Therefore, hydrology and water quality impacts associated with No Project Alternative (11-18) would be less than significant.

4.4.2 ALTERNATIVE 1.2 – RISK ACTION LEVEL SET AT 25/M CANCER AND 2.5 HAZARD INDICES

4.4.2.1 Air Quality

Under Alternative 1.2, the Air District would establish risk action levels at 25/M for cancer risk and 2.5 for hazard indices instead of 10/M and 1.0 respectively. Further, the significant risk level for the compliance alternative for the application of TBARCT would be set at 5/M and 0.5 for hazard indices. Thus, there would be far fewer facilities that would be required to reduce their risk through the implementation of risk reduction measures and also fewer sources of risk that would have to be reduced. Therefore, construction activities associated with the installation of additional air pollution control equipment or implementation of risk reduction measures (such as increasing a stack's height or relocating equipment) would be greatly diminished. The construction activities associated with large air pollution control equipment, e.g., wet-gas scrubbers, are potentially significant and this impact would be greatly diminished under the Alternative 1.2.

The operational air quality impacts associated with the proposed project were determined to be less than significant and the operational emissions under Alternative 1.2 would be significantly less than that under the proposed project. A significant portion of the potential beneficial impacts of the proposed project associated with additional risk and emission reductions of TACs would also be eliminated under Alternative 1.2. Since the need for risk and emission reductions has yet to be determined, the amounts of risk and emissions reductions that would not occur under Alternative 1.2 are unknown. However, because the operational air quality impacts associated with Alternative 1.2 would be a fraction of that of the proposed project, the operational emissions associated with Alternative 1.2 would be less than significant.

4.4.2.2 GHG Emissions

Under Alternative 1.2, the Air District would establish risk action levels at 25/M for cancer risk and 2.5 for hazard indices instead of 10/M and 1.0 respectively. Further, the significant risk level for the compliance alternative for the application of TBARCT would be set at 5 or 2.5. Thus, there would be far fewer facilities that would be required to reduce their risk through the implementation of risk reduction measures and also few sources of risk that would have to be reduced. As a result, construction activities associated with installation of additional air pollution control equipment or implementation of risk reduction measures (such as increasing a stack's height or relocating equipment) would be greatly diminished. Therefore, GHG emission associated with Alternative 1.1 would be significantly less than that of proposed Rule 11-18.

4.4.2.3 Hazards and Hazardous Materials

Under Alternative 1.2, the Air District would establish risk action levels at 25/M for cancer risk and 2.5 for hazard indices instead of 10/M and 1.0 respectively. Further, the significant risk level for the compliance alternative for the application of TBARCT would be set at 5 or 2.5. Thus, there would be far fewer facilities that would be required to reduce their risk through the implementation of risk reduction measures and also fewer sources of risk that would have to be reduced. As a result, under Alternative 1.2, there would be far fewer additional construction and operational activities at the affected facilities and hazards and the additional use of hazardous materials associated with implementation of Rule 11-18 would be greatly diminished. Therefore, GHG emissions associated with the project under Alternative 1.2 would be less than significant.

4.4.2.3 Hydrology and Water Quality

Under Alternative 1.2, the Air District would establish risk action levels at 25/M for cancer risk and 2.5 for hazard indices instead of 10/M and 1.0 respectively. Further, the significant risk level for the compliance alternative for the application of TBARCT would be set at 5 or 2.5. This would result in there being far fewer facilities that would be required to reduce their risk through the implementation of risk reduction measures and also few sources of risk that would have to be reduced. Under this project, water demand impacts were determined to be potentially significant, as the use of WGSs would potentially require a significant amount of water to operate. Water quality impacts were determined to be less than significant.

Under Alternative 1.2 there would be no additional construction and operational activities at the refineries and the additional water use and wastewater discharged associated with implementation of Rule 11-18 would be greatly diminished. Therefore, hydrology and water quality impacts associated with Alternative 2.1 would be less than significant.

4.5 ENVIRONMENTAL IMPACTS OF PROJECT ALTERNATIVES TO RULE 12-16

4.5.1 ALTERNATIVE 2.1 – NO PROJECT ALTERNATIVE (12-16)

4.5.1.1 Air Quality

Under the No Project Alternative (12-16), the proposed rule would not be adopted and facility-wide emissions limits on GHGs, PM (PM_{10} and $PM_{2.5}$), NOx, and SO_2 would not be established. Therefore, potential construction and operational activities associated with installation of additional air pollution control equipment that would be needed to remain in compliance with Rule 12-16 would be eliminated. However, the construction and operational activities air quality impacts associated with large air pollution control equipment, e.g., WGS, are potentially significant and these air quality impacts may occur under the No Project Alternative (12-16) under the implementation of control measures listed in the Draft 2017 Clean Air Plan.

4.5.1.2 GHG Emissions

Under the No Project Alternative (12-16), the proposed rule would not be adopted and facility-wide emissions limits on GHGs, PM (PM_{10} and $PM_{2.5}$), NOx, and SO_2 would not be established. Potential construction activities associated with installation of additional air pollution control equipment that would be needed to remain in compliance with Rule 12-16 may not be eliminated. The GHG emissions associated with the proposed project were determined to be potentially significant for GHG emissions during construction and operational activities and less than significant for operational emissions. However, under the No Project Alternative (12-16), indirect GHG emissions impacts due to construction and operational activities associated with large air pollution control equipment, e.g., WGS, are potentially significant and these GHG emission impacts may occur under the implementation of control measures listed in the Draft 2017 Clean Air Plan.

4.5.1.3 Hazards and Hazardous Materials

Under the No Project Alternative (12-16), the proposed rule would not be adopted and facility-wide emissions limits on GHGs, PM (PM_{10} and $PM_{2.5}$), NOx, and SO_2 would not be established. Therefore, potential construction activities associated with installation of additional air pollution control equipment that would be needed to remain in compliance with Rule 12-16 would be eliminated. Therefore, construction and operational activities associated with installation of additional air pollution control equipment would be eliminated. The hazards associated with the proposed project were determined to be potentially significant for the operations of wet gas scrubbers. Hazards impacts associated with the potential installation of this equipment were determined to be less than significant after mitigation.

Under the No Project Alternative (12-16), there may be additional construction and operational activities at the refineries and hazards and the additional use of hazardous materials associated with implementation control measures listed in the Draft 2017 Clean Air Plan. Therefore, hazards and hazardous materials impacts associated with the No Project Alternative (12-16) were determined to be potentially significant.

4.5.1.4 Hydrology and Water Quality

Under the No Project Alternative (12-16), the proposed rule would not be adopted and facility-wide emissions limits on GHGs, PM (PM_{10} and $PM_{2.5}$), NOx, and SO_2 would not be established. Therefore, potential construction activities associated with installation of additional air pollution control equipment that would be needed to remain in compliance with Rule 12-16 would be eliminated. Additionally, the operational activities associated with operation of additional air pollution control equipment, such as wet gas scrubbers, would also be eliminated. Water demand impacts were determined to be potentially significant as the use of WGSs would potentially require a significant amount of water to operate.

Under the No Project Alternative (12-16), there would be no additional construction and operational activities at the refineries and the additional water use and wastewater discharged associated with implementation of Rule 12-16 would be eliminated. Therefore, hydrology and water quality impacts associated with the No Project Alternative (12-16) would be less than significant.

4.5.1.4 Utilities / Service Systems

Under the No Project Alternative (12-16), the proposed rule would not be adopted and facility-wide emissions limits on GHGs, PM (PM_{10} and $PM_{2.5}$), NOx, and SO_2 would not be established. Therefore, potential construction activities associated with installation of additional air pollution control equipment that would be needed to remain in compliance with Rule 12-16 would be eliminated. Additionally, the operational activities associated with operation of additional air pollution control equipment, such as wet gas scrubbers, would also be eliminated. The refineries affected by Rule 12-16 already exist and already use water, generate wastewater, treat wastewater, and discharge wastewater under existing wastewater discharge permits. The rule may potentially require additional air pollution control equipment. As a result, the rule may 1) exceed wastewater treatment requirements of the applicable Regional Water Quality Control Board; 2) require or result in the construction of new water or wastewater treatment facilities or expansion of existing facilities, the construction of which could cause significant environmental effects; 3) result in insufficient water supplies available to serve the project from existing entitlements and resources, or would require new or expanded entitlements; or 4) may result in a determination by the wastewater treatment provider which serves or may serve the project that it has inadequate capacity to serve the project's projected demand in addition to the provider's existing commitments. Under the No Project Alternative (12-16), these impacts may also occur due to the implementation of control measures in the Draft 2017 Clean Air Plan; therefore, the construction and operational utility impacts would be potentially significant.

4.5.2 ALTERNATIVE 2.2 – IMPLEMENT RULES 11-18 AND 13-1

4.5.2.1 Air Quality

Under Alternative 2.2, the emissions limits under Rule 12-16 that affect criteria pollutants: $PM_{2.5}$ and PM_{10}, NOx, and SO_2 would not be included under either Rule 11-18 or 13.1. (Emissions limits for GHGs would be established under draft Rule 13.1.) Therefore, potential construction and operational activities associated with installation of additional air pollution control equipment that would be needed to remain in compliance with the criteria pollutant emissions limits under Rule 12-16 would be eliminated. The construction and operational activities associated with large air pollution control equipment, e.g., WGS, are potentially significant and these air quality impacts would be avoided under Alternative 2.2 and, therefore, would be less than significant.

4.5.2.2 GHG Emissions

Under Alternative 2.2, the proposed rule would not be adopted and facility-wide emissions limits on PM (PM_{10} and $PM_{2.5}$), NOx, and SO_2 would not be established under either Rule 11-18 or 13.1. (Emissions limits for GHGs would be established under draft Rule 13.1.) The GHG emissions associated with the proposed project, Rule 12-16, were determined to be potentially significant for GHG emissions during construction activities and less than significant for operational emissions. Therefore, potential construction and operational activities and impacts associated with installation of additional air pollution control equipment that would be needed to remain in compliance with facility-wide emissions limits for PM, NOx, and SO_2 under Rule 12-16 would be eliminated and, therefore, would be less than significant.

4.5.2.3 Hazards and Hazardous Materials

Under Alternative 2.2, the proposed rule would not be adopted and facility-wide emissions limits on PM (PM_{10} and $PM_{2.5}$), NOx, and SO_2 would not be established. (Emissions limits for GHGs would be established under draft Rule 13.1.) Therefore, potential construction activities associated with installation of additional air pollution control equipment that would be needed to remain in compliance with Rule 12-16 would be eliminated. Therefore, construction and operational activities associated with installation of additional air pollution control equipment would be eliminated. The hazards associated with the proposed project were determined to be potentially significant for the operations of wet gas scrubbers. Hazards impacts associated with the potential installation of this equipment were determined to be less than significant after mitigation.

Under Alternative 2.2, there would be no additional construction and operational activities at the refineries and hazards and the additional use of hazardous materials associated with implementation of Rule 12-16 would be eliminated. Therefore, hazards and hazardous materials impacts associated with Alternative 2.2 would be less than significant.

4.5.2.4 Hydrology and Water Quality

Under Alternative 2.2, the proposed rule would not be adopted and facility-wide emissions limits on PM, NOx, and SO_2 would not be established. (Emissions limits for GHGs would be established under draft Rule 13.1.) Therefore, potential construction activities associated with installation of additional air pollution control equipment that would be needed to remain in compliance with Rule 12-16 would be eliminated. Additionally, the operational activities associated with operation of additional air pollution control equipment, such as wet gas scrubbers, would also be eliminated. Water demand impacts were determined to be potentially significant as the use of WGSs would potentially require a significant amount of water to operate.

Under Alternative 2.2, there would be no additional construction and operational activities at the refineries and the additional water use and wastewater discharged associated with implementation of Rule 12-16 would be eliminated. Therefore, hydrology and water quality impacts associated with Alternative 2.2 would be less than significant.

4.5.2.4 Utilities / Service Systems

Under the Alternative 2.2, the proposed rule would not be adopted and facility-wide emissions limits on PM, NOx, and SO_2 would not be established. (Emissions limits for GHGs would be established under draft Rule 13.1.) Therefore, potential construction activities associated with installation of additional air pollution control equipment that would be needed to remain in compliance with Rule 12-16 would be eliminated. Additionally, the operational activities associated with operation of additional air pollution control equipment, such as wet gas scrubbers, would also be eliminated. The refineries affected by Rule 12-16 already exist and already use water, generate wastewater, treat wastewater, and discharge wastewater under existing wastewater discharge permits. The rule may potentially require additional air pollution control equipment. As a result, the rule may 1) exceed wastewater treatment requirements of the applicable Regional Water Quality Control Board; 2) require or result in the construction of new water or wastewater treatment facilities or expansion of existing facilities, the construction of which could cause significant environmental effects; 3) result in insufficient water supplies available to serve the project from existing entitlements and resources, or would require new or expanded entitlements; or 4) may result in a determination by the wastewater treatment provider which serves or may serve the project that it has inadequate capacity to serve the project's projected demand in addition to the provider's existing commitments. Under Alternative 2.2, these impacts would be eliminated; therefore, the construction and operational utility impacts would be less than significant.

4.6 ENVIRONMENTALLY SUPERIOR ALTERNATIVE – RULE 11-18

Pursuant to CEQA Guidelines §15126.6(e)(2), if the environmentally superior alternative is the "no project" alternative, the EIR shall also identify an environmentally superior alternative among the other alternatives.

4.6.1 ALTERNATIVE 1.1 – THE NO PROJECT ALTERNATIVE (11-18)

Alternative 1.1 – the No Project Alternative (11-18) would reduce the potentially significant impacts associated with construction criteria pollutant and GHG emissions and water demand associated with the potential installation of additional air pollution control equipment to less than significant. The potential beneficial impacts of the proposed project associated with risk and emission reductions of TACs would also be eliminated under the No Project Alternative (11-18). Since the needs for risk and emission reductions have yet to be determined, the amount of emissions reductions that would not occur under Alternative 1.1 is unknown. Further, the No Project Alternative (11-18) would achieve only two of the project objectives:

2) Incorporate the most up-to-date health risk methodologies and health values into the Air District's risk evaluation process for existing stationary sources of TACs; and
4) Provide the public opportunity to comment on the draft HRAs to provide transparency and clarity to the process; and

4.6.2 ALTERNATIVE 1.2 – SET RISK ACTION LEVEL AT 25/M CANCER AND 2.5 HAZARD INDICES

The environmentally superior alternative is Alternative 1.2. Under Alternative 1.2, the Air District would establish risk action levels at 25/M for cancer risk and 2.5 for hazard indices instead of 10/M and 1.0 respectively. Further, the significant risk level for the compliance alternative for the application of TBARCT would be set at 5/M for cancer and 0.5 hazard indices or removed. Under this alternative, the scope of the project would be significantly reduced because the rule would not apply to those facilities with health risks that lie between either 10/M and 25/M for cancer or 1.0 and 2.5 for hazard indices. Thus, the number of facilities affected by the rule would be reduced by from approximately 1,000 to fewer than 100 – an order of magnitude reduction. Alternative 1.2 would eliminate or significantly reduce the air quality, water quality, and GHG emission impacts associated with the proposed project. Alternative 1.2 would achieve the following project objectives:

1) Incorporate the most up-to-date health risk methodologies and health values into the Air District's risk evaluation process for existing stationary sources of TACs;

2) Ensure the facilities that impact the most sensitive and overburdened communities reduce their associated health risk in an efficient and expeditious manner;
3) Provide the public opportunity to comment on the draft HRAs to provide transparency and clarity to the process; and
4) Provide the public opportunity to comment on risk reduction plans as they are drafted by the affected facilities.

4.7 ENVIRONMENTALLY SUPERIOR ALTERNATIVE – RULE 12-16

4.7.1 ALTERNATIVE 2.1 – THE NO PROJECT ALTERNATIVE (12-16)

Alternative 2.1 – the No Project Alternative (12-16) was determined to have potentially significant impacts in air quality and GHG emissions impacts, hazard and hazardous material impacts, hydrology and water quality impacts, utilities / service systems demand associated with the potential installation and operation of additional air pollution control equipment due to the implementation of several control measures contained in the draft 2017 Clean Air Plan. Therefore, the No Project Alternative (12-16) is not the environmentally superior alternative. However, No Project Alternative (12-16) would achieve the following project objectives:

1) Protect air quality, public health, and the climate from increases in annual facility-wide mass emissions of GHGs, PM, NOx, and SO_2 caused by changes in refinery oil feed quality or quantity, refinery or support equipment or operation, or combinations of these causes, by preventing any significant increase in these emissions;
2) Protect the climate and public health by preventing any significant increase in these emissions at refineries and associated facilities from increasing the emission intensity of the production of transportation fuels;
3) Protect community and public health by preventing any significant increase in these emissions from worsening hazards for which HRA methods may not account, including but not limited to acute and chronic ambient PM, NOx, SO_2, and PM exposure hazards; and
4) Complement other air quality, public health, and climate measures by discouraging investment in new refinery equipment that would lead to increased emissions of GHG, PM, NOx, or SO_2 from Bay Area refineries.

4.7.2 ALTERNATIVE 2.2 – IMPLEMENT RULES 11-18 AND 13-1

The environmentally superior alternative is Alternative 2.2. Under Alternative 2.2, the emissions limits under Rule 12-16 that affect criteria pollutants: $PM_{2.5}$ and PM_{10}, NOx, and SO_2 would not be included under either Rule 11-18 or 13.1. (Emissions limits for GHGs would be established under draft Rule 13.1.) Alternative 2.2 would have less than significant impacts for air quality, GHG emissions, hazard / hazardous material, hydrology and water quality, and utilities / service systems. Further, Alternative 2.2 would achieve the following project objectives:

1) Protect air quality, public health, and the climate from increases in annual facility-wide mass emissions of GHGs, PM, NOx, and SO_2 caused by changes in refinery oil feed quality or quantity, refinery or support equipment or operation, or combinations of these causes, by preventing any significant increase in these emissions;
2) Protect the climate and public health by preventing any significant increase in these emissions at refineries and associated facilities from increasing the emission intensity of the production of transportation fuels;
3) Protect community and public health by preventing any significant increase in these emissions from worsening hazards for which HRA methods may not account, including but not limited to acute and chronic ambient PM, NOx, SO_2, and PM exposure hazards; and
4) Complement other air quality, public health, and climate measures by discouraging investment in new refinery equipment that would lead to increased emissions of GHG, PM, NOx, or SO_2 from Bay Area refineries.

4.8 COMPARISON OF ALTERNATIVES

Pursuant to CEQA Guidelines §15126.6(d), an EIR should include sufficient information about each alternative to allow meaningful comparison with the proposed project. Section 15126.6(d) also recommends the use of a matrix to summarize the comparison. Tables 4-2a and 4-2b below provide these matrix comparisons. The CEQA document shall include sufficient information about each alternative to allow meaningful evaluation, analysis, and comparison with the proposed project (CEQA Guidelines §15126.6(d)). A matrix displaying the major characteristics and significant environmental effects of each alternative may be used to summarize the comparison. Tables 4-2a and 4-2b at the end of this section list the alternatives considered in this EIR and how they compare to the two proposed rules. Table 4-10 presents a matrix that lists the significant adverse impacts associated with the proposed project and the project alternatives for all environmental topics analyzed. The tables also rank each section as to whether the proposed project or a project alternative would result in greater or lesser impacts relative to one another.

4.8.1 COMPARISON OF ALTERNATIVES TO RULE 11-18

Alternative 1.1 – No Project Alternative (11-18) was determined to result in less than significant environmental impacts. Compared to the other project alternative, the No Project Alternative (11-18) would not achieve the critical project objective of health risk reductions. It would achieve only two of the objectives of the proposed project (Rule 11-18): Objectives 2 and 4. Because the current risk action levels established by the Air Toxic "Hot Spots" Program would remain unchanged, this alternative would not result in any facilities having to reduce their health risk nor having to develop a risk reduction plan because preliminary analyses show that there are likely no facilities that would pose a health risk in excess of the current risk action levels of 100/M for cancer and 10 for hazard indices.

Alternative 1.2 was determined to result in less than significant environmental impacts while achieving, to a lesser extent, the critical project objective of health risk reductions at some of the affected facilities (Objective 1) and expeditiously reduce health risk in impacted communities (Objective 3). This alternative would also achieve the remaining three objectives.

The proposed project has been demonstrated to be the most effective project that achieves all of the project objective relative to environmental impact generated. Mitigation measures have been developed to minimize the potential increase in water demand, while providing the greatest public health benefit by reducing health risk from stationary sources to the greatest feasible extent. Therefore, the proposed project is the preferred alternative.

4.8.2 COMPARISON OF ALTERNATIVES TO RULE 12-6

Alternative 2.1 – No Project Alternative (12-16) was determined to result in potentially significant environmental impacts, while achieving most of the project alternatives.

Alternative 2.2 would achieve all the project alternative to a greater extent than the proposed project, with an equivalent level of the environmental impacts as the propose project. A combination of Rule 11-18 and Rule 13-1 would directly reduce health risks from refining operations through the implementation of risk reduction measures and limit GHG emissions from refining operation without the anticipated legal pitfalls associated with the proposed project. Therefore, the Alternative 2.2 is the preferred alternative.

Table 4-2a
Comparison of Alternatives to Proposed Rule 11-18

Environmental Topic	Proposed Project	No Project Alternative (11-18)	Alternative 1.2
Air Quality			
Air Quality Benefits	B	B(-)	B(-)
Air Quality Impacts	S	NS(-)	NS(-)
Toxic Air Contaminants	B	B(-)	NS(-)
GHG			
GHG Reductions	NS	NS(=)	NS(-)
GHG Impacts	S	NS(-)	S(-)
Hazards & Hazardous Materials			
Hazard Impacts	S	S(-)	S(-)
Hydrology / Water Quality			
Water Demand Impacts	S	NS(-)	S(-)
Water Quality Impacts	NS	NS(-)	NS(-)
Utilities / Service Systems			

Environmental Topic	Proposed Project	No Project Alternative (11-18)	Alternative 1.2
Electricity Demand Impacts	S	NS(-)	S(-)
Solid / Hazardous Waste Impacts	S	NS(-)	S(-)

Table 4-2b
Comparison of Alternatives to Proposed Rule 12-16

Environmental Topic	Proposed Project	No Project Alternative (12-16)	Alternative 2.2
Air Quality			
Air Quality Benefits	B	B(+)	B(+)
Air Quality Impacts	S	S(+)	S(-)
Toxic Air Contaminants	NS	NS(+)	B(+)
GHG			
GHG Reductions	NS	NS(+)	NS(=)
GHG Impacts	S	S(+)	S(=)
Hazards & Hazardous Materials			
Hazard Impacts	S	S(+)	S(-)
Hydrology / Water Quality			
Water Demand Impacts	S	S(+)	S(-)
Water Quality Impacts	S	S(+)	S(-)
Utilities / Service Systems			
Electricity Demand Impacts	S	S(+)	S(-)
Solid / Hazardous Waste Impacts	S	S(+)	S(-)

Notes:
S = Significant
NS = Not Significant
MNS = Mitigated Not Significant
B = Beneficial
B(-) = Beneficial impacts of the alternative would be less than the proposed project.
(-) = Potential impacts are less than the proposed project.
(+) = Potential impacts are greater than the proposed project.
(=) = Potential impacts are approximately the same as the proposed project.

CHAPTER 5

REFERENCES

References
Organizations and Persons Consulted
List of Environmental Impact Report Preparers

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5.2 ORGANIZATIONS AND PERSONS CONSULTED

The CEQA statues and Guidelines require that organizations and persons consulted be provided in the EIR. The following organizations and persons have provided input into this document.

Alexander Crockett
Victor Douglas
William Guy
Karen Kristiansson
Greg Nudd
Josh Pollak
Eric Stevenson
Dave Vintze

5.3 LIST OF ENVIRONMENTAL IMPACT REPORT PREPARERS

Bay Area Air Quality Management District
San Francisco, California

Environmental Audit, Inc.
Placentia, California

CalEnviro Metrics, LLC
Bellingham, Washington

APPENDIX A

NOTICE OF PREPARATION AND INITIAL STUDY

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BAY AREA
AIR QUALITY
MANAGEMENT
DISTRICT

California Environmental Quality Act

Notice of Preparation of Draft Environmental Impact Report for Regulation 11: Hazardous Pollutants, Rule 18: Reduction of Risk from Air Toxic Emissions at Existing Facilities (Rule 11-18) and Regulation 12: Miscellaneous Standards of Performance, Rule 16: Petroleum Refining Facility-Wide Emissions Limits (Rule 12-16).

Lead Agency: **Bay Area Air Quality Management District**
Contact: **Greg Nudd** **Phone: (415) 749-4786**

SUBJECT: NOTICE OF PREPARATION OF A DRAFT ENVIRONMENTAL IMPACT REPORT

Notice is hereby given pursuant to California Public Resources Code §21091, 21092, 21092.2, and 21092.3 and CEQA Guidelines Section 15085 and 15087 that the Bay Area Air Quality Management District ("Air District"), as lead agency, will prepare a Draft Environmental Impact Report (EIR) in connection with the projects described below.

Project Title: Air District Regulation 11: Hazardous Pollutants, Rule 18: Reduction of Risk from Air Toxic Emissions at Existing Facilities (Rule 11-18) and Regulation 12: Miscellaneous Standards of Performance, Rule 16: Petroleum Refining Facility-Wide Emissions Limits (Rule 12-16).

Project Location: The rules would apply within the Bay Area Air Quality Management District ("District"), which includes all of Alameda, Contra Costa, Marin, Napa, San Francisco, San Mateo, and Santa Clara counties, and the southern portions of Solano and Sonoma counties.

Project Description: Rule 11-18 would ensure that emissions of toxic air contaminants (TACs) from existing facilities do not pose an unacceptable health risk to people living and working nearby. The rule would use the most up-to-date assumptions about the risk of compounds and would require affected facilities to take action to reduce risk to a low level.

Rule 12-16 would limit the emissions of climate pollutants: greenhouse gases (GHGs); and three criteria pollutants: particulate matter (PM), oxides of nitrogen (NOx), and sulfur dioxide (SO_2) from the five Bay Area petroleum refineries and three associated facilities. The rule would establish facility-wide emissions limits for the covered pollutants at each of the affected facilities to ensure there is no emissions increase due to changes in operation, crude or product slates, or increases in production.

Scoping Meetings: Notice is also given pursuant to California Public Resource Code, Sections 15206 and 15082 (c) that the Air District will conduct California Environmental Quality Act (CEQA) scoping meetings at the Air District Headquarters' Yerba Buena Room, 375 Beale Street, San Francisco, California, on November 14, 2016 at 2:00 p.m. and at the Martinez City Hall, 525 Henrietta Street, Martinez, California, on November 16, 2016 at 2:00 p.m. to discuss and accept oral comments on the scope and content described in a Notice of Preparation and an Initial Study (NOP/IS) prepared in anticipation of a draft Environmental Impact Report (DEIR) that would be prepared for two new proposed rules.

Reviewing the Notice of Preparation/Initial Study (NOP/IS): The NOP/IS are available at the District headquarters or on the Air District's website at http://www.baaqmd.gov/rules-and-compliance/rule-development/regulatory-workshops or by request. Requests for copies of the NOP/IS should be directed to Jocelyn Orpia (jorpia@baaqmd.gov) at (415) 749-4763.

Comment Procedure: Comments relating to the environmental analysis in the NOP/IS should be addressed to Victor Douglas, Bay Area Air Quality Management District, 375 Beale Street, Suite 600, San Francisco, CA 94105. Comments may also be sent by e-mail to vdouglas@baaqmd.gov. Comments on the NOP/IS will be accepted from October 14, 2016 until December 2, 2016 at 5:00 p.m.

BAY AREA
AIR QUALITY
MANAGEMENT
DISTRICT

CEQA NOTICE OF PREPARATION OF A DRAFT ENVIRONMENTAL IMPACT REPORT

October 14, 2016

To: Interested Parties

From: Executive Officer/APCO

Subject: Notice of Preparation of a Draft Environmental Impact Report

Project Title: Air District Regulation 11: Hazardous Pollutants, Rule 18: Reduction of Risk from Air Toxic Emissions at Existing Facilities (Rule 11-18) and Regulation 12: Miscellaneous Standards of Performance, Rule 16: Petroleum Refining Facility-Wide Emissions Limits (Rule 12-16).

In accordance with the California Environmental Quality Act (CEQA) (California Code of Regulations, Title 14, Sections 15082(a)), the Bay Area Air Quality Management District (District) will be the Lead Agency for the project identified above and described in the attached Initial Study. Through this Notice of Preparation (NOP), the District is soliciting information and your views on the scope of the environmental analysis for the project. As detailed in the attached Initial Study, District staff has made a preliminary determination that the potential air quality, greenhouse gas, hazard, and hydrology/water quality impacts of the rules require more detailed analyses in an Environmental Impact Report (EIR).

Due to the time limits mandated by State law, your response must be sent at the earliest possible date but not later than 30 days after receipt of this notice. Comments focusing on your area of expertise, your agency's area of jurisdiction, or issues relative to the environmental analysis should be addressed to Mr. Victor Douglas at the address shown below, or by e-mail to vdouglas@baaqmd.gov. Comments must be received no later than 5:00 PM on December 2, 2016. Please include the name and phone number of the contact person for your agency. Questions relative to the proposed Rule amendments should be directed to Mr. Victor Douglas (415) 749-4752, or by email to vdouglas@baaqmd.gov.

The following CEQA scoping meetings are scheduled for the rules:

Air District Headquarters Yerba Buena Room 375 Beale Street San Francisco, California November 14, 2016 at 2:00 p.m.	Martinez City Hall 525 Henrietta Street Martinez, California November 16, 2016 at 2:00 p.m

Date: *October 14, 2016* *Signature:*

Greg Nudd
Rule Development Manager

BAY AREA AIR QUALITY MANAGEMENT DISTRICT
375 Beale Street, Suite 600, San Francisco, California 94105

NOTICE OF PREPARATION OF A DRAFT ENVIRONMENTAL IMPACT REPORT

Project Title:
Air District Regulation 11: Hazardous Pollutants, Rule 18: Reduction of Risk from Air Toxic Emissions at Existing Facilities (Rule 11-18) and Regulation 12: Miscellaneous Standards of Performance, Rule 16: Petroleum Refining Facility-Wide Emissions Limits (Rule 12-16).

Project Location:
The rules would apply within the Bay Area Air Quality Management District ("District"), which includes all of Alameda, Contra Costa, Marin, Napa, San Francisco, San Mateo, and Santa Clara counties, and the southern portions of Solano and Sonoma counties.

Description of Nature, Purpose, and Beneficiaries of Project:
Rule 11-18 would ensure that emissions of toxic air contaminants (TACs) from existing facilities do not pose an unacceptable health risk to people living and working nearby. The rule would use the most up-to-date assumptions about the risk of compounds and would require affected facilities to take action to reduce risk to a low level.

Rule 12-16 would limit the emissions of climate pollutants: greenhouse gases (GHGs); and three criteria pollutants: particulate matter (PM), oxides of nitrogen (NOx), and sulfur dioxide (SO_2) from the five Bay Area petroleum refineries and three associated facilities. The rule would establish facility-wide emissions limits for the covered pollutants at each of the affected facilities to ensure there is no emissions increase due to changes in operation, crude or product slates, or increases in production.

Lead Agency:
Bay Area Air Quality Management District

Initial Study and all Supporting Documentation are Available at:

BAAQMD Headquarters 375 Beale Street, Suite 600 San Francisco, CA 94105	Or by Calling: (415) 749-4763

Attn: Jocelyn Orpia (jorpia@baaqmd.gov) at (415) 749-4763
Or by accessing: http://www.baaqmd.gov/rules-and-compliance/rule-development/regulatory-workshops

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Scheduled Scoping Meeting Dates:

Air District Headquarters Yerba Buena Room 375 Beale Street San Francisco, California November 14, 2016 at 2:00 p.m.	Martinez City Hall 525 Henrietta Street Martinez, California November 16, 2016 at 2:00 p.m

The Notice of Preparation is provided through the following:

☑ Office of Planning & Research, State Clearinghouse
☑ Newspaper
☑ Interested Parties
☑ BAAQMD Website
☑ BAAQMD Mailing List

Review Period:
October 14, 2016 through December 2, 2016

Contact Person:	**Phone Number:**	**E-Mail Address**
Victor Douglas	(415) 749-4752	vdouglas@baaqmd.gov

BAY AREA AIR QUALITY MANAGEMENT DISTRICT

Initial Study for

Regulation 11, Rule 18: Reduction of Risk from Air Toxic Emissions at Existing Facilities
&
Regulation 12, Rule 16: Petroleum Refining Facility-Wide Emissions Limits

Prepared by:

Staff of the Bay Area Air Quality Management District
375 Beale Street, Suite 600
San Francisco, California 94105

Contact: Victor Douglas
415-749-4752

October 2016

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Table of Contents

PROJECT DESCRIPTION

1.0 PROJECT DESCRIPTION

1.1 INTRODUCTION

Petroleum refineries are significant sources of harmful pollutants on both the global (greenhouse gases) and local scale (toxic air contaminants and criteria pollutants). Many Bay Area residents have expressed concern about the impact of this pollution on the environment and public health, particularly those that may disproportionately impact communities near refineries. Though refinery emissions have declined over time, it is possible that as refinery operations change in the future, emissions of these pollutants could increase.

In response to these concerns, the Board of Directors of the Bay Area Air Quality Management District (Air District) has directed staff to bring forward two rules for their consideration, one that reflects policy recommended by some environmental advocacy organizations, and an approach recommended by Air District staff.

Communities for a Better Environment (CBE) and several associated organizations (CBE) have recommended that the Air District adopt new Regulation 12, Rule 16: Petroleum Refining Facility-Wide Emissions Limits (Rule 12-16 or "Refining Caps Rule"). This rule would set numeric limits on specific refinery emissions. Rule 12-16 would apply only to the Bay Area's five petroleum refineries and three facilities associated with the refineries.

The staff of the Air District has developed a different approach that directly addresses concerns about health risks to communities exposed to air pollution. The staff recommendation is that the Air District adopt a new Regulation 11, Rule 18: Reduction of Risk from Air Toxic Emissions at Existing Facilities (Rule 11-18 or "Toxic Risk Reduction Rule"). Rule 11-18 would apply to all facilities whose emissions of toxic air contaminants may result in a significant risk to nearby residents and workers – this would include petroleum refineries. The purpose of Rule 11-18 is to reduce the public's exposure to health risks associated with the emissions of toxic air contaminants (TACs) from stationary sources by reducing those risks to the lowest feasible levels

Because the Board of Directors of the Air District intends to consider these rules within the same timeframe, staff is preparing one Environmental Impact Report (EIR) to cover both rules. The intent of the single EIR is to ensure that all of the potential environmental impacts for both rules are considered and comprehensively addressed. Although they are being considered at the same time and both would affect refineries, the two rules are functionally independent. Adoption of one does not depend on adoption of the other. The Board of Directors could adopt either rule, both rules or neither rule.

1.1.1 Rule 12-16 – Refinery Emissions Caps Rule

Rule 12-16 reflects a policy recommendation from CBE and their associated organizations (henceforth called "CBE"). The rule, as proposed by CBE, would limit the emissions of climate pollutants and three criteria pollutants: greenhouse gases (GHGs), particulate matter (PM), oxides of nitrogen (NOx), and sulfur dioxide (SO_2) from petroleum refineries and three associated facilities. The rule would establish facility-wide emissions limits for the covered pollutants at each of the affected facilities to ensure that each facility does not increase emissions due to changes in operation, crude or product slates, or increases in production. Each facility emissions limit would be set at the maximum-annual emissions reported for that facility in the period from 2011 through 2015[1] with an additional allowance or "threshold factor" of seven percent over the maximum annual emission rate for each pollutant.

1.1.2 Rule 11-18 – Toxic Risk Reduction Rule

Rule 11-18, as drafted by Air District staff, would ensure that emissions of toxic air contaminants (TACs) from existing facilities do not pose an unacceptable health risk to people living and working nearby. The rule would use the most up-to-date assumptions about the risk of compounds and would require the facility to take action to reduce risk below a specified risk threshold, if the facility exceeds the risk thresholds. If the facility could not devise a means to reduce the risk below the specified risk level, the facility would be required to install best available retrofit control technology for toxic pollutants (TBARCT) on every significant source of TAC emissions at the facility.

1.2 AGENCY AUTHORITY

The California Environmental Quality Act (CEQA), Public Resources Code §21000 et seq., requires that the environmental impacts of proposed projects be evaluated and that feasible methods to reduce, avoid or eliminate significant adverse impacts of these projects be identified and implemented. To fulfill the purpose and intent of CEQA, the Air District is the lead agency for Regulation 12, Rule 16 and Regulation 11, Rule 18 and has prepared this Notice of Preparation (NOP) of an Environmental Impact Report (EIR) and Initial Study (NOP/IS) to address the potential environmental impacts associated with the rules.

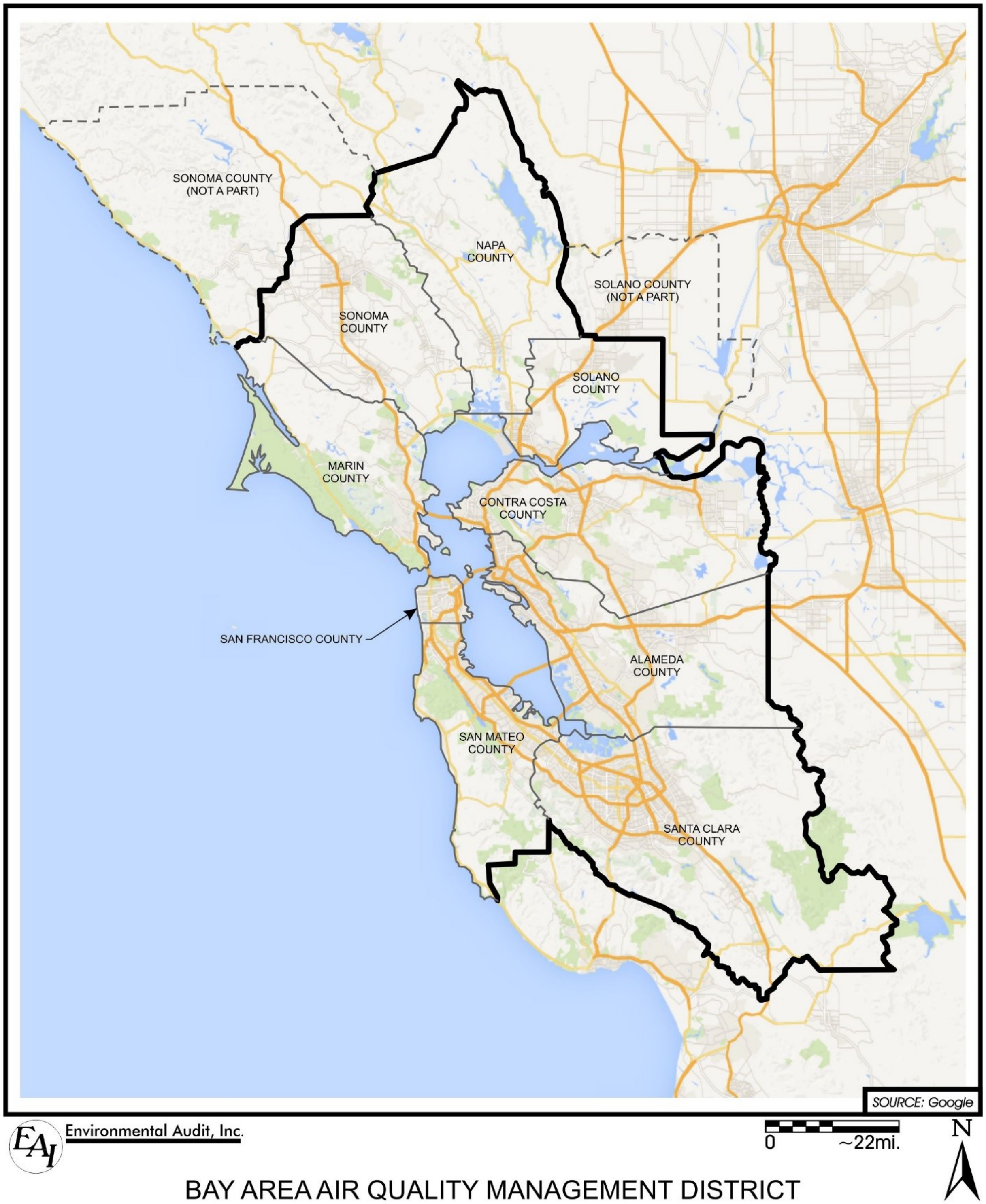
1.3 PROJECT LOCATION

The Air District has jurisdiction over an area encompassing 5,600 square miles. The Air District includes all of Alameda, Contra Costa, Marin, San Francisco, San Mateo, Santa Clara, and Napa Counties, and portions of southwestern Solano and southern Sonoma counties. The San Francisco Bay Area is characterized by a large, shallow basin surrounded by coastal mountain ranges tapering into sheltered inland valleys. The combined climatic and topographic factors result in increased potential for the accumulation of air pollutants in the inland valleys and reduced potential for buildup of air pollutants along the coast. The Basin is bounded by the Pacific Ocean to the west and includes complex terrain consisting of coastal mountain ranges, inland valleys and bays (see Figure 1-1).

[1] GHG emissions are based on the 2011-2014 time period, since 2015 data is not available from the Air Resources Board yet.

Figure 1-1

Geographic Jurisdictional Boundaries of the Bay Area Air Quality Management District



1.4 BACKGROUND

Rule 12-16 would affect the five petroleum refineries currently located in the Bay Area within the jurisdiction of the Air District:

- Chevron Products Company (Richmond),
- Phillips 66 Company – San Francisco Refinery (Rodeo),
- Shell Martinez Refinery (Martinez),
- Tesoro Refining and Marketing Company (Martinez), and
- Valero Refining Company – California (Benicia).

The rule would also affect three refinery-related facilities:

- Air Liquide (Richmond),
- Air Products (Martinez), and
- Martinez Cogen LP (Martinez).

Rule 11-18 would affect hundreds of facilities that emit TACs. The Air District has determined that these toxic emissions need to be reduced in order to be more protective of public health. These facilities include data centers, petroleum refineries, a cement kiln, gasoline dispensing facilities, etc., and emit a variety of TACs that can adversely impact public health. TACs include compounds such as diesel particulate matter (DPM), benzene, polycyclic aromatic hydrocarbons (PAHs), and 1,3-butadiene.

The primary focus of CBE's concern has been petroleum refineries. 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).

Air pollutants are categorized based on their properties, and the programs under which they are regulated. Air pollutants include: (1) criteria pollutants, (2) toxic pollutants (or TACs), and (3) climate pollutants (or GHGs). Additional categories of air contaminants include odorous compounds and visible emissions.

Criteria pollutants are emissions for which Ambient Air Quality Standards (AAQS) have been set and include: (1) carbon monoxide (CO), (2) nitrogen dioxide (NO_2) and NO_X, (3) PM in two size ranges – aerodynamic diameter of 10 micrometers or less (PM_{10}), and aerodynamic diameter of 2.5 micrometers or less ($PM_{2.5}$), (4) volatile organic compounds (VOC), and (5) sulfur dioxide (SO_2). Other compounds, specifically volatile organic compounds (VOC), can react in the atmosphere to form ozone and are often regulated along with criteria pollutants. These compounds can have both localized and regional impacts. Each of these criteria pollutants are emitted by petroleum refineries, as well as numerous other stationary sources and mobile sources (automobiles, trucks, locomotive engines, marine vessels, construction equipment, etc.).

TACs are emissions for which AAQS have generally not been established, but may result in human health risks. The state list of TACs currently includes approximately 190 separate chemical compounds and groups of compounds. These compounds tend to have more localized impacts. There are many TACs potentially emitted from industrial sources, including refineries.

GHGs are emissions that include carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), and three groups of fluorinated compounds (i.e., hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and sulfur hexafluoride (SF_6)), and are the major anthropogenic GHGs. These compounds are global in nature and require a global reduction to a beneficial benefit on the global climate. GHGs emitted from petroleum refineries include CO_2, CH_4 and N_2O.

The regulatory approaches for Rules 11-18 and 12-16 are summarized below and include the following basic elements.

Regulation 11, Rule 18

- The Air District would screen all facilities that report toxic emissions. From this screening, the Air District would determine each facility's priority score (PS). The Air District would conduct health risk assessments (HRA) for facilities with a cancer risk prioritization score of 10 or greater or a non-cancer prioritization score of 1.0 or greater. The HRAs would incorporate the new Office of Environmental Health Hazard Assessment (OEHHA) protocol and health risk values adopted in March 2015, the Risk Management Guidelines adopted in July 2015 by the California Air Resources Board (ARB) and the California Air Pollution Control Officers Association (CAPCOA) and revised Air District HRA guidelines. The Air District will prioritize the development of the HRAs according to priority score and then according to type of facility. This is described in more detail later in this document.
- Facilities that pose a cancer risk in excess of 10 per million or a chronic or acute hazard index in excess of 1.0 must either:
  - Reduce the facility cancer risk below 10/M and reduce the chronic and acute hazard indices below 1.0; or
  - Install TBARCT on all significant sources of toxic emissions.

Regulation 12, Rule 16

- Would apply to each of the Bay Area petroleum refineries and three support facilities.
- Would establish facility-wide emissions limits for GHGs, $PM_{2.5}$ and PM_{10}, NOx, and SO_2 at each of the affected facilities based on the following method:
  - Each facility emissions limit would be set at the maximum-annual emissions reported for that facility in the period from 2011 through 2015,[2] and
  - Include an additional allowance or "threshold factor" that would equal seven percent over the maximum for GHGs, $PM_{2.5}$ and PM_{10}, NOx, and SO_2.
- Emissions from start-up, shut-down, maintenance and malfunction would be subject to the cap.
- Compliance with the emissions limits would be based on comparing the annual emissions inventory with the facility-wide emissions limit for each covered pollutant. Any annual emissions inventory that exceeds the established pollutant emissions limit for the affected facility would be a violation of the rule.

[2] Except GHGs, which are based on 2011 through 2014 emissions due to the current unavailability of 2015 data.

1.5 PROJECT DESCRIPTION

The description of Regulation 11, Rule 18 and Regulation 12, Rule 16 are provided below.

1.5.1 REGULATION 11, RULE 18

The rule would require facilities that pose a site-wide health risk in excess of the risk action level threshold of ten per million (10/M) cancer risk or 1.0 hazard index for both chronic and acute risk to reduce that risk below the threshold through the implementation of a risk reduction plan approved by the Air District or demonstrate that all significant sources of toxic emissions are controlled TBARCT; a significant source of toxic emission is one that poses a health risk of 1.0/M cancer or 0.2 hazard index. The rule would be implemented in four phases based on either a facility's priority score (PS) or the toxic emissions source.

1.5.1.1 Objectives

The objectives of Toxic Risk Reduction Rule are to:

1) Reduce the public's exposure to health risks associated with the emissions of TACs from stationary sources;
2) Incorporate the most up-to-date health risk methodologies and health values into the Air District's risk evaluation process for existing stationary sources of TACs;
3) Ensure the facilities that impact the most sensitive and overburdened communities reduce their associated health risk in an efficient and expeditious manner;
4) Provide the public opportunity to comment on the draft HRAs to provide transparency and clarity to the process; and
5) Provide the public opportunity to comment on risk reduction plans as they are drafted by the affected facilities.

1.5.1.2 Administrative Procedures

The Toxic Risk Reduction Rule would utilize the annual toxic emissions inventories reported to the Air District by sources that emit toxic compounds. From the toxic emissions inventory data, Air District[3] would conduct a site-specific Health Risk Screening Analysis (HRSA). The HRSA assesses the potential for adverse health effects from public exposure to routine and predictable emissions of TACs. Procedures used for completing HRSAs are based on guidelines adopted by CARB/CAPCOA. From these HRSAs, the Air District would determine each facility's priority score (PS). The facility PS or the toxic emissions source type would be used to determine which phase a facility would be placed. In establishing the priority level for a facility, the Air District would consider:

(1) The amount of toxic pollutants emitted from the facility;
(2) The toxicity of these materials;
(3) The proximity of the facility to potential receptors; and
(4) Any other factors that the Air District deems to be important.

[3] In order to complete the analyses in a timely manner. Some of the work may be completed by independent contractors working for the Air District under direction of Air District staff.

The rule would be implemented in four phases based on either a facility's PS or the toxic emissions source type as illustrated in Table 1.1. (Priority scores for all potentially affected facilities are expected to be completed by the end of 2017).

Table 1.1
Implementation Phases

Phase	Criterion	HRAs	Risk Reduction Plans	Plan Implementation
1	Cancer PS > 250 or Non-cancer PS >2.5	2017 – 2018	2018 – 2019	2019 – 2022
2	Cancer PS > 10 or Non-cancer PS >1.0	2019 – 2021	2021 – 2022	2022 – 2025
3	Diesel IC Engines	2021 – 2023	2023 – 2024	2024 – 2027
4	Retail Gas Stations	2023 – 2024	2024 – 2025	2025 – 2028

The Air District would conduct HRAs for facilities in accordance with the OEHHA HRA Guidelines and the CARB/CAPCOA Risk Management Guidelines that were updated in 2015. These Guidelines were updated pursuant to the Children's Environmental Health Protection Act (Senate Bill 25), which required that OEHHA develop health risk assessment procedures that ensure infants and children are protected from the harmful effects of air pollution. Using the results of the HRAs, the Air District would determine whether a facility would be affected by Rule 11-18. The rule would affect facilities with health risk impacts that exceeded any of the risk action level thresholds of ten per million (10/M) cancer risk or 1.0 hazard index for both chronic and acute risk. The Air District would notify facilities of their health risk score. A facility with a risk action level exceeding the threshold(s) will be required to reduce the risk below the threshold(s) by implementing a risk reduction plan within three years of plan approval, or demonstrate that all significant sources of toxic emissions are controlled by TBARCT within the same three-year period; a significant source of toxic emission is one that poses a health risk of 1.0/M cancer or 0.2 hazard index.

1.5.1.3 Health Risk Assessments

The Air District uses a variety of tools to determine where air quality health impacts may be occurring in the Bay Area, to assess the relative magnitude of these health impacts compared to other locations, and to determine how to best focus Air District resources in order to reduce these health impacts. HRAs are one of the tools that can be used to assess the relative magnitude of health hazards. HRAs are designed to quantify the potential health impacts that people and communities may be experiencing due to specific sources or facilities or that may occur in the future due to proposed projects or proposed changes at a facility. An HRA consists of four basic steps: 1) hazard identification; 2) exposure assessment; 3) dose response assessment; and 4) risk characterization. The Air District conducts HRAs using standardized methodologies for each of these steps. The Air District HRAs would be prepared in accordance with the most recent guidelines adopted by OEHHA in March 2015.

Air District staff believes that new facility-wide HRAs should be performed including improved emission inventories, updated health effects values, and the most recent HRA methodologies. rule 11-18 would require that the Air District conduct HRAs utilizing the most recent OEHHA HRA Guidelines along with more refined emissions inventories.

1.5.1.4 Pollutant Coverage

The Toxic Risk Reduction Rule would address TAC emissions from existing stationary sources. TAC emissions from new and modified sources are addressed under Air District Regulation 2, Rule 5. The California Health and Safety Code section 39655 defines a TAC as “an air pollutant which may cause or contribute to an increase in mortality or in serious illness, or which may pose a present or potential hazard to human health. A substance that is listed as a hazardous air pollutant pursuant to subsection (b) of Section 112 of the federal act (42 U.S.C. Sec. 7412(b)) is a toxic air contaminant.” For the purposes of this rule, TACs consists of the substances listed in Air District Regulation 2, Rule 5: New Source Review of Toxic Air Contaminants, Table 2-5-1.

Some of the key pollutants to be addressed under the Toxic Risk Reduction Rule include the following:

Benzene: Benzene is highly carcinogenic and occurs throughout the Bay Area. Most of the benzene emitted in the Bay Area comes from motor vehicles, including evaporative leakage and unburned fuel exhaust. Stationary sources contribute 13 percent of the benzene statewide. The primary stationary sources of benzene emissions include gasoline stations, petroleum refining, electricity generation, and cement production.

1,3-Butadiene: 1,3-butadiene is another carcinogen, with similar origins to benzene, namely mainly from gasoline evaporation and motor vehicle exhaust, biomass burning, petroleum refining and electricity generation.

Polycyclic aromatic hydrocarbons (PAHs): PAHs are a set of hydrocarbons formed of multiple benzene rings. Several PAHs have been shown to be carcinogenic, the best-studied of which is Benzo(a)pyrene. Although PAHs are emitted during petroleum refining, in the Bay Area the vast majority derive from fossil fuel and wood combustion.

Diesel Particulate Matter (DPM): DPM is the primary source of ambient risk based on risk analysis, followed by benzene and 1,3-butadiene. DPM emissions sources mainly include mobile sources, such as heavy-duty trucks, buses, construction equipment, locomotives, and ships, but also stationary sources such as stationary diesel engines and backup generators.

1.5.1.5 Source Coverage

The Toxic Risk Reduction Rule would apply to all sources of TAC emissions from “stationary sources” in the Bay Area. Stationary sources, as opposed to mobile sources such as trucks and other vehicles, are the sources over which the Air District has regulatory jurisdiction.

The Toxic Risk Reduction Rule would apply to a wide variety of sources and facilities located throughout the Bay Area, including data centers, petroleum refineries, chemical plants, waste water treatment facilities, foundries, forges, landfill operations, hospitals, crematoria, gasoline dispensing facilities (GDF) (i.e., gasoline stations), colleges and universities, military facilities and installations and airline operations. The Air District estimates that hundreds of facilities could be impacted by this rule.

1.5.2 REGULATION 12, RULE 16

1.5.2.1 Objectives

The objectives of the Refining Emission Caps are to:

1) Protect air quality, public health, and the climate from increases in annual facility-wide mass emissions of GHGs, PM, NOx, and SOx caused by changes in refinery oil feed quality or quantity, refinery or support equipment or operation, or combinations of these causes, by preventing any significant increase in these emissions;
2) Protect the climate and public health by preventing any significant increase in these emissions at refineries and associated facilities from increasing the emission intensity of the production of transportation fuels;
3) Protect community and public health by preventing any significant increase in these emissions from worsening hazards for which HRA methods may not account, including but not limited to acute and chronic ambient PM, NOx, SOx, and PM exposure hazards;
4) Complement other air quality, public health, and climate measures by discouraging investment in new refinery equipment that would lead to increased emissions of GHG, PM, NOx, or SOx from Bay Area refineries.

1.5.2.2 Pollutant Coverage

The Refining Cap Rule would limit the emissions of climate pollutants (GHGs) and three criteria pollutants (PM – both PM_{10} and $PM_{2.5}$, NOx, and SO_2) from refineries and other refining related facilities to a specific baseline plus an allowance; thereby establishing a "cap" for each of these emissions that the facility could not exceed.

Greenhouse Gases (GHGs): GHGs refer to gases that contribute to global warming. In addition to negative impacts on air quality as higher temperatures contribute to increased levels of ozone and PM, climate change may cause a wide range of ecological, social, economic, and demographic impacts. GHGs include carbon dioxide, methane, nitrous oxide, and fluorinated hydrocarbons. CO_2 is released to the atmosphere when fossil fuels (oil, gasoline, diesel, natural gas, and coal), solid waste, and wood or wood products are burned. CH_4 is emitted during the production and transport of coal, natural gas, and oil. Methane emissions also result from the decomposition of organic waste in municipal solid waste landfills and the raising of livestock. N_2O is emitted during agricultural and industrial activities, as well as during combustion of solid waste and fossil fuels. Fluorinated hydrocarbons: HFCs, PFCs, and SF_6, are generated in a variety of industrial processes. Although these gases are small in terms of their absolute mass, they are potent agents of climate change as expressed by their global warming potential.

Particulate Matter (PM): PM is a complex pollutant composed of an assortment of tiny airborne particles that vary in size and mass (ultrafine, fine, and coarse), physical state (solid or liquid), chemical composition, toxicity, and how they behave in the atmosphere. These particles originate from a variety of man-made and natural sources, including fossil fuel combustion, residential wood burning and cooking, wildfires, volcanoes, sea salt, and dust. Fine and ultrafine particles are so small, they can bypass the body's natural defenses and penetrate deep into the lungs, bloodstream, brain and other vital organs, and individual cells. Health studies have shown that exposure to PM can have a wide range of negative health effects, including triggering asthma attacks, chronic bronchitis, impaired lung development in children, heart attack, stroke, and premature death. Residential wood burning is the largest source of PM in the Bay Area during winter days. On an annual basis, mobile sources such as cars, trucks, ships and trains are the largest source of PM in the Bay Area.

Nitrogen Oxides (NOx): Nitrogen oxides are a group of gases that form when nitrogen reacts with oxygen during combustion, especially at high temperatures. These compounds (including nitric oxide and nitrogen dioxide), can contribute significantly to air pollution, especially in cities and areas with high motor vehicle traffic. In the Bay Area, nitrogen dioxide appears as a brown haze. At higher concentrations, nitrogen dioxide can damage sensitive crops, such as beans and tomatoes, and aggravate respiratory problems.

Sulfur Oxides (SOx): Heating and burning fossil fuels (such as coal and oil) release the sulfur present in these materials. In areas where large quantities of fossil fuels are used, sulfur oxides can be a major air pollution problem. The most common kind of sulfur oxide is SO_2. This substance can react with oxygen to form sulfur trioxide, which can form sulfuric acid mist in the presence of moisture. These contaminants can damage vegetation and negatively impact the health of both humans and animals.

1.5.2.3 Affected Facilities

The Refining Caps Rule would apply to each of the Bay Area's five petroleum refineries and to three additional support facilities. The five refineries are Chevron Refinery in Richmond, Shell Refinery in Martinez, Phillips 66 Refinery in Rodeo, Tesoro Refinery in Martinez, and Valero Refinery in Benicia. The three affected support facilities are Air Liquide in Richmond, Air Products in Martinez, and Martinez Cogen LP in Martinez.

1.5.2.4 The Emissions Limits

The draft emissions limit for each covered pollutant and each affected facility are shown in Table 1.2. A numeric limit on the annual mass emission rate of each air pollutant specified would be applied to each facility specified in the table. The limit is equal to the maximum-year actual emissions reported in 2011–2015[4] plus the additional allowance, or threshold factor, of seven percent that is intended to account for normal year-to-year variations in emissions.

[4] Except GHGs, which are based on 2011 through 2014 emissions due to the current unavailability of 2015 data.

Table 1.2
The Enforceable Emissions Limits on Refinery-Wide Emissions [a]

Facility Name & Number	Pollutants				
	GHG[b] (thousands of metric tons)	**$PM_{2.5}$**[c] (tons)	**PM_{10}**[c] (tons)	**NOx**[c] (tons)	**SO_2**[c] (tons)
Chevron[d]: A-0010	4,774	502	526	971	394
Shell: A-0011	4,560	495	589	1,068	1,455
Phillips 66: A-0016	1,608	75	83	334	443
Tesoro: B-2758 / B-2759	2,615	77.7	97	1,015	644
Valero: B-2626 / B-3193	3,145	133	133	1,300	69.6
Martinez Cogen LP: A-1820	451	18.8	18.8	119	2.3
Air Liquide: B-7419	947	16.1	17.3	13.8	2.5
Air Products: B-0295	290	9.7	10.4	3.4	2.3

a. Annual facility-wide emission limits.
b. GHG: greenhouse gas emissions (CO_2e) as reported under Air Resources Board Mandatory Reporting. PM: filterable and condensable particulate matter.
c. $PM_{2.5}$ (“fine” particulate matter), PM_{10} (“respirable” particulate matter), NOx: oxides of nitrogen; SO_2: sulfur dioxide as reported in the Facility’s annual emission inventory.
d. Facility owners or operators, as of August 2016, shown for information and context.

1.5.2.5 Changes in Monitoring Methods

CBE intends that these limits would change if the quantity of reported emissions changed solely due to a change in the method of monitoring or estimating emissions. Air District staff will work with CBE to capture this intent either in the rule language or in the plan for implementing the rule.

Chapter 2

Environmental Checklist

INTRODUCTION

The environmental checklist provides a standard evaluation tool to identify a project's adverse environmental impacts. This checklist identifies and evaluates potential adverse environmental impacts that may be created by the proposed project.

GENERAL INFORMATION

Project Title:	Regulation 11, Rule 18: Reduction of Risk from Air Toxic Emissions at Existing Facilities and Regulation 12, Rule 16: Petroleum Refining Facility-Wide Emissions Limits
Lead Agency Name and Address:	Bay Area Air Quality Management District 375 Beale Street, Suite 600 San Francisco, California 94105
Contact Person:	Victor Douglas
Contact Phone Number:	415-749-4752
Project Location:	The rules would apply to a multitude of facilities within the jurisdiction of the Bay Area Air Quality Management District, which encompasses all of Alameda, Contra Costa, Marin, San Francisco, San Mateo, Santa Clara, and Napa Counties and portions of southwestern Solano and southern Sonoma Counties.
Project Sponsor's Name and Address:	Bay Area Air Quality Management District 375 Beale Street, Suite 600 San Francisco, California 94105
General Plan Designation:	Rule 11-18 would apply to facilities that emit toxic pollutants and Rule 12-16 would affect the five petroleum refineries and three refinery-related facilities currently located in the Bay Area within the jurisdiction of the Air District: • Chevron Products Company (Richmond), • Phillips 66 Company – San Francisco Refinery (Rodeo), • Shell Martinez Refinery (Martinez), • Tesoro Refining and Marketing Company (Martinez), and • Valero Refining Company – California (Benicia). Rule 12-16 would also affect: • Air Liquide (Richmond), • Air Products (Martinez), and • Martinez Cogen LP (Martinez).
Zoning:	See “General Plan Designation” above
Description of Project:	See “Background” in Chapter 1.
Surrounding Land Uses and Setting:	See “Affected Area” in Chapter 1.
Other Public Agencies Whose Approval Is Required:	None

ENVIRONMENTAL FACTORS POTENTIALLY AFFECTED:

The following environmental impact areas have been assessed to determine their potential to be affected by the proposed project. As indicated by the checklist on the following pages, environmental topics marked with an "☑" may be adversely affected by the proposed project. An explanation relative to the determination of impacts can be found following the checklist for each area.

	Rule 11-18	Rule 12-16		Rule 11-18	Rule 12-16		Rule 11-18	Rule 12-16
Aesthetics	☐	☐	Agriculture and Forestry Resources	☐	☐	Air Quality	☑	☑
Biological Resources	☐	☐	Cultural Resources	☐	☐	Geology / Soils	☐	☐
Greenhouse Gas Emissions	☑	☑	Hazards & Hazardous Materials	☐	☑	Hydrology / Water Quality	☐	☑
Land Use / Planning	☐	☐	Mineral Resources	☐	☐	Noise	☐	☐
Population / Housing	☐	☐	Public Services	☐	☐	Recreation	☐	☐
Transportation / Traffic	☐	☐	Utilities / Service Systems	☐	☑	Mandatory Findings of Significance	☑	☑

DETERMINATION

On the basis of this initial evaluation:

☐ I find the proposed project COULD NOT have a significant effect on the environment, and that a NEGATIVE DECLARATION will be prepared.

☐ I find that although the proposed project could have a significant effect on the environment, there will not be significant effects in this case because revisions in the project have been made by or agreed to by the project proponent. A MITIGATED NEGATIVE DECLARATION will be prepared.

☑ I find that the proposed project MAY have a significant effect on the environment, and an ENVIRONMENTAL IMPACT REPORT is required.

☐ I find that the proposed project MAY have a "potentially significant impact" or “potentially significant unless mitigated” impact on the environment, but at least one effect 1) has been adequately analyzed in an earlier document pursuant to applicable legal standards, and 2) has been addressed by mitigation measures based on the earlier analysis as described on attached sheets. An ENVIRONMENTAL IMPACT REPORT is required, but it must analyze only the effects that remain to be addressed.

☐ I find that although the proposed project could have a significant effect on the environment, because all potentially significant effects (a) have been analyzed adequately in an earlier EIR or NEGATIVE DECLARATION pursuant to applicable standards, and (b) have been avoided or mitigated pursuant to that earlier EIR or NEGATIVE DECLARATION, including revisions or mitigation measures that are imposed upon the proposed project, nothing further is required.

Signature: Date:

Printed Name: Date:

EVALUATION OF ENVIRONMENTAL IMPACTS:

1) A brief explanation is required for all answers except "No Impact" answers that are adequately supported by the information sources a lead agency cites in the parentheses following each question. A "No Impact" answer is adequately supported if the referenced information sources show that the impact simply does not apply to projects like the one involved (e.g., the project falls outside a fault rupture zone). A "No Impact" answer should be explained where it is based on project-specific factors as well as general standards (e.g., the project will not expose sensitive receptors to pollutants, based on a project-specific screening analysis.

2) All answers must take account of the whole action involved, including off-site as well as on-site, cumulative as well as project-level, indirect as well as direct, and construction as well as operational impacts.

3) Once the lead agency has determined that a particular physical impact may occur, the checklist answers must indicate whether the impact is potentially significant, less than significant with mitigation, or less than significant. "Potentially Significant Impact" is appropriate if there is substantial evidence that an effect may be significant. If there are one or more "Potentially Significant Impact" entries when the determination is made, an EIR is required.

4) "Negative Declaration: Less Than Significant with Mitigation Incorporated" applies where the incorporation of mitigation measures has reduced an effect from "Potentially Significant Impact" to a "Less Than Significant Impact." The lead agency must describe the mitigation measures, and briefly explain how they reduce the effect to a less than significant level (mitigation measures from "Earlier Analyses," as described in (5) below, may be cross-referenced).

5) Earlier analyses may be used where, pursuant to the tiering, Program EIR, or other CEQA process, an effect has been adequately analyzed in an earlier EIR or negative declaration. Section 15063 (c)(3)(D). In this case, a brief discussion should identify the following:

   a) Earlier Analysis Used. Identify and state where they are available for review.

   b) Impacts Adequately Addressed. Identify which effects from the above checklist were within the scope of and adequately analyzed in an earlier document pursuant to applicable legal standards, and state whether such effects were addressed by mitigation measures based on the earlier analysis.

   c) Mitigation Measures. For effects that are "Less than Significant with Mitigation Measures Incorporated," describe the mitigation measures which were incorporated or refined from the earlier document and the extent to which they address site-specific conditions for the project.

6) Lead agencies are encouraged to incorporate into the checklist references to information sources for potential impacts (e.g., general plans, zoning ordinances). Reference to a previously prepared or outside document should, where appropriate, include a reference to the page or pages where the statement is substantiated.

7) Supporting Information Sources: A source list should be attached, and other sources used or individuals contacted should be cited in the discussion.

8) This checklist is only a suggested form, and lead agencies are free to use different formats; however, lead agencies should normally address the questions from this checklist that are relevant to a project's environmental effects in whatever format is selected.

9) The explanation of each issue should identify:

   a) the significance criteria or threshold, if any, used to evaluate each question; and

   b) the mitigation measure identified, if any, to reduce the impact to less than significance.

ENVIRONMENTAL CHECKLIST AND DISCUSSION

I. AESTHETICS.

Would the project:	Potentially Significant Impact	Less Than Significant Impact with Mitigation Incorporated	Less-than-Significant Impact	No Impact
a) Have a substantial adverse effect on a scenic vista?				
Rule 11-18	☐	☐	☐	☑
Rule 12-16	☐	☐	☐	☑
b) Substantially damage to scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings along a scenic highway?				
Rule 11-18	☐	☐	☐	☑
Rule 12-16	☐	☐	☐	☑
c) Substantially degrade the existing visual character or quality of the site and its surroundings				
Rule 11-18	☐	☐	☑	☐
Rule 12-16	☐	☐	☑	☐
d) Create a new source of substantial light or glare that would adversely affect daytime or nighttime views in the area?				
Rule 11-18	☐	☐	☑	☐
Rule 12-16	☐	☐	☑	☐

Setting

The Air District covers all of Alameda, Contra Costa, Marin, San Francisco, San Mateo, Santa Clara, and Napa Counties and portions of southwestern Solano and southern Sonoma Counties. The area of coverage is vast (about 5,600 square miles), so that land uses vary greatly and include commercial, industrial, residential, agricultural, and open space uses. Rule 11-18 would affect hundreds of facilities that cover a wide variety of industries and operations that emit toxic pollutants located throughout the Air District, including data centers, petroleum refineries, a cement kiln, gasoline dispensing facilities, hospitals, crematoria, etc. The rule would require affected facilities to reduce the health risk they pose using various risk reduction measure and controls. Rule 12-16 would affect the four petroleum refineries that are located in Contra Costa County and one that is located in Solano County (Valero) and also three refinery-related facilities located in Contra Costa County, all of which are in areas designated for industrial facilities.

The methods of control expected to be used to comply with Rule 11-18 are not expected to result in any aesthetic alterations of the facilities. Refineries and other facilities affected by Rule 12-16 are generally located in industrial areas and compliance is not expected to result in any aesthetic changes to the facilities. Scenic highways or corridors are generally not located in the vicinity of these facilities.

Regulatory Background

Visual resources are generally protected by the City and/or County General Plans through land use and zoning requirements.

Discussion of Impacts

I. a, b, and c).

Rule 11-18: Rule 11-18 would require facilities whose health risk is determined to exceed a specific action level to either reduce the facility risk below the action level or to install best available retrofit control technology on all significant sources of risk. Some control options include stack modifications. Stack modifications are another common and generally inexpensive risk reduction measure that are often used to reduce risk from back-up generators and soil remediation operations. Changing the direction of a stack (from horizontal to vertical, for example) and increasing the height of a stack to just above the height of nearby buildings will increase the dispersion of the emissions from that stack and will typically result in lower ground level air concentrations at nearby receptors and lower health risks. Stack modifications may change the existing visual character or quality of a facility but are not expected to have significant adverse aesthetic impacts to the surrounding community as they would be expected to occur in industrial or commercial areas. Regulation 11-18 could also result in the installation of new air pollution control equipment to mitigate TAC emissions. While these control devices may be visible to surrounding areas, they would be installed within existing industrial or commercial areas, would be subject to local height limits, and are not expected to block any scenic vista, degrade the visual character or quality of the area, or result in significant adverse aesthetic impacts.

Rule 12-16: Rule 12-16 would limit air emissions of GHGs and certain criteria pollutants ($PM_{2.5}$, PM_{10}, NOx, and SO_2) from Bay Area petroleum refineries and three refinery-related facilities to the historic highest emission rate over a recent multi-year period, with an additional seven-percent margin to account for operational variations. Rule 12-16 is not expected to require the construction of any substantial new structures that would impact the views of the refineries or areas outside of existing refinery boundaries, provided existing crude and product slates remain relatively constant. However, because crude and product slates vary over time and these changes may result in changes in the emissions profile of a refinery, there is the potential that Rule 12-16 could result in the need for better controls on various refinery sources, (e.g. boilers and heaters) to mitigate any potential emissions increase. These emission controls could lead to changes in operations or installation of new air pollution control devices. While these control devices may be visible to surrounding areas, they would be installed within existing industrialized areas and are not expected to be taller than existing refinery structures. Any new equipment would be located within the refineries, would be compatible with the urban/developed nature of the refineries, are not expected to block any scenic vista, degrade the visual character or quality of the area, or result in any adverse aesthetic impacts. Once implemented, equipment associated with the rule is not expected to be noticeably visible within the refineries. Therefore, the rule is not expected to have adverse aesthetic impacts to the surrounding community.

I. d).

Rule 11-18: The facilities affected by Rule 11-18, including petroleum refineries, may need to install or modify air pollution control equipment or modify operations as to implement risk reduction measures. However, it is unlikely that any of the changes would result in additional night-time operation that would require extra lighting. New light sources, if any, are not expected to be noticeable in residential areas. Most local land use agencies have ordinances that limit the intensity of lighting and its effects on adjacent property owners. Therefore, the rule is not expected to have significant adverse aesthetic impacts to the surrounding community.

Rule 12-16: The facilities affected by the Regulation 12-16 may be required to install additional air pollution control equipment or modify operations. Further, refinery modifications could require additional lighting. However, refineries are already lighted for night-time operations and safety measures, and are located in appropriately zoned areas that are not usually located next to residential areas. New light sources, if any, are not expected to be noticeable in residential areas. Most local land use agencies have ordinances that limit the intensity of lighting and its effects on adjacent property owners. Therefore, the rule is not expected to have significant adverse aesthetic impacts to the surrounding community.

Conclusions

Based upon the above considerations, significant adverse project-specific impacts to aesthetics are not expected to occur due to implementation of either Rule 11-18 or Rule 12-16 and, therefore, will not be further evaluated in the Draft EIR.

II. AGRICULTURE AND FORESTRY RESOURCES.

In determining whether impacts on agricultural resources are significant environmental effects, lead agencies may refer to the California Agricultural Land Evaluation and Site Assessment Model (1997) prepared by the California Department of Conservation as an optional model to use in assessing impacts on agriculture and farmland. In determining whether impacts to forest resources, including timberland, are significant environmental effects, lead agencies may refer to information compiled by the California Department of Forestry and Fire Protection regarding the state's inventory of forest land, including the Forest and Range Assessment Project and the Forest Legacy Assessment project; and forest carbon measurement methodology provided in Forest Protocols adopted by the California Air Resources Board.

Would the project:	Potentially Significant Impact	Less Than Significant Impact with Mitigation Incorporated	Less-than-Significant Impact	No Impact
a) Convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland), as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to non-agricultural use?				
Rule 11-18	☐	☐	☐	☑
Rule 12-16	☐	☐	☐	☑
b) Conflict with existing zoning for agricultural use or conflict with a Williamson Act contract?				
Rule 11-18	☐	☐	☐	☑
Rule 12-16	☐	☐	☐	☑
c) Conflict with existing zoning for, or cause rezoning of, forest land as defined in Public Resources Code section 12220(g)), timberland (as defined by Public Resources Code section 4526), or timberland zoned Timberland Production (as defined by Government Code section 51104(g))?				
Rule 11-18	☐	☐	☐	☑
Rule 12-16	☐	☐	☐	☑
d) Result in the loss of forest land or conversion of forest land to non-forest use?				
Rule 11-18	☐	☐	☐	☑
Rule 12-16	☐	☐	☐	☑
e) Involve other changes in the existing environment which, due to their location or nature, could result in conversion of Farmland, to non-agricultural use or conversion of forest land to non-forest use?				
Rule 11-18	☐	☐	☐	☑
Rule 12-16	☐	☐	☐	☑

Setting

The BAAQMD covers all of Alameda, Contra Costa, Marin, San Francisco, San Mateo, Santa Clara, and Napa Counties and portions of southwestern Solano and southern Sonoma Counties. The area of coverage is vast (about 5,600 square miles) so that land uses vary greatly and include commercial, industrial, residential, agricultural, and open space uses. Some of these agricultural lands are under Williamson Act contracts.

Rule 11-18 would affect hundreds of facilities that cover a wide variety of industries and operations that emit toxic pollutants located throughout the Air District, including data centers, petroleum refineries, a cement kiln, gasoline dispensing facilities, hospitals, crematoria, etc. The rule would require affected facilities to reduce the health risk they pose using various risk reduction measure and controls. Rule 12-16 would affect the four petroleum refineries that are located in Contra Costa County and one that is located in Solano County (Valero) and also three refinery-related facilities located in Contra Costa County.

Regulatory Background

Agricultural and forest resources are generally protected by the City and/or County General Plans, Community Plans through land use and zoning requirements, as well as any applicable specific plans, ordinances, local coastal plans, and redevelopment plans.

Discussion of Impacts

II. a, b, c, d, and e).

Rule 11-18: The facilities and operation that would be affected by Rule 11-18 are located primarily in industrial and commercial areas where agricultural or forest resources are generally not located. Some construction activity is expected to result from compliance with Rule 11-18; but such activities are expected to occur on the premises of the affected facilities and, therefore, would not impact agricultural and forestry resources.

Rule 12-16: The affected refineries and refinery-related facilities are located in industrial areas where agricultural or forest resources are generally not located. Rule 12-16 could require air pollution control equipment on various refinery sources or changes in operations at any or all of the Bay Area refineries to ensure compliance with the emissions limits. Construction activities may be associated with compliance with Rule 12-16. Such construction activities are expected to be limited to the existing refineries. No agricultural or forest resources are located within the boundaries of the existing refineries, and construction activities would not convert any agricultural or forest land into non-agricultural or non-forest use, or involve Williamson Act contracts.

Conclusions

Based upon the above considerations, significant adverse project-specific impacts to agriculture and forest resources are not expected to occur due to implementation of either Rule 11-18 or Rule 12-16 and, therefore, will not be further evaluated in the Draft EIR.

III. AIR QUALITY.

Where available, the significance criteria established by the applicable air quality management or air pollution control district may be relied upon to make the following determinations.

Would the project:	Potentially Significant Impact	Less Than Significant Impact with Mitigation Incorporated	Less-than-Significant Impact	No Impact
a) Conflict with or obstruct implementation of the applicable air quality plan?				
Rule 11-18	☐	☐	☐	☑
Rule 12-16	☐	☐	☐	☑
b) Violate any air quality standard or contribute to an existing or projected air quality violation?				
Rule 11-18	☑	☐	☐	☐
Rule 12-16	☑	☐	☐	☐
c) Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is a nonattainment area for an applicable federal or state ambient air quality standard (including releasing emissions that exceed quantitative thresholds for ozone precursors)?				
Rule 11-18	☑	☐	☐	☐
Rule 12-16	☑	☐	☐	☐
d) Expose sensitive receptors to substantial pollutant concentrations?				
Rule 11-18	☑	☐	☐	☐
Rule 12-16	☑	☐	☐	☐
e) Create objectionable odors affecting a substantial number of people?				
Rule 11-18	☐	☐	☐	☑
Rule 12-16	☐	☐	☐	☑

Setting

It is the responsibility of the BAAQMD to ensure that state and federal ambient air quality standards are achieved and maintained in its geographical jurisdiction. Health-based air quality standards have been established by California and the federal government for the following criteria air pollutants: ozone, carbon monoxide (CO), nitrogen dioxide (NO_2), particulate matter less than 10 microns in diameter (PM_{10}), particulate matter less than 2.5 microns in diameter ($PM_{2.5}$), sulfur dioxide (SO_2), and lead.

Air quality conditions in the San Francisco Bay Area have improved since the Air District was created in 1955. Ambient concentrations of air pollutants and the number of days on which the region exceeds air quality standards have fallen. The Air District is in attainment of the State and federal ambient air quality standards for CO, nitrogen oxides (NOx), and SO_2 and the federal 24-hour standard for $PM_{2.5}$. The Air District is not considered to be in attainment with the State PM_{10} and $PM_{2.5}$ standards. The Bay Area is designated as non-attainment for the federal 8-hour and California 1- and 8-hour ozone standards.

Regulatory Background

Criteria Pollutants

At the federal level, the Clean Air Act (CAA) Amendments of 1990 give the U.S. EPA additional authority to require states to reduce emissions of ozone precursors and particulate matter in non-attainment areas. The amendments set attainment deadlines based on the severity of problems. At the state level, CARB has traditionally established state ambient air quality standards, maintained oversight authority in air quality planning, developed programs for reducing emissions from motor vehicles, developed air emission inventories, collected air quality and meteorological data, and approved state implementation plans. At a local level, California's air districts, including the BAAQMD, are responsible for overseeing stationary source emissions, approving permits, maintaining emission inventories, maintaining air quality monitoring stations, overseeing agricultural burning permits, and reviewing air quality-related sections of environmental documents required by CEQA.

The BAAQMD is governed by a 24-member Board of Directors composed of publicly-elected officials apportioned according to the population of the represented counties. The Board has the authority to develop and enforce regulations for the control of air pollution within its jurisdiction. The BAAQMD is responsible for implementing emissions standards and other requirements of federal and state laws. It is also responsible for developing air quality planning documents required by both federal and state laws.

Toxic Air Contaminants

TACs are regulated in the District through federal, state, and local programs. At the federal level, TACs are regulated primarily under the authority of the CAA. Prior to the amendment of the CAA in 1990, source-specific NESHAPs were promulgated under Section 112 of the CAA for certain sources of radionuclides and Hazardous Air Pollutants (HAPs).

Title III of the 1990 CAA amendments requires U.S. EPA to promulgate NESHAPs on a specified schedule for certain categories of sources identified by U.S. EPA as emitting one or more of the 189 listed HAPs. Emission standards for major sources must require the maximum achievable control technology (MACT). MACT is defined as the maximum degree of emission reduction achievable considering cost and non-air quality health and environmental impacts and energy requirements. All NESHAPs were to be promulgated by the year 2000. Specific incremental progress in establishing standards were to be made by the years 1992 (at least 40 source categories), 1994 (25 percent of the listed categories), 1997 (50 percent of remaining listed categories), and 2000 (remaining balance). The 1992 requirement was met; however, many of the four-year standards were not promulgated as scheduled. Promulgation of those standards has been rescheduled based on court ordered deadlines, or the aim to satisfy all Section 112 requirements in a timely manner.

Many of the sources of TACs that have been identified under the CAA are also subject to the California TAC regulatory programs. CARB developed three regulatory programs for the control of TACs. Each of the programs is discussed in the following subsections.

Control of TACs Under the TAC Identification and Control Program: California's TAC identification and control program, adopted in 1983 as Assembly Bill 1807 (AB 1807) (California Health and Safety Code §39662), is a two-step program in which substances are identified as TACs and airborne toxic control measures (ATCMs) are adopted to control emissions from specific sources. Since adoption of the program, CARB has identified 18 TACs, and CARB adopted a regulation designating all 189 federal HAPs as TACs.

Control of TACs Under the Air Toxics "Hot Spots" Act: The Air Toxics Hot Spot Information and Assessment Act of 1987 (AB 2588) (California Health and Safety Code §39656) established a state-wide program to inventory and assess the risks from facilities that emit TACs and to notify the public about significant health risks associated with those emissions. Inventory reports must be updated every four years under current state law. In its implementation of that program, the BAAQMD used a maximum individual cancer risk of 10 in one million (10/M), or an ambient concentration above a non-cancer reference exposure level, as the threshold for notification. Using the best science available at the time, only a relatively small number of facilities exceeded that threshold.

Senate Bill (SB) 1731, enacted in 1992 (California Health and Safety Code §44390 et seq.), amended AB 2588 to include a requirement for facilities with significant risks to prepare and implement a risk reduction plan to reduce the risk below a defined significant risk level within specified time limits. At a minimum, such facilities must, as quickly as feasible, reduce cancer risk levels that exceed 100 per one million (100/M). The BAAQMD adopted risk reduction requirements for perchloroethylene dry cleaners to fulfill the requirements of SB 1731. No facilities within the Bay Area currently exceed the 100/M threshold that would require risk reductions.

Targeted Control of TACs Under the Community Air Risk Evaluation Program: In 2004, BAAQMD initiated the Community Air Risk Evaluation (CARE) program to identify areas with relatively high concentrations of air pollution, including toxic air contaminants (TACs) and fine particulate matter, and populations most vulnerable to air pollution's health impacts. Maps of communities most impacted by air pollution, generated through the CARE program, have been integrated into many BAAQMD programs. For example, BAAQMD uses information derived from the CARE program to develop and implement targeted risk reduction programs, including grant and incentive programs, community outreach efforts, collaboration with other governmental agencies, model ordinances, new regulations for stationary sources and indirect sources, and advocacy for additional legislation.

Discussion of Impacts

III. a).

Neither Rule 11-18 nor Rule 12-16 is expected to conflict with or obstruct implementation of the applicable air quality plan. The 2010 Bay Area Clean Air Plan (CAP) was approved by the Air

District's Board of Directors on September 15, 2010 and is the approved air quality plan that the Air District operates under.

Rule 11-18: Rule 11-18 would require facilities that pose a health risk in excess of the risk action level threshold of ten per million (10/M) cancer risk or 1.0 hazard index for both chronic and acute risk to reduce that risk below the threshold through the implementation of a risk reduction plan approved by the Air District or demonstrate that all significant sources of toxic emissions are control by TBARCT; a significant source of toxic emission would be one that poses a health risk of 1.0/M cancer or 0.2 hazard index. The rule would be implemented in four phases based on either a facility's priority score (PS) or the toxic emissions source type as illustrated in Table 2.1. (Priority scores for all potentially affected facilities are expected to be completed by the end of 2017). Reducing TAC emissions from these facilities would be in harmony with the aims of the 2010 CAP and, therefore, Rule 11-18 would not conflict with or obstruct implementation of the 2010 CAP as it is not expected to interfere with any other District rules and regulations.

Table 2.1 – Rule 11-18 Implementation Phases

Phase	Criterion	HRAs	Risk Reduction Plans	Plan Implementation
1	Cancer PS > 250 or Non-cancer PS >2.5	2017 – 2018	2018 – 2019	2019 – 2022
2	Cancer PS > 10 or Non-cancer PS >1.0	2019 – 2021	2021 – 2022	2022 – 2025
3	Diesel Engines	2021 – 2023	2023 – 2024	2024 – 2027
4	Retail Gas Stations	2023 – 2024	2024 – 2025	2025 – 2028

Rule 12-16: Rule 12-16 would establish facility-wide emissions limits for GHGs, $PM_{2.5}$ and PM_{10}, NOx, and SO_2 at each of the five Bay Area refineries and three refinery-related facilities. Any affected facility that exceeds an emission limit would be a violation of the rule. Limiting emissions from these facilities would be in harmony with the aims of the 2010 CAP and, therefore, Rule 12-16 would not conflict with or obstruct implementation of the 2010 CAP.

III. b, c, and d).

Rule 11-18: Rule 11-18 would reduce the health risk level at which facilities must reduce their risk. There are a large variety of control technologies and measures that could be used to reduce the health risk posed by a facility. A limited listing of such measures is presented in Table 2.2 below.

Table 2.2 – Risk Reduction Measures and Target Substances

Risk Reduction Measure	Substance Group	Control Efficiency
Enclosures	Particulates	Varied
Capture and Collection Systems	VOCs and Particulates	Varied
Diesel Particulate Filter	Particulates	85%
Baghouse	Particulates	99-99.9%

Risk Reduction Measure	Substance Group	Control Efficiency
HEPA filter and pre-filter	Particulates	99.9-99.99%
Carbon Adsorption	VOCs	90-99%
Thermal and Catalytic Oxidizers	VOCs and Inorganic Gases	98-99.9%
Reduced Throughput or Operating Time	VOCS and Particulates	Varied
Alternative Technologies	Particulates	Up to 100%
Product Substitution	VOCs	Up to 100%
Relocate Source or Stack	All TAC Types	Not Applicable
Stack Modifications	All TAC Types	Not Applicable

While the primary purpose of implementing risk reduction measures such as installing air pollution control equipment or making operational changes is to reduce health risks, some types of control equipment have the potential to create secondary adverse air quality impacts. For example, increased NOx emissions could result if VOC emissions are controlled through a combustion process (e.g., afterburner) or require additional energy to operate.

Because of the potential for secondary emissions from air pollution control equipment, there is a potential that sensitive receptors could be exposed to increased pollutant concentrations, which could be significant. As a result, these potential air quality impacts will be evaluated in the Draft EIR.

Rule 12-16: A number of air quality rules and regulations that apply to refineries are enforced by the BAAQMD. These existing rules and regulations require: (1) air permits; (2) the use of best available control technology (BACT); (3) new source review for new emission sources and offsets for new emissions; (4) control of toxic air contaminants; (5) control of fugitive emission sources including storage tanks, equipment leaks, bulk loading, and wastewater separators; and (6) control of emissions from combustion sources, including process heaters, boilers, internal combustion engines, gas turbines, catalytic cracking and reforming units, and flares. Rule 12-16 could require modifications to refineries to ensure changes in operations do not result in emissions increases either through the installation of air pollution control equipment or changes in operations.

Although the primary effect of installing air pollution control equipment is to reduce emissions of a particular pollutant, e.g., VOCs, some types of control equipment have the potential to create secondary adverse air quality impacts, e.g., increased NOx emissions if VOC emissions are controlled through a combustion process (e.g., afterburner) or require additional energy to operate. Control measures aimed at reducing NOx from stationary sources may use ammonia for control (e.g., selective catalytic reduction). Ammonia use could result in increased ammonia emissions and, since ammonia is a precursor to particulate formation, increased particulate formation in the atmosphere. Because of the potential for secondary emissions from air pollution control equipment, there is a potential that sensitive receptors could be exposed to increased pollutant concentrations, which could be significant. As a result, these potential air quality impacts of Rule 12-16 will be evaluated in the Draft EIR.

III. e).

Rule 11-18: Rule 11-18 would require facilities that pose significant health risks to develop a plan to reduce that risk or apply TBARCT to all significant sources of risk at the facility. The measures that a facility could potentially implement to reduce its risk are listed above in Table 2.2 and generally would not result in the creation of objectionable odors that could affect a substantial number of people.

Rule 12-16: Rule 12-16 would establish facility-wide emissions limits for GHGs, $PM_{2.5}$ and PM_{10}, NOx, and SO_2 at each of the five Bay Area refineries and three refinery-related facilities. The rule is not expected to result in an increase in odorous emissions at the refineries. Odorous emissions are not specifically covered by Rule 12-16 and while not specifically aimed at reducing emissions of compounds that are considered odorous, e.g., hydrogen sulfide (H_2S), which is the primary odorous compound emitted from the refineries, the rule would not result in an increase in H_2S or other odorous sulfur-containing compounds. Therefore, the rule is not expected to result in an increase in the generation of emissions that could generate odors.

Conclusions

Implementation of Rule 11-18 would reduce risk from facilities that emit toxic air contaminants throughout the Bay Area. However, certain risk reduction measures have the potential to increase emissions of other pollutants, such as GHGs and criteria pollutants. Implementation of Rule 12-16 would prevent refinery emissions of GHGs and some criteria pollutants from increasing. Similarly, secondary adverse air quality impacts could occur from installing control equipment at individual refineries in response to changes that could increase emissions of criteria pollutants. Adverse impacts include increased criteria pollutant and TAC emissions from certain types of air pollution control equipment. Therefore, potential adverse secondary air quality impacts which could result from implementing either Rule 11-18 or Rule 12-16 will be evaluated in the Draft EIR. No significant impacts were identified on air quality plans or the generation of odors and these topics will not be addressed further in the Draft EIR.

IV. BIOLOGICAL RESOURCES.

Would the project:	Potentially Significant Impact	Less Than Significant Impact with Mitigation Incorporated	Less-than-Significant Impact	No Impact
a) Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Wildlife or U.S. Fish and Wildlife Service?				
Rule 11-18	☐	☐	☐	☑
Rule 12-16	☐	☐	☐	☑
b) Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, or regulations, or by the California Department of Fish and Wildlife or U.S. Fish and Wildlife Service?				
Rule 11-18	☐	☐	☐	☑
Rule 12-16	☐	☐	☐	☑
c) Have a substantial adverse effect on federally protected wetlands as defined by Section 404 of the Clean Water Act (including, but not limited to, marsh, vernal pool, coastal wetlands, etc.) through direct removal, filling, hydrological interruption, or other means?				
Rule 11-18	☐	☐	☐	☑
Rule 12-16	☐	☐	☐	☑
d) Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites?				
Rule 11-18	☐	☐	☐	☑
Rule 12-16	☐	☐	☐	☑
e) Conflicting with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?				
Rule 11-18	☐	☐	☐	☑
Rule 12-16	☐	☐	☐	☑

Would the project:	Potentially Significant Impact	Less Than Significant Impact with Mitigation Incorporated	Less-than-Significant Impact	No Impact
f) Conflict with the provisions of an adopted habitat conservation plan, natural community conservation plan, or other approved local, regional, or state habitat conservation plan?				
Rule 11-18	☐	☐	☐	☑
Rule 12-16	☐	☐	☐	☑

Setting

The BAAQMD covers all of Alameda, Contra Costa, Marin, San Francisco, San Mateo, Santa Clara, and Napa Counties and portions of southwestern Solano and southern Sonoma Counties. The area of coverage is vast (about 5,600 square miles) so that land uses vary greatly and include commercial, industrial, residential, agricultural, and open space uses. A wide variety of biological resources are located within the Bay Area.

The areas affected by the rules are located in the Bay Area-Delta Bioregion (as defined by the State's Natural Communities Conservation Program). This Bioregion is comprised of a variety of natural communities, which range from salt marshes to chaparral to oak woodland.

Rule 11-18: Hundreds of facilities located throughout the Bioregion would be affected by Rule 11-18. The facilities that would be affected by Rule 11-18 are expected to be located in developed commercial and industrial areas within the Bay Area. These commercial/industrial areas have been graded to develop the various structures, and are typically surrounded by other commercial and industrial facilities. Native vegetation, other than landscape vegetation, has usually been removed from these facilities.

Rule 12-16: Four of the refineries affected by the Rule 12-16 are located in Contra Costa County and one is located in Solano County (Valero). The refineries affected by Rule 12-16 have been developed with various permanent refinery structures, buildings, operating units and storage tanks. Native vegetation, other than landscape vegetation, has generally been removed from the refineries to minimize safety and fire hazards.

Regulatory Background

Biological resources are protected by the City and/or County General Plans through land use and zoning requirements which minimize or prohibit development in biologically sensitive areas. Biological resources are also protected by the California Department of Fish and Wildlife, and the U.S. Fish and Wildlife Service. The U.S Fish and Wildlife Service and National Marine Fisheries Service oversee the federal Endangered Species Act. Development permits may be required from one or both of these agencies if development would impact rare or endangered species. The California Department of Fish and Wildlife administers the California Endangered Species Act which prohibits impacting endangered and threatened species. The U.S. Army Corps of Engineers and the U.S. Environmental Protection

Agency (U.S. EPA) regulate the discharge of dredge or fill material into waters of the United States, including wetlands.

Discussion of Impacts

IV. a), b), and d).

Rule 11-18: The facilities affected by Rule 11-18 are expected to be located in the commercial and industrial areas within the Bay Area. These commercial/industrial areas have been graded to develop the various structures, and are typically surrounded by other commercial and industrial facilities. Native vegetation, other than landscape vegetation, has usually been removed from these facilities.

Similarly, modifications at existing facilities would not interfere substantially with the movement of any native resident or migratory fish or wildlife species or with native or resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites. Further, since the Rule 11-18 would primarily regulate stationary emission sources at commercial or industrial facilities, it would not directly or indirectly affect riparian habitat or other sensitive natural communities identified in local or regional plans, policies, or regulations, or identified by the CDFG or U.S. Fish and Wildlife Service. Improved air quality resulting from Rule 11-18 would be expected to provide health benefits to plant and animal species in the District.

Rule 12-16: No impacts on biological resources are anticipated from the Rule 12-16 which would apply to existing refineries. The refinery facilities have been graded and developed, and biological resources, with the exception of landscape species, have been removed. Construction of any air pollution control equipment would take place within the operating portions of existing refineries which are void of biological resources. As a result, there would be no direct or indirect impact on sensitive biological resources riparian habitats, or protected wetlands. The installation of air pollution control equipment would also not interfere with the movement of any migratory fish or wildlife species or affect migratory corridors; would not conflict with local policies or ordinances protecting biological resources; and would not conflict with an adopted habitat conservation plan.

IV. c).

Rule 11-18: No direct or indirect impacts from implementing the Rule 11-18 were identified which could adversely affect plant and/or animal species in the District. Implementing the Rule 11-18 would result in installation of new or modifications of existing equipment at commercial or industrial facilities to control or further control toxic emissions. Existing commercial or industrial facilities are generally located in appropriately zoned commercial or industrial areas, this work would not impact marshes, vernal pools, wetlands, etc. For these reasons the rule is not expected to adversely affect protected wetlands as defined by §404 of the Clean Water Act, including, but not limited to marshes, vernal pools, coastal wetlands, etc., through direct removal, filling, hydrological interruption or other means.

Rule 12-16: Compliance with the Rule 12-16 could result in the installation of additional air pollution control equipment at existing refineries. The installation of air pollution control equipment at these facilities would be consistent with industrial land uses. The operating portions of the existing refineries do not contain marshes, vernal pools, wetlands, etc. Therefore, construction would not impact these biological resources. For these reasons the rule is not expected to adversely affect protected wetlands as defined by §404 of the Clean Water Act, including, but not limited to marshes, vernal pools, coastal wetlands, etc., through direct removal, filling, hydrological interruption or other means.

IV. e and f).

Rule 11-18: Rule 11-18 may require modifications at existing industrial or commercial facilities to control or further control emissions at these affected facilities. As a result, the rule will not conflict with any land use policies or ordinances protecting biological resources. Similarly, the rule will not conflict with any habitat conservation or natural community conservation plans, agricultural resources or operations, and would not create divisions in any existing communities.

Rule 12-16: Rule 12-16 wills not conflict with any land use plans, local policies or ordinances, or regulations protecting biological resources for the reasons already given. Similarly, the rule is not expected to conflict with any habitat conservation or natural community conservation plans, agricultural resources or operations, and would not create divisions in any existing communities.

Conclusions

Based upon the above considerations, significant adverse project-specific impacts to biological resources are not expected to occur due to implementation of either Rule 11-18 or Rule 12-16 and, therefore, will not be further evaluated in the Draft EIR.

V. CULTURAL RESOURCES.

Would the project:	Potentially Significant Impact	Less Than Significant Impact with Mitigation Incorporated	Less-than-Significant Impact	No Impact
a) Cause a substantial adverse change in the significance of a historical resource as defined in §15064.5?				
Rule 11-18	☐	☐	☐	☑
Rule 12-16	☐	☐	☐	☑
b) Cause a substantial adverse change in the significance of an archaeological resource pursuant to §15064.5?				
Rule 11-18	☐	☐	☐	☑
Rule 12-16	☐	☐	☐	☑
c) Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?				
Rule 11-18	☐	☐	☐	☑
Rule 12-16	☐	☐	☐	☑
d) Disturb any human remains, including those interred outside of formal cemeteries?				
Rule 11-18	☐	☐	☐	☑
Rule 12-16	☐	☐	☐	☑

Setting

The BAAQMD covers all of Alameda, Contra Costa, Marin, San Francisco, San Mateo, Santa Clara, and Napa Counties and portions of southwestern Solano and southern Sonoma Counties. The area of coverage is vast (about 5,600 square miles) so that land uses vary greatly and include commercial, industrial, residential, agricultural and open space uses. Cultural resources are defined as buildings, sites, structures, or objects which might have historical architectural, archaeological, cultural, or scientific importance.

The Carquinez Strait represents the entry point for the Sacramento and San Joaquin Rivers into the San Francisco Bay. This locality lies within the San Francisco Bay and the west end of the Central Valley archaeological regions, both of which contain a rich array of prehistoric and historical cultural resources. The areas surrounding the Carquinez Strait and Suisun Bay have been occupied for millennia.

Regulatory Background

The State CEQA Guidelines define a significant cultural resource as a "resource listed or eligible for listing on the California Register of Historical Resources" (Public Resources Code §5024.1). A project would have a significant impact if it would cause a substantial adverse change in the significance of a historical resource (State CEQA Guidelines §15064.5(b)). A substantial adverse change in the significance of a historical resource would result from an action that would demolish or adversely alter the physical characteristics of the historical resource that convey its historical significance and that qualify the resource for inclusion in the California Register of Historical Resources or a local register or survey that meets the requirements of Public Resources Code §§50020.1(k) and 5024.1(g).

Discussion of Impacts

V. a, b, c and d).

<u>Rule 11-18</u>: Implementing Rule 11-18 is primarily expected to result in controlling stationary source emissions at commercial or industrial facilities. Affected facilities are typically located in appropriately zoned commercial or industrial areas that have previously been graded and developed. Because stationary source emissions from existing facilities does not typically require extensive cut-and-fill activities, or excavation, it is unlikely that additional stationary source control measures that may result from Rule 11-18 will: (1) adversely affect historical or archaeological resources as defined in CEQA Guidelines §15064.5; (2) destroy unique paleontological resources or unique geologic features; or (3) disturb human remains interred outside formal cemeteries.

In a small number of cases, the Rule 11-18 may require minor site preparation and grading at an affected facility to install new or modify existing equipment. Under this circumstance, it is possible that archaeological or paleontological resources could be uncovered. Even if this circumstance were to occur, significant adverse cultural resource impacts are not anticipated because there are existing laws in place that are designed to protect and mitigate potential adverse impacts to cultural resources. As with any construction activity, should archaeological resources be found during construction that results from implementing the rule, the activity would cease until a thorough archaeological assessment is conducted.

<u>Rule 12-16</u>: No impacts on cultural resources are anticipated from the Rule 12-16 that would apply to existing refineries. Historic resources are typically not located within refineries and no demolition activities are expected to be required. As a result, no impacts on historic resources are expected. Construction activities would be limited to areas within existing refineries boundaries, i.e., within areas that have already been graded and developed. Therefore, construction activities are not expected to impact cultural resources, including historical and archaeological resources, either directly or indirectly, or disturb human remains.

Conclusions

Based upon the above considerations, significant adverse project-specific impacts to cultural resources are not expected to occur due to implementation of Rule 11-18 and 12-16 and, therefore, will not be further evaluated in the Draft EIR.

VI. GEOLOGY AND SOILS.

Would the project:	Potentially Significant Impact	Less Than Significant Impact with Mitigation Incorporated	Less-than-Significant Impact	No Impact
a) Expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving:				
i) Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault? Refer to Division of Mines and Geology Special Publication 42.				
Rule 11-18	☐	☐	☐	☑
Rule 12-16	☐	☐	☐	☑
ii) Strong seismic ground shaking?				
Rule 11-18	☐	☐	☑	☐
Rule 12-16	☐	☐	☑	☐
iii) Seismic-related ground failure, including liquefaction?				
Rule 11-18	☐	☐	☑	☐
Rule 12-16	☐	☐	☑	☐
iv) Landslides?				
Rule 11-18	☐	☐	☑	☐
Rule 12-16	☐	☐	☑	☐
b) Result in substantial soil erosion or the loss of topsoil?				
Rule 11-18	☐	☐	☐	☑
Rule 12-16	☐	☐	☐	☑
c) Be located on a geologic unit or soil that is unstable or that would become unstable as a result of the project, and potentially result in onsite or offsite landslide, lateral spreading, subsidence, liquefaction or collapse?				
Rule 11-18	☐	☐	☑	☐
Rule 12-16	☐	☐	☑	☐
d) Be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial risks to life or property?				
Rule 11-18	☐	☐	☐	☑
Rule 12-16	☐	☐	☐	☑

Would the project:	Potentially Significant Impact	Less Than Significant Impact with Mitigation Incorporated	Less-than-Significant Impact	No Impact
e) Have soils incapable of adequately supporting the use of septic tanks or alternative wastewater disposal systems in areas where sewers are not available for the disposal of wastewater?				
Rule 11-18	☐	☐	☐	☑
Rule 12-16	☐	☐	☐	☑

Setting

The BAAQMD covers all of Alameda, Contra Costa, Marin, San Francisco, San Mateo, Santa Clara, and Napa Counties and portions of southwestern Solano and southern Sonoma Counties. The area of coverage is vast (about 5,600 square miles) so that land uses vary greatly and include commercial, industrial, residential, agricultural, and open space uses. The facilities affected by the rules are located primarily in commercial and industrial areas within the Bay Area.

The affected facilities are located in the natural region of California known as the Coast Ranges geomorphic province. The province is characterized by a series of northwest trending ridges and valleys controlled by tectonic folding and faulting, examples of which include the Suisun Bay, East Bay Hills, Briones Hills, Vaca Mountains, Napa Valley, and Diablo Ranges.

Regional basement rocks consist of the highly deformed Great Valley Sequence, which include massive beds of sandstone inter-fingered with siltstone and shale. Unconsolidated alluvial deposits, artificial fill, and estuarine deposits, (including Bay Mud) underlie the low-lying region along the margins of the Carquinez Straight and Suisun Bay. The estuarine sediments found along the shorelines of Solano County are soft, water-saturated mud, peat and loose sands. The organic, soft, clay-rich sediments along the San Francisco and San Pablo Bays are referred to locally as Bay Mud and can present a variety of engineering challenges due to inherent low strength, compressibility and saturated conditions. Landslides in the region occur in weak, easily weathered bedrock on relatively steep slopes.

The San Francisco Bay Area is a seismically active region, which is situated on a plate boundary marked by the San Andreas Fault System. Several northwest trending active and potentially active faults are included with this fault system. Under the Alquist-Priolo Earthquake Fault Zoning Act, Earthquake Fault Zones were established by the California Division of Mines and Geology along "active" faults, or faults along which surface rupture occurred in Holocene time (the last 11,000 years). In the Bay area, these faults include the San Andreas, Hayward, Rodgers Creek-Healdsburg, Concord-Green Valley, Greenville-Marsh Creek, Seal Cove/San Gregorio and West Napa faults. Other smaller faults in the region classified as potentially active include the Southampton and Franklin faults.

Ground movement intensity during an earthquake can vary depending on the overall magnitude, distance to the fault, focus of earthquake energy, and type of geological material. Areas that are underlain by bedrock tend to experience less ground shaking than those underlain by unconsolidated sediments such as artificial fill. Earthquake ground shaking may have secondary effects on certain foundation materials, including liquefaction, seismically induced settlement, and lateral spreading.

Regulatory Background

Construction is regulated by local City or County building codes and ordinances that regulate construction, grading, excavations, use of fill, and foundation work including type of materials, design, procedures, etc. which are intended to limit the probability of occurrence and the severity of consequences from geological hazards. Necessary permits, plan checks, and inspections are generally required.

All City or County General Plans include a Safety Element. The Element identifies seismic hazards and their location in order that they may be taken into account in the planning of future development. The California Building Code is the principle mechanism for protection against and relief from the danger of earthquakes and related events.

In addition, the Seismic Hazard Zone Mapping Act (Public Resources Code §§2690 – 2699.6) was passed by the California legislature in 1990 following the Loma Prieta earthquake. The act required that the California Division of Mines and Geology (DMG) develop maps that identify the areas of the state that require site specific investigation for earthquake-triggered landslides and/or potential liquefaction prior to permitting most urban developments. The act directs cities, counties, and state agencies to use the maps in their land use planning and permitting processes.

Local governments are responsible for implementing the requirements of the Seismic Hazards Mapping Act. The maps and guidelines are tools for local governments to use in establishing their land use management policies and in developing ordinances and review procedures that will reduce losses from ground failure during future earthquakes.

Discussion of Impacts

VI. a, c, and d).

Rule 11-18: The rule will not directly expose people or structures to earthquake faults, seismic shaking, seismic-related ground failure including liquefaction, landslides, mudslides or substantial soil erosion, as BAAQMD rules or regulations do not directly or indirectly result in construction of new structures. Some new structures, or structural modifications at existing affected facilities may occur as a result of installing control equipment or making process modifications. In any event, existing affected facilities or modifications to existing facilities would be required to comply with relevant California Building Code requirements in effect at the time of initial construction or modification of a structure.

New structures must be designed to comply with the California Building Code Zone 4 requirements since the Air District is located in a seismically active area. The local cities or counties are responsible for assuring that projects comply with the Uniform Building Code and can conduct inspections to ensure compliance. The California Building Code is considered to be a standard safeguard against major structural failures and loss of life. The goal of the Code is to provide structures that will: (1) resist minor earthquakes without damage; (2) resist moderate earthquakes without structural damage but with some non-structural damage; and (3) resist major earthquakes without collapse but with some structural and non-structural damage. The California Building Code bases seismic design on minimum lateral seismic forces ("ground shaking") and operates on the principle that providing appropriate foundations, among other aspects, helps to protect buildings from failure during earthquakes. The basic formulas used for the California Building Code seismic design require determination of the seismic zone and site coefficient, which represents the foundation conditions at the site.

Any potentially affected facilities that are located in areas where there has been historic occurrence of liquefaction, e.g., coastal zones, or existing conditions indicate a potential for liquefaction, including expansive or unconsolidated granular soils and a high water table, may have the potential for liquefaction induced impacts at the project sites. The California Building Code requirements consider liquefaction potential and establish more stringent requirements for building foundations in areas potentially subject to liquefaction. Therefore, compliance with the California Building Code requirements is expected to minimize the potential impacts associated with liquefaction. The issuance of building permits from the local cities or counties will assure compliance with the California Building Code requirements. Therefore, no significant impacts from liquefaction are expected.

Because facilities affected by any Air District control equipment requirements are typically located in industrial or commercial areas, which are not usually located near known geological hazards (e.g., landslide, mudflow, seiche, or volcanic hazards), no significant adverse geological impacts are expected. In addition, although refineries and possibly other facilities are located along the shoreline and may be affected by flooding from tsunamis, modifying existing equipment or installing new equipment to further control emissions from an existing facility will not expose people to new risks from tsunamis.

Rule 12-16: The petroleum refineries affected by Rule 12-16 already exist and operate within the confines of existing industrial facilities in the Bay Area. Construction activities could be required to install air pollution control equipment associated with complying with the refinery-wide emissions limits. Any substantial construction activities associated with new refinery equipment would occur within the confines of existing refineries and would be required to comply with the California Building Code. The California Building Code is considered to be a standard safeguard against major structural failures and loss of life. Any construction at industrial facilities regulated by the rule will be constructed in compliance with the California Building Code. The goal of the code is to provide structures that will: (1) resist minor earthquakes without damage; (2) resist moderate earthquakes without structural damage, but with some non-structural damage; and (3) resist major earthquakes without collapse, but with some structural and non-structural damage. The California Building Code bases seismic design on minimum lateral seismic forces ("ground shaking"). The California Building Code requirements operate on the principle that providing appropriate foundations, among other aspects, helps to protect buildings from failure during earthquakes. The basic formulas used for the California Building Code seismic design require determination of the seismic zone and site coefficient, which represent the foundation conditions at the site. Compliance with the California Building Code would minimize the impacts associated with existing geological hazards.

Any new development at the petroleum refineries affected by the rule would be required to obtain building permits, as applicable, for new foundations and structures at any site. The issuance of building permits from the local agency will assure compliance with the California Building Code, which include requirements for building within seismic hazard zones. No significant impacts from seismic hazards are expected since the construction of any new structures would be required to comply with the California Building Code.

Because facilities affected by any Air District control equipment requirements are typically located in industrial or commercial areas, which are not usually located near known geological hazards (e.g., landslide, mudflow, seiche, or volcanic hazards), no significant adverse geological impacts are expected. In addition, although refineries and possibly other facilities are located along the shoreline and may be affected by flooding from tsunamis, modifying existing equipment or installing new equipment to further control emissions from an existing facility will not expose people to new risks from tsunamis.

VI. b).

Rule 11-18: Although Rule 11-18 may require modifications at existing industrial or commercial facilities, such modifications are not expected to require substantial grading or construction activities. Any new air pollution control equipment is not expected to substantially increase the area subject to compaction since the subject areas would be limited in size and, typically, have already been graded or displaced in some way. Therefore, significant adverse soil erosion impacts are not anticipated from implementing Rule 11-18.

Rule 12-16: Any construction activities would be limited to the confines of existing refineries which are already graded and developed. Rule 12-16 is not expected to result in substantial soil erosion or the loss of topsoil as construction activities would be limited to areas that have been already been graded and developed, and adjacent to other existing refinery operations.

VI. e).

Rule 11-18: The CEQA environmental checklist includes a discussion of septic tanks and alternative wastewater disposal systems within the discussion of Geology and Soils. Therefore, a discussion of septic tanks and alternative septic systems is included herein for completeness. Septic tanks or other similar alternative wastewater disposal systems are typically associated with small residential projects in remote areas. The rule does not contain any requirements which generate construction of residential projects in remote areas. Rule 11-18 would only affect existing industrial or commercial facilities, which already are hooked up to appropriate sewerage facilities, and therefore no impacts on septic tanks or alternative wastewater disposal systems are expected.

Rule 12-16: Septic tanks or other similar alternative wastewater disposal systems are typically associated with small residential projects in remote areas. Rule 12-16 would only affect existing refineries that are already connected to appropriate wastewater facilities. Based on these considerations, septic tanks or other alternative wastewater disposal systems are not expected to be impacted by Rule 12-16.

Conclusions

Based upon the above considerations, significant adverse project-specific impacts to geology and soils are not expected to occur due to implementation of Rule 11-18 and 12-16 and, therefore, will not be further evaluated in the Draft EIR.

VII. GREENHOUSE GAS EMISSIONS.

Would the project:	Potentially Significant Impact	Less Than Significant Impact with Mitigation Incorporated	Less-than-Significant Impact	No Impact
a) Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment?				
Rule 11-18	☑	☐	☐	☐
Rule 12-16	☑	☐	☐	☐
b) Conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases?				
Rule 11-18	☐	☐	☑	☐
Rule 12-16	☑	☐	☐	☐

Setting

Global climate change refers to changes in average climatic conditions on the earth as a whole, including temperature, wind patterns, precipitation and storms. Global warming, a related concept, is the observed increase in the average temperature of the earth's surface and atmosphere. One identified cause of global warming is an increase of greenhouse gases (GHGs) in the atmosphere. The six major GHGs identified by the Kyoto Protocol are carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), sulfur hexafluoride (SF_6), haloalkanes (HFCs), and perfluorocarbons (PFCs). The GHGs absorb longwave radiant energy reflected by the earth, which warms the atmosphere. GHGs also radiate longwave radiation both upward to space and back down toward the surface of the earth. The downward part of this longwave radiation absorbed by the atmosphere is known as the "greenhouse effect." Some studies indicate that the potential effects of global climate change may include rising surface temperatures, loss in snow pack, sea level rise, more extreme heat days per year, and more drought years.

Events and activities, such as the industrial revolution and the increased combustion of fossil fuels (e.g., gasoline, diesel, coal, etc.), have heavily contributed to the increase in atmospheric levels of GHGs. Approximately 80 percent of GHG emissions in California are from fossil fuel combustion and over 70 percent of GHG emissions are carbon dioxide emissions (BAAQMD, 2010).

Regulatory Background

In response to growing scientific and political concern regarding global climate change, California has taken the initiative to address the state's greenhouse gas emissions. California has adopted the Global Warming Solutions Act of 2006, also known as AB 32, which requires the state to reduce its GHG emissions to 1990 levels by 2020. In addition, in 2005 Governor Schwarzenegger adopted Executive Order S-3-05, which commits to achieving an 80 percent reduction below 1990 levels by 2050. The

California Air Resources Board (CARB) has begun implementation of these mandates through adoption of regulatory requirements to reduce GHG emissions (among other agency implementation actions). Major sources of GHG emissions are under CARB's AB32 cap and trade program, which established a limit on GHG emissions for each source. GHG emissions over the limit require additional GHG emission reductions or purchase of GHG emission credits from sources that had excess emission credits.

Senate Bills 1078 and 107 and Executive Order S-14-08 (2008): SB 1078 (Chapter 516, Statutes of 2002) required retail sellers of electricity to provide at least 20 percent of their supply from renewable sources by 2017. SB 107 (Chapter 464, Statutes of 2006) changed the target date to 2010. In November 2008, then Governor Schwarzenegger signed EO S-14-08, which expands the state's Renewable Portfolio Standard to 33 percent renewable power by 2020. Governor Brown signed EO B-30-15 in 2015 in order to reduce GHG emissions by 40 percent below 1990 levels by 2030 to ensure California meets its target of reducing GHG emissions to 80 percent of 1990 levels by 2050.

The Clean Energy and Pollution Reduction Act of 2015, SB 350 (Chapter 547, Statutes of 2015) was approved by Governor Brown on October 7, 2015. SB 350 will (1) increase the standards of the California RPS program by requiring that the amount of electricity generated and sold to retail customers per year from eligible renewable energy resources be increased to 50 percent by December 31, 2030; (2) require the State Energy Resources Conservation and Development Commission to establish annual targets for statewide energy efficiency savings and demand reduction that will achieve a cumulative doubling of statewide energy efficiency savings in electricity and natural gas final end uses of retail customers by January 1, 2030; (3) provide for the evolution of the Independent System Operator (ISO) into a regional organization; and (4) require the state to reimburse local agencies and school districts for certain costs mandated by the state through procedures established by statutory provisions.

SB 862: In June 2014, SB 862 (Chapter 36, Statutes of 2014) established long-term funding programs from the Cap and Trade program for transit, sustainable communities and affordable housing, and high speed rail. SB 862 allocates 60 percent of ongoing Cap and Trade revenues, beginning in 2015–2016, to these programs. The remaining 40 percent is to be determined by future legislatures. A minimum of 25 percent of Cap and Trade dollars must go to projects that provide benefits to disadvantaged communities, and a minimum of 10 percent must go to projects located within those disadvantaged communities. In addition, this bill established the CalRecycle Greenhouse Gas Reduction Revolving Loan Program and Fund.

Most recently, SB 32 was signed into law in September 2016 and requires the California Air Resources Board (ARB) to ensure that statewide greenhouse gas emissions are reduced to 40% below the 1990 level by 2030. ARB is developing a 2030 Target Scoping Plan to implement this charge and expects to release a draft of the plan around the end of the year.

At the federal level, the U.S. EPA has adopted GHG emissions limits for new light-duty cars and trucks. This regulation of mobile sources has in turn triggered New Source Review and Title V permitting requirements for stationary sources. These requirements include using Best Available Control Technology to control emissions from major facilities. In addition, the U.S. EPA is also in the process of adopting New Source Performance Standards for major GHG source categories (currently limited to electric utility generating units).

The U.S. Congress passed "The Consolidated Appropriations Act of 2008" (HR 2764) in December 2007, which requires reporting of GHG data and other relevant information from large emission sources and suppliers in the United States. The Rule is referred to as 40 Code of Federal Regulations (CFR) 4 Part 98 - Greenhouse Gas Reporting Program (GHGRP). Facilities that emit 25,000 metric tonnes or more per year of GHGs are required to submit annual reports to U.S. EPA.

Discussion of Impacts

VII. a).

Rule 11-18: Rule 11-18 is designed to reduce the health risk associated with facilities that emit toxic air contaminants. There are several ways the risk associated with a facility can be reduced, which are outline in Table 2. 2. Included under this listing are:

- Enclosures and collection systems for particulate matter TACs;
- Filtration for toxic aerosols and particulate matter;
- Carbon adsorption and adsorption-oxidation systems for VOCs;
- Chemical absorption for VOCs;
- Thermal and catalytic oxidation for inorganic gases (such as hydrogen sulfide) and organic compounds; and
- Combination systems for the control of halogenated VOCs;

Each of the control options listed above has associated with it the potential to increase use of fuels, for combustion sources (e.g., electricity, natural gas, or refinery fuel gas), potentially generating additional greenhouse gas emission impacts. Construction activities for new and modified control devices may also result in GHG emissions. Therefore, GHG impacts from Rule 11-18 will be evaluated in the Draft EIR.

Rule 12-16: Rule 12-16 is designed to limit facility-wide emissions of GHGs and three criteria pollutants from the five petroleum refineries located within the jurisdiction of the BAAQMD. Rule 12-16 sets limits on the amount of these pollutants each refinery could emit annually and could require the installation of additional air pollution control equipment or modification of refinery operations to ensure each refinery stays within those limits. The rule could require new construction activities and the operation of new/modified refinery equipment. While, the goal of Rule 12-16 is to minimize overall refinery emissions, however, refinery modifications could result in the increased use of fuel for combustions sources (e.g., electricity, natural gas, or refinery fuel gas), potentially generating additional greenhouse gas emission impacts. As a result, the impacts of this rule on greenhouse gases will be further evaluated in the Draft EIR.

VII. b).

Rule 11-18: Rule 11-18 would require facilities that pose a health risk in excess of a risk action level either reduce risks below the thresholds or apply TBARCT. However, these requirements would not conflict with any efforts by the state or the Air District to reduce GHG emissions. Because no potential conflicts on GHG plans, policies or regulations were identified, this topic will not be evaluated in the Draft EIR for Rule 11-18.

Rule 12-16: As written, Rule 12-16 would have a direct impact on GHG emissions from all Bay Area refineries by setting an upper limit on the amount of GHGs each refinery can emit. The AB 32 Cap and Trade program allows covered facilities to buy and sell GHG emissions credits. Under Rule 12-16, Bay Area refineries would not be allowed to purchase GHG credits that would allow an increase in excess of the refinery-wide GHG limit. So, theoretically, under the Cap and Trade program, the GHG emissions of an individual refinery could increase while the overall goals of the program are being met. Because the GHG limits of Rule 12-16 could conflict with this aspect of the ARB's AB32 cap and trade program, the potential impacts of this conflict will be evaluated in the Draft EIR.

Conclusions

Based upon the above considerations, the potential GHG emissions associated with Rules 11-18 and 12-16 will be evaluated in the Draft EIR. No significant impacts on GHG plans, policies, or regulations were identified for Rule 11-18, so this topic will not be addressed further in the Draft EIR for Rule 11-18. However, potentially significant impacts were identified for Rule 12-16, and therefore this topic will be addressed in the Draft EIR.

VIII. HAZARDS AND HAZARDOUS MATERIALS.

Would the project:	Potentially Significant Impact	Less Than Significant Impact with Mitigation Incorporated	Less-than-Significant Impact	No Impact
a) Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials?				
Rule 11-18	☐	☐	☑	☐
Rule 12-16	☑	☐	☐	☐
b) Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment?				
Rule 11-18	☐	☐	☑	☐
Rule 12-16	☑	☐	☐	☐
c) Emit hazardous emissions or involve handling hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school?				
Rule 11-18	☐	☐	☐	☑
Rule 12-16	☑	☐	☐	☐
d) Be located on a site that is included on a list of hazardous materials sites compiled pursuant to Government Code § 65962.5 and, as a result, would it create a significant hazard to the public or the environment?				
Rule 11-18	☐	☐	☑	☐
Rule 12-16	☐	☐	☐	☑
e) For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, and result in a safety hazard for people residing or working in the project area?				
Rule 11-18	☐	☐	☐	☑
Rule 12-16	☐	☐	☐	☑
f) For a project within the vicinity of a private airstrip, would the project result in a safety hazard for people residing or working in the project area?				
Rule 11-18	☐	☐	☐	☑
Rule 12-16	☐	☐	☐	☑
g) Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?				
Rule 11-18	☐	☐	☐	☑
Rule 12-16	☐	☐	☐	☑

Would the project:	Potentially Significant Impact	Less Than Significant Impact with Mitigation Incorporated	Less-than-Significant Impact	No Impact
h) Expose people or structures to a significant risk of loss, injury or death involving wildland fires, including where wildlands are adjacent to urbanized areas or where residences are intermixed with wildlands?				
Rule 11-18	☐	☐	☑	☐
Rule 12-16	☐	☐	☐	☑

Setting

The BAAQMD covers all of Alameda, Contra Costa, Marin, Napa, San Francisco, San Mateo, and Santa Clara Counties, and potions of western Solano and southern Sonoma Counties. Because the area of coverage is vast (approximately 5,600 square miles), land uses vary greatly and include commercial, industrial, residential, and agricultural uses.

Facilities and operations within the Air District handle and process substantial quantities of flammable materials and acutely toxic substances. Accidents involving these substances can result in worker or public exposure to fire, heat, blast from an explosion, or airborne exposure to hazardous substances.

Fires can expose the public or workers to heat. The heat decreases rapidly with distance from the flame and therefore poses a greater risk to workers at specific facilities where flammable materials and toxic substances are handled than to the public. Explosions can generate a shock wave, but the risks from explosion also decrease with distance. Airborne releases of hazardous materials may affect workers or the public, and the risks depend upon the location of the release, the hazards associated with the material, the winds at the time of the release, and the proximity of receptors.

For all facilities and operations handling flammable materials and toxic substances, risks to the public are reduced if there is a buffer zone between process units and residences or if prevailing winds blow away from residences. Thus, the risks posed by operations at a given facility or operation are unique and determined by a variety of factors.

Rule 11-18 has the potential to affect a large variety of facilities that emit toxic pollutants, including petroleum refineries, chemical plants, foundries, a cement kiln, gasoline dispensing facilities, data centers, hospitals, crematoria, residential buildings, fire stations, schools and universities, military installations, etc. Rule 12-16 would affect petroleum refineries that handle and process large quantities of flammable, hazardous, and acutely hazardous materials. Accidents involving these substances can result in worker or public exposure to fire, heat, blast from an explosion, or airborne exposure to hazardous substances.

The potential hazards associated with handling such materials are a function of the materials being processed, processing systems, and procedures used to operate and maintain the facilities where they exist. The hazards that are likely to exist are identified by the physical and chemical properties of the materials being handled and their process conditions, including the following events.

- **Toxic gas clouds:** Toxic gas clouds are releases of volatile chemicals (e.g., anhydrous ammonia, chlorine, and hydrogen sulfide) that could form a cloud and migrate off-site, thus exposing the public. "Worst-case" conditions tend to arise when very low wind speeds coincide with an accidental release, which can allow the chemicals to accumulate rather than disperse.

- **Torch fires (gas and liquefied gas releases), flash fires (liquefied gas releases), pool fires, and vapor cloud explosions (gas and liquefied gas releases):** The rupture of a storage tank or vessel containing a flammable gaseous material (like propane), without immediate ignition, can result in a vapor cloud explosion. The "worst-case" upset would be a release that produces a large aerosol cloud with flammable properties. If the flammable cloud does not ignite after dispersion, the cloud would simply dissipate. If the flammable cloud were to ignite during the release, a flash fire or vapor cloud explosion could occur. If the flammable cloud were to ignite immediately upon release, a torch fire would ensue.

- **Thermal Radiation:** Thermal radiation is the heat generated by a fire and the potential impacts associated with exposure. Exposure to thermal radiation would result in burns, the severity of which would depend on the intensity of the fire, the duration of exposure, and the distance of an individual to the fire.

- **Explosion/Overpressure:** Process vessels containing flammable explosive vapors and potential ignition sources are present at many types of industrial facilities. Explosions may occur if the flammable/explosive vapors came into contact with an ignition source. An explosion could cause impacts to individuals and structures in the area due to overpressure.

For all affected facilities, risks to the public are reduced if there is a buffer zone between industrial processes and residences or other sensitive land uses, or the prevailing wind blows away from residential areas and other sensitive land uses. The risks posed by operations at each facility are unique and determined by a variety of factors. The areas affected by the rules are typically located in industrial areas.

Regulatory Background

There are many federal and state rules and regulations that facilities handling hazardous materials must comply with which serve to minimize the potential impacts associated with hazards at these facilities.

Under the Occupational Safety and Health Administration (OSHA) regulations [29 Code of Federal Regulations (CFR) Part 1910], facilities which use, store, manufacture, handle, process, or move highly hazardous materials must prepare a fire prevention plan. In addition, 29 CFR Part 1910.119, Process Safety Management (PSM) of Highly Hazardous Chemicals, and Title 8 of the California Code of Regulations, General Industry Safety Order §5189, specify required prevention program elements to protect workers at facilities that handle toxic, flammable, reactive, or explosive materials.

Section 112 (r) of the Clean Air Act Amendments of 1990 [42 U.S.C. 7401 et. Seq.] and Article 2, Chapter 6.95 of the California Health and Safety Code require facilities that handle listed regulated substances to develop Risk Management Programs (RMPs) to prevent accidental releases of these substances, U.S. EPA regulations are set forth in 40 CFR Part 68. In California, the California Accidental Release Prevention (CalARP) Program regulation (CCR Title 19, Division 2, Chapter 4.5) was issued by the Governor's Office of Emergency Services (OES). RMPs consist of three main elements: a hazard assessment that includes off-site consequences analyses and a five-year accident history, a prevention program, and an emergency response program. California is proposing modifications to the CalARP Program along with the state's PSM program in response to an accident at the Chevron Richmond Refinery. The regulations were released for public comment on July 15, 2016 and the public comment period closes on September 15, 2016.

Affected facilities that store materials are required to have a Spill Prevention Control and Countermeasures (SPCC) Plan per the requirements of 40 Code of Federal Regulations, §112. The SPCC is designed to prevent spills from on-site facilities (e.g., storage tanks) and includes requirements for secondary containment, provides emergency response procedures, establishes training requirements, and so forth.

The Hazardous Materials Transportation (HMT) Act is the federal legislation that regulates transportation of hazardous materials. The primary regulatory authorities are the U.S. Department of Transportation, the Federal Highway Administration, and the Federal Railroad Administration. The HMT Act requires that carriers report accidental releases of hazardous materials to the Department of Transportation at the earliest practical moment (49 CFR Subchapter C). The California Department of Transportation (Caltrans) sets standards for trucks in California. The regulations are enforced by the California Highway Patrol.

California Assembly Bill 2185 requires local agencies to regulate the storage and handling of hazardous materials and requires development of a business plan to mitigate the release of hazardous materials. Businesses that handle any of the specified hazardous materials must submit to government agencies (i.e., fire departments), an inventory of the hazardous materials, an emergency response plan, and an employee training program. The information in the business plan can then be used in the event of an emergency to determine the appropriate response action, the need for public notification, and the need for evacuation.

Contra Costa County has adopted an industrial safety ordinance that addresses the human factors that lead to accidents. The ordinance requires stationary sources to develop a written human factors program that considers human factors as part of process hazards analyses, incident investigations, training, operating procedures, among others.

Discussion of Impacts

VIII. a, b, and c).

Rule 11-18: Rule 11-18 has the potential to create direct or indirect hazard impacts associated with affected facility modifications employed to reduce risks. The rule is designed to reduce health risk associated with the emissions of TACs from existing stationary sources in the Bay Area. The rule is not expected to require substantial new development. Any new air pollution control equipment or enclosures would be expected to occur within existing commercial or industrial facilities. The rule is expected to increase the control and capture of TACs, thus limiting TAC emissions and exposure to TACs and ultimately, reduce health risks.

Facility modifications associated with the rule are largely expected to include limiting throughput or hours of operations; increased use of diesel particulate filters; additional enclosures and bag houses, and thermal oxidizers or carbon adsorption systems. The hazards associated with the use of these types of air pollution control equipment and systems are minimal.

- Limiting throughput or hours of operations would not result in increased hazards as no new equipment, hazardous materials uses, or hazards would be generated.
- Diesel particulate filters and baghouses are not expected to result in additional hazards as they would simply filter exhaust.

Operation of carbon adsorption systems has potential hazards associated with the desorption cycle when there is minor risk for explosion or release of VOC into the atmosphere. Carbon adsorption systems may also represent a fire risk during operation when carbon particles are saturated with volatile organic compounds. The potential hazard impacts would depend on the flammability of the material, concentration of VOC adsorbed into the activated carbon, ambient oxygen levels, characteristics of the carbon adsorption system, and the operating conditions. Carbon adsorption units would concentrate hazardous organic compound into the spent carbon, requiring recycling or disposal.

The risk of explosion or release of VOC from carbon adsorption systems is not expected to be significant. The engineering specifications for a carbon adsorption unit are typically designed to operate within an acceptable range of temperatures for the carbon bed. Good engineering practice means this range of temperatures should not exceed the lower explosive limit (LEL) of the compound(s) being adsorbed. There is little risk of fire if the LEL is not exceeded.

Oxidation systems can be susceptible to compressor failure and flame flashbacks, particularly during startup and shutdown. As a result, oxidation systems could pose potential hazard risks primarily to workers or to a lesser extent the public in the event of explosions or fires. Oxidation systems historically have a good safety record when operated properly according to the manufacturers' instruction. Proper tune-up and maintenance is also important and necessary to avoid failures or explosions. When installed, operated, and maintained properly, oxidation systems are not expected to create fire or explosion hazards to workers or the public in general.

In addition to following good engineering practice for both oxidization systems, thermal oxidizers and carbon adsorption systems, Health and Safety Code §25506 specifically requires all businesses handling hazardous materials to submit a business emergency response plan to assist local administering agencies in the event of an emergency release or threatened release of a hazardous material. Business emergency response plans generally require the following:

- Types and quantities of hazardous materials used and their locations;
- Training programs for employees including safe handling of hazardous materials and emergency response procedures and resources.

- Procedures for emergency response notification;
- Proper use of emergency equipment;
- Procedures to mitigate a release or threatened release of hazardous materials and measures to minimize potential harm or damage to individuals, property, or the environment; and
- Evacuation plans and procedures.

Hazardous materials are expected to be used in compliance with established OSHA or Cal/OSHA regulations and procedures, including providing adequate ventilation, using recommended personal protective equipment and clothing, posting appropriate signs and warnings, and providing adequate worker health and safety training. The exposure of employees is regulated by Cal-OSHA in Title 8 of the CCR. Specifically, 8 CCR 5155 establishes permissible exposure levels (PELs) and short-term exposure levels (STELs) for various chemicals. These requirements apply to all employees. The PELs and STELs establish levels below which no adverse health effects are expected. These requirements protect the health and safety of the workers, as well as the nearby population including sensitive receptors.

In general, all local jurisdictions and all facilities using a minimum amount of hazardous materials are required to formulate detailed contingency plans to eliminate, or at least minimize, the possibility and effect of fires, explosion, or spills. In conjunction with the California Office of Emergency Services, local jurisdictions have enacted ordinances that set standards for area and business emergency response plans. These requirements include immediate notification, mitigation of an actual or threatened release of a hazardous material, and evacuation of the emergency area.

The above regulations provide comprehensive measures to reduce hazards of explosive or otherwise hazardous materials. Compliance with these and other federal, state and local regulations and proper operation and maintenance of equipment should ensure the potential for explosions or accidental releases of hazardous materials is not significant. Therefore, the rule is not expected to create a significant hazard to the public or environment.

Schools may be located within a quarter mile of commercial, industrial or institutional facilities affected by Rule 11-18. It would be expected that these facilities are taking the appropriate and required actions to ensure proper handling or hazardous materials, substances or wastes near school sites. The rule would not generate hazardous emissions, handling of hazardous or acutely hazardous materials, substances or waste within one-quarter mile of an existing or proposed school. Rather, the rule would be more likely to control TACs from existing facilities near school sites. Therefore, no increase in hazardous emissions from implementation of Rule 11-18 would be expected.

Rule 12-16: Rule 12-16 has the potential to create direct or indirect hazard impacts associated with refinery modifications. The requirement to limit refinery emissions of certain pollutants could result in additional construction activities at the refineries, refinery modifications, and/or changes in refinery operations. Some refinery modifications and changes in operations could generate additional hazard impacts. In particular, NOx emission reduction measures could result in the increased use of ammonia, which is a hazardous material, in selective catalytic reduction (SCR) units. These potential hazard impacts will be further evaluated in the Draft EIR.

VIII. d). Government Code §65962.5 requires creation of lists of facilities that may be subject to Resource Conservation and Recovery Act (RCRA) permits or site cleanup activities.

Rule 11-18: It is not known if the affected commercial or industrial facilities are located on the hazardous materials sites list pursuant to Government Code §65962.5. However, the rule is expected to increase the control of TAC emissions and would not interfere with site cleanup activities or create additional site contamination, and would not create a significant hazard to the public or environment.

Rule 12-16: The refineries affected by the rule may be located on the hazardous materials sites list pursuant to Government Code §65962.5. The refineries would be required to manage any and all hazardous materials in accordance with federal, state and local regulations. Rule 12-16 is not expected to interfere with site cleanup activities or create additional site contamination. Therefore, this topic is less than significant and will not be further evaluated in the Draft EIR.

VIII. e and f).

Rules 11-18 and 12-16: Neither rule is expected to result in a safety hazard for people residing or working within two miles or a public airport or air strip. No impacts on airports or airport land use plans are anticipated from the rules, which are expected to increase the control of criteria and toxic pollutant emissions. Modifications are expected to be confined to the existing commercial or industrial land uses. Therefore, no significant adverse impacts on an airport land use plan or on a private air strip are expected.

VIII. g). Rules 11-18 and 12-16: No impacts on emergency response plans are anticipated from Rule 11-18 and Rule 12-16 that would apply to existing facilities (including refineries, etc.). The facilities affected by the rules already exist and operate within the confines of existing industrial facilities. The rules neither require, nor are likely to result in, activities that would impact any emergency response plan. The existing facilities affected by the rules already store and transport hazards materials, so emergency response plans already include hazards associated with existing refinery operations. The rules are not expected to require any changes in emergency response planning. Therefore, no significant adverse impacts on emergency response plans are expected.

VIII. h). Rules 11-18 and 12-16: No increase in hazards associated with wildfires is anticipated from Rule 11-18 or Rule 12-16. The existing facilities (including petroleum refineries, etc.) affected by the rules already exist and operate within the confines of existing commercial or industrial facilities. Native vegetation has been removed from the operating portions of the affected facilities to minimize fire hazards. Neither Rule 11-18 nor Rule 12-16 is expected to increase the risk of hazards associated with wildland fires in general and specifically in areas with flammable materials. Therefore, neither Rule 11-18 nor Rule 12-16 would expose people or structures to significant risk of loss, injury or death involving wildland fires.

Conclusions

Rule 11-18: Based upon these considerations, no significant adverse hazards and hazardous materials impacts are expected from the implementation of Rule 11-18.

<u>Rule 12-16</u>: Based upon the above considerations, the potential refinery hazards that may be introduced due to compliance with Rule 12-16 will be evaluated in the Draft EIR (VIII. a, b, and c). No significant hazard impacts on sites listed pursuant to Government Code §65962.5, public airports or airstrips, emergency response plans or hazards associated with wildfires are expected, and these topics will not be addressed further in the Draft EIR.

IX. HYDROLOGY AND WATER QUALITY.

Would the project:	Potentially Significant Impact	Less Than Significant Impact with Mitigation Incorporated	Less-than-Significant Impact	No Impact
a) Violate any water quality standards or waste discharge requirements?				
Rule 11-18	☐	☐	☑	☐
Rule 12-16	☑	☐	☐	☐
b) Substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level (e.g. the production rate of pre-existing nearby wells would drop to a level that would not support existing land uses or planned uses for which permits have been granted)?				
Rule 11-18	☐	☐	☑	☐
Rule 12-16	☑	☐	☐	☐
c) Substantially alter the existing drainage pattern of the site or area, including through alteration of the course of a stream or river, in a manner that would result in substantial erosion or siltation onsite or offsite?				
Rule 11-18	☐	☐	☐	☑
Rule 12-16	☐	☐	☐	☑
d) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner that would result in flooding onsite or offsite?				
Rule 11-18	☐	☐	☐	☑
Rule 12-16	☐	☐	☐	☑
e) Create or contribute runoff water that would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff?				
Rule 11-18	☐	☐	☐	☑
Rule 12-16	☐	☐	☐	☑
f) Otherwise substantially degrade water quality?				
Rule 11-18	☐	☐	☑	☐
Rule 12-16	☑	☐	☐	☐

Would the project:	Potentially Significant Impact	Less Than Significant Impact with Mitigation Incorporated	Less-than-Significant Impact	No Impact
g) Place housing within a 100-year flood hazard area, as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map?				
Rule 11-18	☐	☐	☐	☑
Rule 12-16	☐	☐	☐	☑
h) Place within a 100-year flood hazard area structures that would impede or redirect flood flows				
Rule 11-18	☐	☐	☐	☑
Rule 12-16	☐	☐	☐	☑
i) Expose people or structures to a significant risk of loss, injury or death involving flooding, including flooding as a result of the failure of a levee or dam?				
Rule 11-18	☐	☐	☐	☑
Rule 12-16	☐	☐	☐	☑
j) Inundation by seiche, tsunami, or mudflow?				
Rule 11-18	☐	☐	☐	☑
Rule 12-16	☐	☐	☐	☑

Setting

The BAAQMD covers all of Alameda, Contra Costa, Marin, San Francisco, San Mateo, Santa Clara, and Napa Counties and portions of southwestern Solano and southern Sonoma Counties. The area of coverage is vast (about 5,600 square miles), so that land uses and affected environment vary substantially throughout the area and include commercial, industrial, residential, agricultural, and open space uses.

The facilities affected by the rule are located within all counties under the jurisdiction of the BAAQMD. Affected areas are generally surrounded by other industrial or commercial facilities. Reservoirs and drainage streams are located throughout the area and discharge into the Bays. Marshlands incised with numerous winding tidal channels containing brackish water are located throughout the Bay Area.

The affected areas are located within the San Francisco Bay Area Hydrologic Basin. The primary regional groundwater water-bearing formations include the recent and Pleistocene (up to two million years old) alluvial deposits and the Pleistocene Huichica formation. Salinity within the unconfined alluvium appears to increase with depth to at least 300 feet. Water of the Huichica formation tends to be soft and relatively high in bicarbonate, although usable for domestic and irrigation needs.

Regulatory Background

The Federal Clean Water Act of 1972 primarily establishes regulations for pollutant discharges into surface waters in order to protect and maintain the quality and integrity of the nation's waters. This Act requires industries that discharge wastewater to municipal sewer systems to meet pretreatment standards. The regulations authorize the U.S. EPA to set the pretreatment standards. The regulations also allow the local treatment plants to set more stringent wastewater discharge requirements, if necessary, to meet local conditions.

The 1987 amendments to the Clean Water Act enabled the U.S. EPA to regulate, under the National Pollutant Discharge Elimination System (NPDES) program, discharges from industries and large municipal sewer systems. The U.S. EPA set initial permit application requirements in 1990. The State of California, through the State Water Resources Control Board, has authority to issue NPDES permits, which meet U.S. EPA requirements, to specified industries.

The Porter-Cologne Water Quality Act is California's primary water quality control law. It implements the state's responsibilities under the Federal Clean Water Act but also establishes state wastewater discharge requirements. The Regional Water Quality Control Boards (RWQCB) administer the state requirements as specified under the Porter-Cologne Water Quality Act, which include storm water discharge permits. The water quality in the Bay Area is under the jurisdiction of the San Francisco Bay Regional Water Quality Control Board.

In response to the Federal Act, the State Water Resources Control Board adopted the State Water Resources Control Plan for the San Francisco Bay/Sacramento-San Joaquin Delta Estuary in 2006. San Francisco Bay and its constituent parts, including Carquinez Strait and Suisun Bay, are considered to be enclosed bays (indentations along the coast that enclose an area of oceanic water within distinct headlands or harbors). The Plan consists of: (1) beneficial uses to be protected; (2) water quality objectives for the reasonable protection of beneficial uses; and (3) a program of implementation for achieving the water quality objectives. Together, the beneficial uses and the water quality objectives established to reasonably protect the beneficial uses are called water quality standards under the terminology of the federal Clean Water Act. The beneficial uses of the Carquinez Strait that must be protected include: municipal and domestic water supply systems, industrial service supply systems, agricultural supply systems, ground water recharge, navigation, water contact and non-contact recreation, shell fish harvesting, commercial and sport fishing, cold freshwater habitat, migration of aquatic organisms, spawning reproduction and early development, wildlife habitat, estuarine habitat, and preservation of rare, threatened. and endangered species.

Discussion of Impacts

IX. a, b, and f).

Rule 11-18: The rule is designed to reduce risk from existing stationary sources located throughout the Bay Area. Potential risk reduction measures include measures that would limit emissions of TACs. The rule is not expected to require any new development. Modifications are expected to be limited to existing commercial or industrial facilities. Physical changes are expected to be limited to new air pollution control equipment and construction of enclosures. No significant increase in wastewater discharge is expected from the project, and therefore no impacts on water quality resources are anticipated from the rule.

Minor construction may be necessary to install control systems. Construction would likely require a couple of pieces of off-road equipment, medium-duty truck trips to deliver equipment, and a small construction crew. The construction of enclosures may require some grading and foundations work. Grading and foundation work is not expected to last more than one week per project, therefore, minimal water will be required for dust mitigation. No wet gas scrubbers are expected as a result of the rule. All existing and new facilities will still be required to have applicable wastewater discharge permits and storm water pollution prevention plans (SWPPP).

No significant increase in water use is expected as a result of the rule. The Air District anticipates that facilities will implement various control measures, but no wet gas scrubbers are expected. Thus, water concerns will be limited to construction, which is expected to involve minor construction activities within existing facilities or buildings. Minor water use for construction purposes will not substantially increase water demand or interfere with groundwater recharge or cause any notable change in the groundwater table level.

Rule 12-16: Rule 12-16 could require the installation of additional air pollution control equipment or modify refinery operations. The rule could require new construction activities and the operation of new/modified refinery equipment. The goal of Rule 12-16 is to limit overall refinery emissions of certain pollutants, however, refinery modifications could result in the increased use of water. For example, control measures for particulate matter and/or SOx emissions could require additional water use and wastewater discharge from devices like wet gas scrubbers. The potential increase and water use and the potential to deplete groundwater supplies will be evaluated in the Draft EIR.

IX. c, d, and e).

Rule 11-18: The rule does not have the potential to substantially increase the area subject to runoff since the construction activities are expected to be limited in size and would be located primarily within existing facilities that have already been graded. Additionally, facilities are typically expected to develop a SWPPP to address storm water impacts. Rule 11-18 is also not expected to substantially alter the existing drainage or drainage patterns, result in erosion or siltation, alter the course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner that would result in flooding onsite or offsite as there will be no major construction or significant water use. Therefore, no significant adverse impacts to storm water runoff or existing drainage patterns are expected as a result of the rule.

Rule 12-16: Rule 12-16 would limit the emissions of certain air pollutant and could require the installation of additional air pollution control equipment or modify refinery operations if those thresholds are exceeded. The rule does not have the potential to substantially increase the area subject to runoff since the construction activities are expected to be limited in size and would be located within existing refineries that have already been graded and developed. In addition, storm water drainage within refineries has been controlled and construction activities are not expected to alter the storm water drainage within the refineries. Therefore, the rule is not expected to substantially alter the existing drainage or drainage patterns, result in erosion or siltation, alter the course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner that would result in flooding onsite or offsite. Additionally, the rule is not expected to create or contribute to runoff water that would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of contaminated runoff. Therefore, no significant adverse impacts to storm water runoff are expected, and it will not be further evaluated in the Draft EIR.

IX. g, h, i, and j): Rules 11-18 and 12-16: Neither of the rules include the construction of new or relocation of existing housing or other types of facilities and, as such, would not require the placement of housing or other structures within a 100-year flood hazard area. (See also XIII "Population and Housing"). As a result, the rules would not be expected to create or substantially increase risks from flooding; expose people or structures to significant risk of loss, injury or death involving flooding; or increase existing risks, if any, of inundation by seiche, tsunami, or mudflow. Consequently, this topic will not be evaluated further in the Draft EIR.

Conclusions

Rule 11-18: Based upon these considerations, no significant adverse impacts to hydrology and water quality are expected from the adoption of the rule.

Rule 12-16: The potential increase in water use and the potential to deplete groundwater supplies will be evaluated in the Draft EIR. No significant adverse water quality impacts were identified for stormwater runoff, flood hazards, or inundation hazards and these topics will not be addressed in the Draft EIR.

X. LAND USE AND PLANNING.

Would the project:	Potentially Significant Impact	Less Than Significant Impact with Mitigation Incorporated	Less-than-Significant Impact	No Impact
a) Physically divide an established community?				
Rule 11-18	☐	☐	☐	☑
Rule 12-16	☐	☐	☐	☑
b) Conflict with any applicable land use plan, policy, or regulation of an agency with jurisdiction over the project (including, but not limited to a general plan, specific plan, local coastal program or zoning ordinance) adopted for the purpose of avoiding or mitigating an environmental effect?				
Rule 11-18	☐	☐	☐	☑
Rule 12-16	☐	☐	☐	☑
c) Conflict with any applicable habitat conservation plan or natural community conservation plan?				
Rule 11-18	☐	☐	☐	☑
Rule 12-16	☐	☐	☐	☑

Setting

The BAAQMD covers all of Alameda, Contra Costa, Marin, San Francisco, San Mateo, Santa Clara, and Napa Counties and portions of southwestern Solano and southern Sonoma Counties. The area of coverage is vast (about 5,600 square miles), so that land uses vary greatly and include commercial, industrial, residential, agricultural, and open space uses. The facilities affected by the rules are primarily located in commercial and industrial areas throughout the Bay Area.

Regulatory Background

Land uses are generally protected and regulated by the City and/or County General Plans through land use and zoning requirements.

Discussion of Impacts

X. a, b, and c)

Rule 11-18: The rule is designed to reduce risk from existing stationary sources located throughout the Bay Area. Potential risk reduction measures include measures that would limit emissions of TACs. The rule does not include any components that would require major modifications to existing commercial or industrial facilities and therefore the rule would not result in impacts that would physically divide an established community or generate additional development.

The rule is not expected to require any new substantial construction or development. New or modified pollution control equipment or enclosures would be located within existing commercial or industrial facilities. Construction activities would be limited to the confines of existing facilities which are zoned for commercial or industrial land use. Modifications to equipment would be limited to the confines of existing facilities and are not expected to affect adjacent land uses, divide an established community, conflict with any applicable land use plan or policy or conflict with any habitat conservation plan.

Rule 12-16: Construction activities could also be required to install air pollution control equipment associated with compliance with Rule 12-16. Any substantial construction activities associated with new refinery equipment would occur within the confines of existing refineries. The land use within the refineries is typically zoned for heavy industrial uses. Land uses surrounding the refineries can vary considerably and include industrial areas, commercial areas, open space, and residential areas. Construction activities would be limited to the confines of the refineries. The installation of air monitors or air pollution control equipment would not change or impact existing land uses.

Conclusions

Based upon the above considerations, significant adverse project-specific impacts to land use and planning are not expected to occur due to implementation of either Rule 11-18 or Rule 12-16 and, therefore, will not be further evaluated in the Draft EIR.

XI. MINERAL RESOURCES.

Would the project:	Potentially Significant Impact	Less Than Significant Impact with Mitigation Incorporated	Less-than-Significant Impact	No Impact
a) Result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state?				
Rule 11-18	☐	☐	☐	☑
Rule 12-16	☐	☐	☐	☑
b) Result in the loss of availability of a locally important mineral resource recovery site delineated on a local general plan, specific plan, or other land use plan?				
Rule 11-18	☐	☐	☐	☑
Rule 12-16	☐	☐	☐	☑

Setting

The BAAQMD covers all of Alameda, Contra Costa, Marin, San Francisco, San Mateo, Santa Clara, and Napa Counties and portions of southwestern Solano and southern Sonoma Counties. The area of coverage is vast (about 5,600 square miles) so that land uses and the affected environment vary greatly throughout the area. The facilities affected by the Rules 11-18 and 12-16 are primarily located in commercial and industrial areas within the Bay Area.

Regulatory Background

Mineral resources are generally protected and regulated by the City and/or County General Plans through land use and zoning requirements.

Discussion of Impacts

XI. a, and b).

Rule 11-18: Rule 11-18 is designed to reduce risk from existing stationary sources located throughout the Bay Area. Potential risk reduction measures include measures that would limit emissions of TACs. The rule is not associated with any action that would result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state, or of a locally important mineral resource recovery site delineated on a local general plan, specific plan or other land use plan. Therefore, no impacts on mineral resources are expected.

Rule 12-16: Rule 12-16 would limit the emissions of certain air pollutant and could require the installation of additional air pollution control equipment or modify refinery operations if those thresholds are exceeded. The rule is not associated with any action that would result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state, or of a locally important mineral resource recovery site delineated on a local general plan, specific plan or other land use plan. Therefore, no impacts on mineral resources are expected.

Conclusions

Based upon the above considerations, significant adverse project-specific impacts to mineral resources are not expected to occur due to implementation of either Rule 11-18 or Rule 12-16 and, therefore, will not be further evaluated in the Draft EIR.

XII. NOISE.

Would the project:	Potentially Significant Impact	Less Than Significant Impact with Mitigation Incorporated	Less-than-Significant Impact	No Impact
a) Exposure of persons to or generate noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?				
Rule 11-18	☐	☐	☑	☐
Rule 12-16	☐	☐	☑	☐
b) Exposure of persons to or generation of excessive groundborne vibration or groundborne noise levels?				
Rule 11-18	☐	☐	☑	☐
Rule 12-16	☐	☐	☑	☐
c) A substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project?				
Rule 11-18	☐	☐	☑	☐
Rule 12-16	☐	☐	☑	☐
d) A substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project?				
Rule 11-18	☐	☐	☑	☐
Rule 12-16	☐	☐	☑	☐
e) For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport would the project expose people residing or working in the project area to excessive noise levels?				
Rule 11-18	☐	☐	☐	☑
Rule 12-16	☐	☐	☐	☑
f) For a project within the vicinity of a private airstrip would the project expose people residing or working in the project area to excessive noise levels?				
Rule 11-18	☐	☐	☐	☑
Rule 12-16	☐	☐	☐	☑

Setting

The BAAQMD covers all of Alameda, Contra Costa, Marin, San Francisco, San Mateo, Santa Clara, and Napa Counties and portions of southwestern Solano and southern Sonoma Counties. The area of coverage is vast (about 5,600 square miles) so that land uses and the affected environment vary greatly throughout the area. The facilities affected by the rules are located in commercial and industrial areas of the Bay Area.

Regulatory Background

Noise issues related to construction and operation activities are addressed in local General Plan policies and local noise ordinance standards. The General Plans and noise ordinances generally establish allowable noise limits within different land uses including residential areas, other sensitive use areas (e.g., schools, churches, hospitals, and libraries), commercial areas, and industrial areas.

Discussion of Impacts

XII. a, b, c, and d).

Rule 11-18: Rule 11-18 is designed to reduce risk from existing stationary sources located throughout the Bay Area. Potential risk reduction measures include measures that would limit emissions of TACs. New modifications are expected to be limited to the commercial and industrial facilities. The existing noise environment at each of the affected facilities is typically dominated by noise from existing equipment onsite, vehicular traffic around the facilities, and trucks entering and exiting facility premises. No new major industrial equipment is expected to be required to be installed due to the rule so that no noise impacts associated with the operation of the rule are expected. Air pollution control equipment is not generally a major noise source. Further, all noise producing equipment must comply with local noise ordnances and applicable OSHA and Cal/OSHA noise requirements. Therefore, industrial operations affected by the rule are not expected to have a result in noise exposure that would exceed levels established by local noise control laws or ordinances.

Construction activities associated with the rule may generate some noise associated with temporary construction equipment and construction-related traffic. Construction would likely require truck trips to deliver equipment, a construction crew of up to about 15 workers, and a few pieces of construction equipment (e.g., forklift, welders, backhoes, cranes, and generators). All construction activities would be temporary and are expected to occur within the confines of existing commercial or industrial facilities so that no significant increase in noise is expected.

Rule 11-18 is not expected to generate or expose people to excessive groundborne vibration or groundborne noise. No major construction equipment that would generate vibration (e.g., backhoes, graders, jackhammers, etc.) is expected to be required. Therefore, the rule is not expected to generate excessive groundborne vibration or noise.

Rule 12-16: The petroleum refineries affected by Rule 12-16 already exist and operate within the confines of existing industrial facilities in the Bay Area. Any substantial construction activities associated with new refinery equipment would occur within the confines of existing refineries, located within industrial areas. However, those construction activities would be required to comply with local noise ordinances, which generally prohibit construction during the nighttime, in order to minimize noise impacts. Compliance with the local noise ordinances is expected to minimize noise impacts associated with construction activities to less than significant.

Ambient noise levels in industrial areas are typically driven primarily by freeway and/or highway traffic in the area and any heavy-duty equipment used for materials manufacturing or processing. It is not expected that any modifications to install air pollution control equipment would substantially increase ambient (operational) noise levels in the area, either permanently or intermittently, or expose people to excessive noise levels that would be noticeable above and beyond existing ambient levels. It is not expected that affected facilities would exceed noise standards established in local general plans, noise elements, or noise ordinances currently in effect. Affected refineries would be required to comply with local noise ordinances and elements, which may require construction of noise barriers or other noise control devices.

It is also not anticipated that the rule will cause an increase in groundborne vibration levels because air pollution control equipment is not typically vibration intensive equipment. Consequently, Rule 12-16 is not expected to directly or indirectly cause substantial noise or excessive ground borne vibration impacts. These impacts, therefore, will not be further evaluated in the Draft EIR.

XII. e and f).

Rule 11-18: It is not known if the existing commercial or industrial facilities affected by the rule are located within existing airport land use plans. The addition of new or modification of existing air pollution control equipment or enclosures would not expose people residing or working in the project area to excessive noise levels associated with airports, as air pollution control equipment are not typically noise generating equipment. Rule 11-18 would not locate residents or commercial buildings or other sensitive noise sources closer to airport operations. As noted in the previous item, there are no components of the rule that would substantially increase ambient noise levels, either intermittently or permanently.

Rule 12-16: If applicable, the petroleum refineries affected by Rule 12-16 would still be expected to comply, and not interfere, with any applicable airport land use plans. The existing refineries are not located within existing airport land use plans. Rule 12-16 would not locate residents or commercial buildings or other sensitive noise sources closer to airport operations. As noted in the previous item, there are no components of the rule that would substantially increase ambient noise levels, either intermittently or permanently.

Conclusions

Based upon the above considerations, no significant adverse project-specific noise impacts are expected due to implementation of either Rule 11-18 or Rule 12-16; therefore, noise impacts will not be further evaluated in the Draft EIR.

XIII. POPULATION AND HOUSING.

Would the project:	Potentially Significant Impact	Less Than Significant Impact with Mitigation Incorporated	Less-than-Significant Impact	No Impact
a) Induce substantial population growth in an area either directly (e.g., by proposing new homes and businesses) or indirectly (e.g. through extension of roads or other infrastructure)?				
Rule 11-18	☐	☐	☐	☑
Rule 12-16	☐	☐	☐	☑
b) Displace a substantial number of existing housing units, necessitating the construction of replacement housing elsewhere?				
Rule 11-18	☐	☐	☐	☑
Rule 12-16	☐	☐	☐	☑
c) Displace a substantial number of people, necessitating the construction of replacement housing elsewhere?				
Rule 11-18	☐	☐	☐	☑
Rule 12-16	☐	☐	☐	☑

Setting

The BAAQMD covers all of Alameda, Contra Costa, Marin, San Francisco, San Mateo, Santa Clara, and Napa Counties and portions of southwestern Solano and southern Sonoma Counties. The area of coverage is vast (about 5,600 square miles) so that land uses and the affected environment vary greatly throughout the area. The facilities affected by the Rules 11-18 and 12-16 are generally industrial and commercial facilities within the jurisdiction of the BAAQMD.

Regulatory Background

Population and housing growth and resources are generally protected and regulated by the City and/or County General Plans through land use and zoning requirements.

Discussion of Impacts

XIII. a). According to the Association of Bay Area Governments (ABAG), population in the Bay Area is currently about seven million people and is expected to grow to about nine million people by 2035 (ABAG, 2006).

Rule 11-18: Rule 11-18 is not anticipated to generate any significant effects, either directly or indirectly, on the Bay Area's population or population distribution. The rule would affect commercial and industrial facilities. It is expected that the existing labor pool would accommodate the labor requirements for any new or modified equipment at the facilities. In addition, it is not expected that the affected facilities would need to hire additional personnel to implement the rule. In the event that new employees are hired, it is expected that the existing local labor pool in the Bay Area can accommodate any increase in demand for workers that might occur as a result of adopting the rule. As such, adopting propose Rule 11-18 is not expected to induce substantial population growth.

Rule 12-16: Rule 12-16 is not anticipated to generate any significant effects, either directly or indirectly, on the Bay Area's population or population distribution. The rule would affect five refineries and three associated facilities located in Contra Costa and Solano counties. It is expected that the existing labor pool would accommodate the labor requirements for any modifications at the affect refineries. In addition, it is not expected that the affected refineries would need to hire additional personnel to operate and maintain new control equipment on site because air pollution control equipment is typically not labor intensive equipment. In the event that new employees are hired, it is expected that the existing local labor pool in the Bay Area can accommodate any increase in demand for workers that might occur as a result of adopting the rule. As such, adopting Rule 12-16 is not expected to induce substantial population growth.

XIII. b and c). Rules 11-18 and 12-16: Both of the rules could result in the installation of air pollution control equipment operated in commercial and industrial settings. However, Rules 11-18 and 12-16 are not expected to result in the creation of any industry that would affect population growth, directly or indirectly induce the construction of single- or multiple-family units, or require the displacement of people or housing elsewhere in the Bay Area. Based upon these considerations, significant population and housing impacts are not expected from the implementation of the rules.

Conclusions

Based upon the above considerations, significant adverse project-specific impacts to population and housing are not expected to occur due to implementation of either Rule 11-18 or Rule 12-16 and, therefore, will not be further evaluated in the Draft EIR.

XIV. PUBLIC SERVICES.

Would the project:	Potentially Significant Impact	Less Than Significant Impact with Mitigation Incorporated	Less-than-Significant Impact	No Impact
a) Result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities or a need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times, or other performance objectives for any of the following public services:				
Fire protection?				
Rule 11-18	☐	☐	☐	☑
Rule 12-16	☐	☐	☐	☑
Police protection?				
Rule 11-18	☐	☐	☐	☑
Rule 12-16	☐	☐	☐	☑
Schools?				
Rule 11-18	☐	☐	☐	☑
Rule 12-16	☐	☐	☐	☑
Parks?				
Rule 11-18	☐	☐	☐	☑
Rule 12-16	☐	☐	☐	☑
Other public facilities?				
Rule 11-18	☐	☐	☐	☑
Rule 12-16	☐	☐	☐	☑

Setting

The BAAQMD covers all of Alameda, Contra Costa, Marin, San Francisco, San Mateo, Santa Clara, and Napa Counties and portions of southwestern Solano and southern Sonoma Counties. The area of coverage is vast (about 5,600 square miles) so that land uses and the affected environment vary greatly throughout the area. The facilities affected by the rules are primarily located in commercial and industrial areas within the Bay Area.

Given the large area covered by the BAAQMD, public services are provided by a wide variety of local agencies. Fire protection and police protection/law enforcement services within the BAAQMD are provided by various districts, organizations, and agencies. There are several school districts, private schools, and park departments within the BAAQMD. Public facilities within the BAAQMD are managed by different county, city, and special-use districts. All refineries affected by the rules maintain fire-fighting equipment and trained personnel with fire-fighting and emergency response experience. In addition, all affected refineries operated on-site security systems.

Regulatory Background

City and/or County General Plans usually contain goals and policies to assure adequate public services are maintained within the local jurisdiction.

Discussion of Impacts

XIV. a).

Rule 11-18: The rule is designed to reduce toxic health risks from stationary sources in the Bay Area. Rule 11-18 could require minor construction activities and modifications at existing facilities. The modifications are not expected to require additional service from local fire or police departments above current levels.

As noted in the "Population and Housing" discussion above, the rule is not expected to induce population growth because the local labor pool (e.g., workforce) is expected to be sufficient to accommodate any activities that may be necessary at affected facilities. Additionally, modifications to existing facilities are not expected to require an increase in employees. Therefore, there will be no increase in local population and thus no impacts are expected to local schools or parks.

The rule would not result in the need for new or physically altered government facilities in order to maintain acceptable service ratios, response times, or other performance objectives. There will be no increase in population as a result of the adoption of the rule, therefore, no need for physically altered government facilities.

Rule 12-16: Rule 12-16 would limit the emissions of certain air pollutant and could require the installation of additional air pollution control equipment or modify refinery operations if those thresholds are exceeded. As stated above, all refineries affected by the rule, maintain on-site fire-fighting equipment and trained personnel with fire-fighting and emergency response experience. While Rule 12-16 could require new construction activities and the operation of new/modified refinery equipment, the additional equipment is not expected to require additional service from local fire departments above current levels.

Refineries maintain their own security systems. Refineries are fenced and access is controlled at manned gates. Modification associated with the rule would occur within the confines of the existing refineries. Therefore, the rule is not expected to increase the need or demand for additional police services above current levels.

As noted in the "Population and Housing" discussion above, the rule is not expected to induce population growth because the local labor pool (e.g., workforce) is expected to be sufficient to accommodate any activities that may be necessary at affected facilities. Additionally, operation of new air monitoring and air pollution control equipment is not expected to require a substantial increase in employees. Therefore, there will be no increase in local population and thus no impacts are expected to local schools or parks.

Conclusions

Based upon the above considerations, significant adverse project-specific impacts to public services are not expected to occur due to implementation of either Rule 11-18 or Rule 12-16 and, therefore, will not be further evaluated in the Draft EIR.

XV. RECREATION.

Would the project:	Potentially Significant Impact	Less Than Significant Impact with Mitigation Incorporated	Less-than-Significant Impact	No Impact
a) Would the project increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated?				
Rule 11-18	☐	☐	☐	☑
Rule 12-16	☐	☐	☐	☑
b) Does the project include recreational facilities or require the construction or expansion of recreational facilities that might have an adverse physical effect on the environment?				
Rule 11-18	☐	☐	☐	☑
Rule 12-16	☐	☐	☐	☑

Setting

The BAAQMD covers all of Alameda, Contra Costa, Marin, San Francisco, San Mateo, Santa Clara, and Napa Counties and portions of southwestern Solano and southern Sonoma Counties. The area of coverage is vast (about 5,600 square miles) so that there are numerous areas for recreational activities. The refineries affected by the Rules 11-18 and 12-16 are located in industrial areas within the Bay Area. Public recreational land can be located adjacent to, or in reasonable proximity to, these areas.

As noted in the "Population and Housing" discussion above, the rules are not expected to induce population growth because the local labor pool (e.g., workforce) is expected to be sufficient to accommodate any activities that may be necessary at affected facilities. Additionally, operation of new air pollution control equipment is not expected to require additional employees. Therefore, there will be no increase in local population and thus no impacts are expected to local schools or parks.

Regulatory Background

Recreational areas are generally protected and regulated by the City and/or County General Plans at the local level through land use and zoning requirements. Some parks and recreation areas are designated and protected by state and federal regulations.

Discussion of Impacts

XV. a and b). Rules 11-18 and 12-16: As discussed under "Land Use" above, there are no provisions of the rules that would affect land use plans, policies, or regulations. Land use and other planning considerations are determined by local governments; no land use or planning requirements will be altered by either Rule 11-18 or Rule 12-16. Air pollution control equipment, if necessary, would be installed within the confines of existing facilities, including refineries, and would not impact existing recreational facilities.

As noted in the "Population and Housing" discussion above, the rules are not expected to induce population growth because the local labor pool (e.g., workforce) is expected to be sufficient to accommodate any activities that may be necessary at affected facilities. Additionally, operation of new air pollution control equipment is not expected to require a substantial increase in employees. Therefore, there will be no increase in local population and thus no impacts are expected to local recreational facilities.

Conclusions

Based upon the above considerations, significant adverse project-specific impacts to recreation are not expected to occur due to implementation of either Rule 11-18 or Rule 12-16 and, therefore, will not be further evaluated in the Draft EIR.

XVI. TRANSPORTATION / TRAFFIC.

Would the project:	Potentially Significant Impact	Less Than Significant Impact with Mitigation Incorporated	Less-than-Significant Impact	No Impact
a) Conflict with an applicable plan, ordinance or policy establishing measures of effectiveness for the performance of the circulation system, taking into account all modes of transportation including mass transit and non-motorized travel and relevant components of the circulation system, including but not limited to intersections, streets, highways and freeways, pedestrian and bicycle paths, and mass transit?				
Rule 11-18	☐	☐	☑	☐
Rule 12-16	☐	☐	☐	☑
b) Conflict with an applicable congestion management program, including, but not limited to level of service standards and travel demand measures, or other standards established by the county congestion management agency for designated roads or highways?				
Rule 11-18	☐	☐	☑	☐
Rule 12-16	☐	☐	☐	☑
c) Result in a change in air traffic patterns, including either an increase in traffic levels or a change in location that results in substantial safety risks?				
Rule 11-18	☐	☐	☐	☑
Rule 12-16	☐	☐	☐	☑
d) Substantially increase hazards because of a design feature (e.g. sharp curves or dangerous intersections) or incompatible uses (e.g. farm equipment)?				
Rule 11-18	☐	☐	☐	☑
Rule 12-16	☐	☐	☐	☑
e) Result in inadequate emergency access?				
Rule 11-18	☐	☐	☐	☑
Rule 12-16	☐	☐	☐	☑
f) Conflict with adopted policies, plans or programs regarding public transit, bicycle, or pedestrian facilities, or otherwise decrease the performance or safety of such facilities?				
Rule 11-18	☐	☐	☐	☑
Rule 12-16	☐	☐	☐	☑

Setting

The BAAQMD covers all of Alameda, Contra Costa, Marin, San Francisco, San Mateo, Santa Clara, and Napa Counties and portions of southwestern Solano and southern Sonoma Counties. The area of coverage is vast (about 5,600 square miles). Transportation systems located within the Bay Area include railroads, airports, waterways, and highways. The Port of Oakland and three international airports in the area serve as hubs for commerce and transportation. The transportation infrastructure for vehicles and trucks in the Bay Area ranges from single lane roadways to multilane interstate highways. The Bay Area currently contains over 1,300 directional miles of limited-access highways, which include both interstates and state highways. In addition, the Bay Area has over 33,000 directional miles of arterials and local streets, providing more localized access to individual communities. Together, these roadway facilities accommodate nearly 17 million vehicle trips a day. There are over 11,500 transit route miles of service including heavy rail (BART), light rail (Muni Metro and VTA Light Rail), commuter rail (Caltrain and ACE), diesel and electric buses, cable cars, and ferries. The Bay Area also has an extensive local system of bicycle routes and pedestrian paths and sidewalks. At a regional level, the share of workers driving alone was about 68 percent in 2010. The portion of commuters that carpool was about 11 percent in 2010, while an additional 10 percent utilize public transit. About 3 percent of commuters walked to work in 2010. In addition, other modes of travel (bicycle, motorcycle, etc.), account for three percent of commuters in 2010 (MTC, 2013). Cars, buses, and commercial vehicles travel about 149 million miles a day (2010) on the Bay Area Freeways and local roads. Transit serves about 1.6 million riders on the average weekday (MTC, 2013).

The region is served by numerous interstate and U.S. freeways. On the west side of San Francisco Bay, Interstate 280 and U.S. 101 run north-south. U.S. 101 continues north of San Francisco into Marin County. Interstates 880 and 660 run north-south on the east side of the Bay. Interstate 80 starts in San Francisco, crosses the Bay Bridge, and runs northeast toward Sacramento. Interstate 80 is a six-lane north-south freeway which connects Contra Costa County to Solano County via the Carquinez Bridge. State Routes 29 and 84, both highways that allow at-grade crossings in certain parts of the region, become freeways that run east-west and cross the Bay. Interstate 580 starts in San Rafael, crosses the Richmond-San Rafael Bridge, joins with Interstate 80, runs through Oakland, and then runs eastward toward Livermore. From the Benicia-Martinez Bridge, Interstate 680 extends north to Interstate 80 in Cordelia. Interstate 780 is a four lane, east-west freeway extending from the Benicia-Martinez Bridge west to I-80 in Vallejo.

Regulatory Background

Transportation planning is usually conducted at the state and county level. Planning for interstate highways is generally done by Caltrans.

Most local counties maintain a transportation agency that has the duties of transportation planning and administration of improvement projects within the county and implements the Transportation Improvement and Growth Management Program, and the congestion management plans (CMPs). The CMP identifies a system of state highways and regionally significant principal arterials and specifies level of service standards for those roadways.

Discussion of Impacts

XVI. a and b).

Rule 11-18: Construction: The rule is designed to reduce health risks from stationary sources in the Bay Area. Any new or modified pollution control equipment is expected to be located in commercial, industrial, or institutional facilities and may require construction activities. Construction impacts were considered for the control measures found in Table 2-1. Control measures that do not require equipment, such as reducing operating time, are not expected to generate any additional traffic. The BAAQMD estimates that approximately 30 facilities per year are expected to meet reductions by implementing either a baghouse or an enclosure. The construction of enclosures is expected to require the most construction equipment and workers. This could require up to 34 delivery and/or disposal trucks and up to about 45 construction worker trips on a peak construction day (during the building construction phase for enclosures). Given the size of the Bay Area, this amount of construction traffic would not be noticeable, particularly since construction activities would be expected at existing commercial, industrial and institutional land uses and would be temporary. The rule is not expected to require modification to circulation for temporary construction activities. As a result, construction traffic from Rule 11-18 would not have significant impacts on the performance of the circulation system or on standards established for congestion management.

Operational: Waste products may be generated from the use of several types of control technologies. Wastes could include: spent carbon generated from the carbon adsorption process; spent metal catalysts from the catalytic oxidation process; and dry solids from filtration controls. The majority of wastes will likely need to be transported to disposal or recycling facilities. The catalysts in catalytic oxidizers need to be replaced every few years so this potential waste product was considered to contribute to the waste transport impacts.

For a “worst case” analysis, it was assumed that about 180 facilities per year would be required to install a control device to comply with the rule. These facilities at any given day would generate an additional one-two truck trips per day in the entire Air District for delivery and disposal. These potential truck trips are not expected to significantly adversely affect circulation patterns on local roadways near affected facilities. In addition, this volume of additional daily truck traffic is negligible over the entire area of the Air District. Finally, the number of waste disposal transport trips substantially overestimates the number of anticipated trips because owners/operators at affected facilities may use other types of add-on control equipment and most are expected to limit throughput rates or operating times which would have no impact on traffic. No increase in worker traffic is expected as the operation of air pollution control equipment of the type expected under the rule is not expected to require any additional employees. Therefore, operational traffic under the Rule 11-18 is expected to be less than significant.

Rule 12-16: The petroleum refineries affected by the rule already exist and operate within the confines of existing industrial facilities in the Bay Area. Construction activities could be required to install air pollution control equipment associated with compliance with the emissions limits contained in the rule. Any substantial construction activities associated with new refinery equipment would occur within the confines of existing refineries. Construction activities are temporary and the related construction worker traffic and delivery trucks would cease following completion of construction. No substantial increase in workers or average daily vehicle or truck trips is anticipated as a result of Rule 12-16. Therefore, the rule is not expected to result in traffic that would exceed, either individually or cumulatively, the current level of service at intersections in the vicinity of the refineries. The work force at each affected facility is not expected to substantially change as a result of the rule and any permanent increase in operation-related traffic is expected to be minimal. Thus, the traffic impacts associated with Rule 12-16 are expected to be less than significant.

XVI. c).

Rule 11-18: The rule is not expected to involve the delivery of materials via air, so no increase in air traffic is expected. The addition of new or modified air pollution control equipment is not expected to change air traffic patterns or result in a change in location that results in substantial safety risks.

Rule 12-16: Rule 12-16 would not result in a change in air traffic patterns or increase air traffic. Actions that would be taken to comply with the rule, such as installing new air pollution control equipment, would not influence or affect air traffic patterns. Further, air pollution control equipment is expected to be lower in height than other existing structures at the refinery and would not impact navigable air space. Thus, Proposed Rule 12-16 would not result in a change in air traffic patterns including an increase in traffic levels or a change in location that results in substantial safety risks.

XVI. d and e).

Rule 11-18: Rule 11-18 is not expected to increase traffic hazards or create incompatible uses. The rule does not involve construction of any roadways or other transportation design features, so no changes to current roadway designs that would increase traffic hazards are expected. Emergency access at the commercial and industrial facilities affect by the Proposed Rule 11-18 is not expected to be impacted by the rule. Each affected facility is expected to continue to maintain their existing emergency access. The rule is not expected to increase vehicle trips or to alter the existing long-term circulation patterns. The rule is not expected to require a modification to circulation, thus, no long-term impacts on the traffic circulation system are expected to occur.

Rule 12-16: Rule 12-16 would not alter traffic patterns or existing roadways, as it is not expected to generate any substantial increase in traffic. The rule would not create any traffic hazards or create incompatible uses at or adjacent to refineries. Any construction activities associated with the rule would be temporary and located within the confines of the existing refineries. The rule is not expected to require circulation modifications, thus, no long-term impacts on the traffic circulation system are expected to occur. The rule does not involve construction of any roadways, so there would be no increase in any roadway design feature that could increase traffic hazards. Emergency access at each refinery would not be impacted by implementation of Rule 12-16. Further, each affected refinery would continue to maintain their existing emergency access gates and installation of new refinery equipment is not expected to impact emergency access.

XVI. f).

Rule 11-18: The rule is not expected to affect the performance of mass transit or non-motorized travel to street, highways and freeways, pedestrian or bicycle paths. No conflicts with any congestion management programs, to include level of service and travel demand measures, or other standards established by county congestion management agencies for designated roads or highways, are expected. No changes are expected to parking capacity at or in the vicinity of affected facilities as the rule only pertains to equipment located within existing commercial and industrial facilities. Therefore, no significant adverse impacts resulting in changes to traffic patterns or levels of service at local intersections are expected.

Rule 12-16: Activities resulting from Rule 12-16 would not conflict with policies supporting alternative transportation since the rule does not involve or affect alternative transportation modes (e.g. bicycles or buses). Any construction activities associated with Proposed Rule 12-16 would be conducted at existing refineries and would be temporary so once completed, transportation, including alternative transportation modes, would not be effected.

Conclusions

Based upon the above considerations, significant adverse project-specific impacts to transportation/traffic are not expected to occur due to implementation of either Rule 11-18 or Rule 12-16 and, therefore, will not be further evaluated in the Draft EIR.

XVII. UTILITIES / SERVICE SYSTEMS.

Would the project:	Potentially Significant Impact	Less Than Significant Impact with Mitigation Incorporated	Less-than-Significant Impact	No Impact
a) Exceed wastewater treatment requirements of the applicable Regional Water Quality Control Board?				
Rule 11-18	☐	☐	☑	☐
Rule 12-16	☑	☐	☐	☐
b) Require or result in the construction of new water or wastewater treatment facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?				
Rule 11-18	☐	☐	☑	☐
Rule 12-16	☑	☐	☐	☐
c) Require or result in the construction of new storm water drainage facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?				
Rule 11-18	☐	☐	☐	☑
Rule 12-16	☐	☐	☐	☑
d) Have sufficient water supplies available to serve the project from existing entitlements and resources, or would new or expanded entitlements needed?				
Rule 11-18	☐	☐	☑	☐
Rule 12-16	☑	☐	☐	☐
e) Result in a determination by the wastewater treatment provider which serves or may serve the project that it has adequate capacity to serve the project's projected demand in addition to the provider's existing commitments?				
Rule 11-18	☐	☐	☑	☐
Rule 12-16	☑	☐	☐	☐
f) Be served by a landfill with sufficient permitted capacity to accommodate the project’s solid waste disposal needs?				
Rule 11-18	☐	☐	☑	☐
Rule 12-16	☐	☐	☑	☐
g) Comply with federal, state, and local statutes and regulations related to solid waste?				
Rule 11-18	☐	☐	☑	☐
Rule 12-16	☐	☐	☑	☐

Setting

The BAAQMD covers all of Alameda, Contra Costa, Marin, San Francisco, San Mateo, Santa Clara, and Napa Counties and portions of southwestern Solano and southern Sonoma Counties. The area of coverage is vast (about 5,600 square miles), so that land uses and the affected environment vary greatly throughout the area.

Given the large area covered by the BAAQMD, public utilities are provided by a wide variety of local agencies. The affected facilities have wastewater and storm water treatment facilities and discharge treated wastewater under the requirements of NPDES permits.

Water is supplied to affected facilities by several water purveyors in the Bay Area. Solid waste is handled through a variety of municipalities, through recycling activities, and at disposal sites.

There are no hazardous waste disposal sites within the jurisdiction of the BAAQMD. Hazardous waste generated at area facilities, which is not reused on-site or recycled off-site, is disposed of at a licensed in-state hazardous waste disposal facility. Two hazardous waste disposal facilities are located in California: (1) The Clean Harbors facility in Buttonwillow (Kern County); and (2) the Waste Management facility in Kettleman Hills. Hazardous waste also can be transported to permitted facilities outside of California. The nearest out-of-state landfills are U.S. Ecology, Inc., located in Beatty, Nevada and USPCI, Inc., in Murray, Utah.

Regulatory Background

City and/or County General Plans usually contain goals and policies to assure adequate utilities and service systems are maintained within the local jurisdiction.

Discussion of Impacts

XVII. a, b, d and e).

<u>Rule 11-18</u>: Rule 11-18 is designed to reduce health risks from stationary sources in the Bay Area. The facilities affected by the rule already exist and already use water, generate wastewater, treat wastewater, and discharges wastewater under existing wastewater discharge permits. The potential water use and wastewater impacts associated with implementation of Rule 11-18 are addressed under Hydrology and Water Quality (see Section IX a.) and have been determined to be less than significant.

<u>Rule 12-16</u>: The refineries affected by Rule 12-16 already exist and already use water, generate wastewater, treat wastewater, and discharge wastewater under existing wastewater discharge permits. The rule may potentially require additional air pollution control equipment. The potential water use and wastewater impacts associated with implementation of Rule 12-16 are addressed under Hydrology and Water Quality (see Section IX a.).

XVII. c).

Rule 11-18: Implementation of Rule 11-18 may require new or modified pollution control equipment within the confines of existing facilities. These modifications would not alter the existing drainage system or require the construction of new storm water drainage facilities. Nor would the changes required by the rule create or contribute runoff water that would exceed the capacity of existing or planned storm water drainage systems or provide substantial additional sources of polluted runoff. Therefore, no significant adverse impacts on storm drainage facilities are expected.

Rule 12-16: Rule 12-16 may result in the installation of air pollution control equipment, but would not alter the existing drainage system or require the construction of new storm water drainage facilities. Nor would the rule create or contribute runoff water that would exceed the capacity of existing or planned storm water drainage systems or provide substantial additional sources of polluted runoff. Therefore, no significant adverse impacts on storm drainage facilities are expected.

XVII. f and g).

Rule 11-18: The rule would reduce health risk posed by existing commercial or industrial facilities. The primary method for reducing these health impacts would be to reduce emissions of TACs, including the use of control technology like baghouses and catalytic oxidizers. Baghouses and catalytic oxidizers will generate solid waste, but they are not expected to require annual replacement events. The baghouses and spent catalyst are only expected to generate a few tons of waste per change out. It is assumed that any hazardous material will be taken to the U.S. Ecology Beatty Nevada hazardous waste facility for treatment and disposal. U.S. Ecology, Inc. is currently receiving waste, and is in the process of extending the operational capacity for an additional 35 years (U.S. Ecology, 2015). Clean Harbors in Grassy Mountain, Utah is also available to receive hazardous waste and is expected to continue to receive waste for an additional 70 years (Clean Harbors, 2015). Therefore, the rule impacts on hazardous waste landfills are less than significant.

The rule is not expected to generate any significant increase in solid waste. Therefore, no significant adverse impacts are expected to solid waste as a result of the rule.

Rule 12-16: No significant impacts on waste generation are expected from the implementation of Proposed Rule 12-16 because the rule would potentially result in the installation of additional air pollution control equipment which is not expected to create substantial quantities of solid or hazardous waste. Waste streams from refineries would be processed similarly as current methods, so no significant impact to land disposal facilities would be expected. Therefore, no significant impacts to hazardous waste disposal facilities are expected due to the rule. Facilities are expected to continue to comply with all applicable federal, state, and local statutes and regulations related to solid and hazardous wastes.

Conclusions

Rule 11-18: Based upon these considerations, no significant adverse impacts to utilities/service systems are expected from the adoption of the rule.

Rule 12-16: The potential water and wastewater impacts associated with implementation of Rule 12-16 are addressed under Hydrology and Water Quality (see Section IX above). Based upon the above considerations, no additional significant adverse impacts are expected to storm water drainage, solid waste disposal or landfills due to implementation of Rule 12-16. Therefore, the impacts on utilities will not be further evaluated in the Draft EIR (except for the water and wastewater impacts that will be addressed under Hydrology and Water Quality).

XVIII. MANDATORY FINDINGS OF SIGNIFICANCE.

Would the project:	Potentially Significant Impact	Less Than Significant Impact with Mitigation Incorporated	Less-than-Significant Impact	No Impact
a) Does the project have the potential to degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, reduce the number or restrict the range of a rare or endangered plant or animal, or eliminate important examples of the major periods of California history or prehistory?				
Rule 11-18	☐	☐	☐	☑
Rule 12-16	☐	☐	☐	☑
b) Does the project have impacts that are individually limited, but cumulatively considerable? ("Cumulatively considerable" means that the incremental effects of a project are considerable when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects)?				
Rule 11-18	☑	☐	☐	☐
Rule 12-16	☑	☐	☐	☐
c) Does the project have environmental effects that will cause substantial adverse effects on human beings, either directly or indirectly?				
Rule 11-18	☐	☐	☑	☐
Rule 12-16	☐	☐	☑	☐

Discussion of Impacts

XVIII. a).

Rule 11-18: Rule 11-18 does not have the potential to degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, reduce the number or restrict the range of a rare or endangered plant or animal, or eliminate important examples of the major periods of California history or prehistory, as discussed in the previous sections of the CEQA checklist. The rule is designed to reduce health risks from commercial or industrial facilities in the Bay Area, thus providing a beneficial air quality impact and improvement in air quality. As discussed in Section IV, Biological Resources and Section V, Cultural Resources, no significant adverse impacts are expected to biological or cultural resources.

Rule 12-16: Rule 12-16 does not have the potential to degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, reduce the number or restrict the range of a rare or endangered plant or animal, or eliminate important examples of the major periods of California history or prehistory, as discussed in the previous sections of the CEQA checklist. Rule 12-16 may require the installation of emission control equipment. As discussed in Section IV, Biological Resources and Section V, Cultural Resources, no significant adverse impacts are expected to biological or cultural resources, as any construction activities are expected to remain within the confines of existing refineries which have already been graded and developed.

XVIII. b and c).

Rule 11-18: The rule is designed to reduce health risks from commercial, industrial and institutional facilities in the Bay Area, thus providing a beneficial air quality impact and improvement in air quality. However, construction and operation of air pollution control equipment has the potential to increase emissions of other emissions, including GHGs and criteria pollutants. The potential secondary adverse air quality impacts associated with implementing Rule 11-18, including any cumulative air quality impacts will be evaluated in the EIR. The rule is expected to reduce TAC emissions, thus reducing the potential health impacts.

Rule 12-16: Rule 12-16 may require the installation of emission control equipment, if the emissions limits are exceeded. The rule could require construction and installation of new air pollution control equipment which could result in secondary air emissions as well as additional GHG emissions. Therefore, the air quality and cumulative impacts associated with implementation of Rule 12-16 will be evaluated in the Draft EIR.

Chapter 3

References

Association of Bay Area Governments, 2006. Projections 2007, December 2006.

BAAQMD, 2010. Bay Area 2010 Clean Air Action Plan, September 15, 2010.

Metropolitan Transportation Commission (MTC), 2013. Environmental Impact Report Plan Bay Area Draft. Metropolitan Transportation Commission and Bay Area Association of Governments. April, 2013.

APPENDIX A

BAAQMD REGULATION 11, RULE 18: REDUCTION OF RISK FROM AIR TOXIC EMISSIONS
&
BAAQMD REGULATION 12, RULE 16: PETROLEUM REFINING FACILITY-WIDE EMISSIONS LIMITS

COMMENT LETTERS RECEIVED ON THE NOP/IS

COMMENTS:

The following comments were received on the NOP/IS for the BAAQMD Regulation 11, Rule 18: Reduction of Risk from Air Toxic Emissions and BAAQMD Regulation 12, Rule 16: Petroleum Refining Facility-Wide Emissions Limits Project. The names of the commenters are provided in Table A-1.

TABLE A-1

List of Commenters

CASA	Greg Kester, California Association of Sanitation Agencies
CAP	Cathy Helgerson, Citizens Against Pollution
CBE et al.	Devorah Ancel, Sierra Club; Kevin Bundy, Center for Biological Diversity; Laurence G. Chaset, Sustainable Energy Futures for 350 Bay Area; Roger Lin, Communities for a Better Environment; David Pettit, Natural Resource Defense Council
CCEEB	Bill Quinn, California Council for Environmental and Economic Balance
Phillips 66	Don Bristol, Phillips 66
WSPA	Catherine Reheis-Boyd, Western States Petroleum Association

CALIFORNIA ASSOCIATION of SANITATION AGENCIES

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December 2, 2016

SUBMITTAL VIA EMAIL TO: vdouglas@baaqmd.gov

Mr. Victor Douglas
Principal Air Quality Specialist
Technical Services
Bay Area Air Quality Management District
375 Beale Street, Suite 600
San Francisco, CA 94105

SUBJECT: COMMENT LETTER ON PROPOSED BAAQMD REGULATION 11, RULE 18: REDUCTION OF RISK FROM AIR TOXIC EMISSIONS AT EXISTING FACILITIES

Dear Mr. Douglas:

The California Association of Sanitation Agencies (CASA) appreciates the opportunity to comment on the Bay Area Air Quality Management District's (BAAQMD) proposed Regulation 11, Rule 18 (Rule 11-18). CASA is an association of local agencies, engaged in advancing the recycling of wastewater into usable water, generation of renewable energy, biosolids and other valuable resources. Through these efforts we help create a clean and sustainable environment for millions of Californians.

It appears that the proposed Rule 11-18 has been developed in reaction to community concern about only a few existing facilities, and the BAAQMD's proposed regulatory response impacts more agencies than necessary to reach its air quality goals. BAAQMD staff estimate that hundreds of facilities could be affected by this rule (Notice of Preparation/Initial Study; Regulation 11, Rule 18 and Regulation 12, Rule 16; Page 1-9 October 2016). While CASA appreciates the outreach that BAAQMD staff has done, there are dozens of POTWs that have not been engaged on this issue, and have only very recently become somewhat aware of this significant regulatory initiative. Based on this sector, it seems likely that there are far more, perhaps hundreds, of potentially impacted facilities who are not aware nor have considered the impact and cost of this Regulation, and have thus not had the opportunity to provide meaningful comments for your consideration. Therefore, we ask that the BAAQMD consider a more robust effort to meet in workshop formats with all affected facilities to review the basis for the Regulation, describe the proposed compliance routes, and collectively understand its potential impacts. CASA has further concerns that the action taken by the BAAQMD may be mimicked in other Air Districts and thus believes it is critical that any action be fully vetted and supported by science.

CASA's specific comments on the proposed Rule 11-18 are as follows:

1) <u>**Public notification by BAAQMD for Rule 11-18 should clarify that emissions have not increased**</u>

Despite there being no change in a POTW's emissions levels, incorporating the updated California Air Pollution Control Officers Association (CAPCOA) risk factors and guidelines may result in the first notification the public receives about an existing facility within its vicinity. This notification could result in greater public anxiety about health risks from existing stationary sources. Providing a clear explanation that the changes in facility risk estimates are due exclusively to changes in risk assessment methodology, not actual increases in emissions (and health risk), should be incorporated in the public notification. CASA, along with many other public and private entities raised this issue in a letter to CAPCOA on October 27, 2016. Please let me know if you would like a copy of that letter.

CASA recommends the public notification of risk include language providing context to the risk values to improve public understanding and reduce potential anxiety.

2) <u>**Proposed rule should not inadvertently discourage renewable energy production**</u>

While the purpose of the proposed Rule 11-18 is to reduce toxic air contaminants and protect public health, it may discourage the production and beneficial use of biogas for the generation of renewable energy or fuel, resulting in a wasted (flared) resource. Most CASA members already beneficially use biogas generated from anaerobic digestion of sewage sludge to generate renewable electricity. Not only does this practice offset the treatment plant's dependence on fossil fuel based energy, it reduces the resulting anthropogenic greenhouse gas emissions.

The production of biogas, production of renewable energy, and the reduction of greenhouse gas emissions support statewide greenhouse gas reduction goals set under Assembly Bill 32 and Senate Bill 32. Furthermore, the State Air Resources Board would like to see POTWs accept additional organic waste streams (specifically, diverted food waste and fats, oils, and grease from landfills) for co-digestion with sewage sludge to increase generation of biogas, in turn increasing renewable energy/fuel production in support newly adopted mandates under Senate Bill 1383 (reducing methane emissions across the state). However, the proposed Rule 11-18 may restrict use of biogas since its combustion may contribute to a slight increase in some toxic air contaminants, potentially forcing POTWs to purchase fossil fuel based electricity or natural gas. This would result in an increasing in fossil fuel based greenhouse gas emissions statewide and is in direct contradiction with the Governor's goals for 2020, 2030, and beyond. The practice of diverting this organic waste from landfills for co-digestion at wastewater treatment plants is increasing across the state making Rule 11-18 a significant factor in achieving these goals moving forward.

CASA recommends BAAQMD consider providing exceptions in Rule 11-18 for projects that contribute toward achieving state goals for

reductions in greenhouse gas emissions through the diversion of organic waste from landfills, and increased production of biogas for the generation of renewable energy or fuel.

3) <u>BAAQMD should consider cross-media environmental impacts</u>

POTWs are regulated by a number of different governmental agencies whose goals can result in contradictory impacts to the municipal wastewater treatment sector. While regulatory actions may be seen as effective when each media (air, water, land) is addressed separately, the deficiencies become evident when the regulations are viewed holistically for protecting the overall environment and public health. CASA hosted a cross-media roundtable with state regulatory agencies including the Air Resources Board in 2008 highlighting these issues. A regulatory checklist was developed as an outcome of that meeting which was intended to highlight cross-media issues during regulatory development. CASA would be pleased to provide a copy of the checklist to the BAAQMD. There are increasing concerns about cross-media impacts and the potential operational and financial effects they will have on POTWs that are trying to provide an essential public service while maintaining compliance with regulations supporting contradictory goals.

CASA recommends a holistic approach and asks BAAQMD to address the cross-media environmental impacts of the proposed Rule 11-18 and in future proposed regulations.

Thank you for the opportunity to comment on the draft Rule 11-18. CASA supports BAAQMD's intent to protect the Bay Area's air quality, but asks BAAQMD to carefully address our concerns. CASA also strongly supports the comments provided to you by the Bay Area Clean Water Agencies (BACWA). Please feel free to contact me with any questions at gkester@casaweb.org or at 916-844-5262.

Sincerely,

Greg Kester

Greg Kester
Director of Renewable Resource Programs

cc: Roberta Larson, Executive Director, California Association of Sanitation Agencies
Dave Williams, Executive Director, Bay Area Clean Water Agencies
Debbie Webster, Executive Officer, Central Valley Clean Water Association
Steve Jepsen, Executive Director, Southern California Alliance of POTWs

To: Bay Area Air Quality Management District – Victor Douglas

From: Cathy Helgerson – CAP – Citizens Against Pollution

Regarding Draft Comments – Regulation 12, Rule 16 Petroleum Refining Facility – Wide Emissions Limits and Regulation 11 Rule 18

Project Description

1.0 Project Description – 1.1 Introduction Paragraph 1 – States that Petroleum refineries are significant sources of harmful pollutants. Comment: This is very true and people are getting sick and dying.

Paragraph 3 - Mentions Communities for a Better Environment (CBE) and several associated operations have recommended that the Air District adapt new Regulation 12, Rule 16: Petroleum Refining Facility Wide Emissions Limits (Rule 12-16 or "Refining Caps Rule") This rule would set numeric limits on specific refinery emissions, Rule 12-16 would apply only to the Bay Area five petroleum refineries and three facilities associated with the refineries.

Paragraph 4 - Air District Recommends Regulation 11 Rule 18 would apply to all facilities whose emissions of Toxic Air Contaminants (TAC) may result in a significant risk to nearby residents and workers- this would include petroleum refineries. It goes on to state – The purpose of 1118 is to set Toxic Air Contaminant Caps for those facilities causing the highest health impacts across the bay area and to require these facilities to reduce that health risk.

Paragraph 5 – EIR – Environmental Impact Report it is said will cover both Rules. The Board of Directors could adopt either rule, both rules, or neither rule it would be up to them.

1.1.1 Draft Rule 12-16 – Reflects a policy recommendation from CBE and their associated organizations. The rule as proposed by CBE, would limit the emissions of climate pollutants and three criteria pollutants greenhouse gases (GHG's) particulate matter (PM), oxides of nitrogen (NOX), and sulfur dioxide (SO2) from petroleum refineries and three associate facilities. The Draft Rule would establish facility – wide emissions limits for the covered pollutants at each of the affected to ensure that each facility does not increase emissions due to changes in operation, crude or product slates, or increases in product production. Each facility emission limit would be set at maximum – annual emissions reported for that facility in the period from 2011 through 2015 with an additional allowance or "threshold factor" of seven percent over the maximum annual emission rate for each pollutant.

Comment; It mentions that each facility emissions limit would be set at the maximum – annual emissions reported for that facility in the period from 2011-2015 with an additional allowance or "threshold factor" of seven percent over the maximum annual emission rate for each pollutant. The facilities do their own reporting and submit reports how can we be sure that their reports are honest and accurate? The TAC – Toxic Air Contaminants Reporting Systems is not an enforcement agency it just states what the pollution levels of each pollutant that is not enough. The EPA TRI System if reporting is also a reporting system nothing else we need an enforcement agency system. If the EPA does not investigate the facility and its records to make sure the facility has sent in their reports the matter goes unnoticed. This happened to Lehigh Southwest Cement and Quarry they failed to report the emissions with the TRI System requirements and they were fined. The EPA Region 9 just happened to see if Lehigh had reported to the TRI Department their emissions levels and they had not. I asked the EPA if they were going to check each year to see if Lehigh sent in their reports and I was told that they could not. I believe because I was asking about Lehigh that the EPA decided to check into this and I am glad they did.

The emissions ae high overall and then to add an additional allowance or “threshold Factor” of seven percent over the maximum annual emissions rate for each pollutant is very wrong.

Question: How do these Regulations and Rules effect the Lehigh Southwest Cement and Quarry operation?

1.1.2 Draft Rule 11-18, as proposed by the Air District staff, would ensure that emissions of Toxic Air Contaminates (TACs) from existing facilities do not pose an unacceptable health risk to people living and working nearby. It states that the rule would require facilities with a cancer risk in excess of 25 in a million (25/M) to reduce that risk below (10/M). It mentions further reductions.

Comment: It states if the facility could not devise a means to reduce the risk below 10/M, the facility would be required to install best available retrofit control technology for toxic pollutants (TBARCT) on every significant source of TAC’s at the facility. Who can determine the cancer risks? There is no mention of any cumulative effects from all the pollutants this seems to be continually overlooked. The Best Available Technology determination on equipment is left up to the facility to explore. I would like to know can the Air District actually determine that Lehigh for instance has found the Best Available Technology. Lehigh Southwest Cement and Quarry is also operating under a grandfathered protection rule and the plant is old and has not been retrofitted and upgraded as it should be so the public suffers continually. They are also using Petroleum Coke to fire up and operate the kiln this product Petroleum Coke is a waste material of Petroleum and is also radioactive. I have been told that it is worse than coal there needs to be a better way. The public is suffering cancer it is at epidemic stages everyone is getting it and other health problems. The public must be protected from this ongoing pollution. There needs to be a 24/7 surveillance cameras set up at each facility to make sure that the polluters are not out of serious compliance. The film and reports off of the surveillance cameras and monitor reports should be relayed to the Air District and the EPA immediately. Lehigh Southwest Cement is spewing pollution they must be sited and or closed down by the inspector.

1.2 Agency Authority – California Environmental Quality Act (CEQA) mentioned. The Air District is the lead agency they will prepare a Draft Notice of Preparation (NOP), and Environmental Impact Report (EIR) and Initial Study (NOP/IS) to address the potential environmental impacts associated with the draft rules. Comment: It seems that a great deal of information has been left out of this draft. The problem of enforcement from the agencies is evident stronger rules must be administered along with real enforcement and that is just not happening.

1.3 Project Location – Santa Clara County is included so we must of course look at all for toxic pollutants (TBARCT) on every significant source of TAC’s at the facility.

Comment: Question – Who can determines the cancer risks and how is it really accurate? There is no mention of any cumulative effect from all the pollutants this seems to be always overlooked. The Best Available Technologies available seem to be not enough people are still sick and dying.

Lehigh Southwest Cement and Quarry is also operating under a grandfathered protection rule and the plant is old and has not been retrofitted and upgraded so that it can be considered under the New Plant Rules and Regulations. There needs to be methods to require a facility that is outdated with its facility to be required to upgrade otherwise the public is continually subjected to a lower standard which is dangerous. They are also using Petroleum Coke to heat the kiln which is a waste material of Petroleum and is also radioactive and a serious pollutant. The Question is how will this be monitored no mention of the serious effects of this waste material and the emissions coming from the kiln that is causing serious health problems. I have even heard that this Pet Coke is worse than coal someone needs to look into this matter.

The pollution from these polluters is creating serious climate change issues and things are getting worse and worse we the public must demand action from the agencies this matter cannot wait.

I live in Cupertino near the Lehigh Southwest Cement and Quarry, and the Stevens Creek Quarry both of these companies with their pollution is destroying the Silicon Valley, the SF Bay Area and my home. There is dust and pollution in the Air, Water and on and in the Soil causing horrible health problems and even death this must stop. This pollution cumulates in our bodies and is the cause of so many health issues and problems. Human life, aquatic life, animal life and even plant life are threatened by this pollution we must all take responsibility in this matter, and ask the agencies to enforce stronger restrictions on these polluters. The paying of fines due to their pollution is not enough closing down the facilities and putting the polluters in jail seems to be necessary in order to really protect the public. The companies write off the fines they pay as a way of doing business this is just outrageous and cannot continue.

This pollution in California and the world is causing the great drought we are experiencing and even thou we are having some rain it will not be enough. I also suspect the US Government and the State of California is seeding the clouds and I have viewed jet stream myself to that effect. The chemicals that the jets are emitting to the clouds to make rain are just that chemicals and they are harming the public with these chemicals this should not continue.

The Air District needs to look at what the dust and water pollution is doing to the Stevens Creek Reservoir, creeks and the aquifer below our valley and homes. This pollution has polluted our groundwater and the wells that bring our water to our homes.

The Air District should not just consider the air pollution issues going out into the air, but they must consider pollution in water and soil that is coming from the air. They must also work together with the other agencies to make sure that this pollution does not continue to destroy communities and our world.

1.4 Back Round – Draft Rule 12-16 would affect the five petroleum refineries.

Comment: First I would like to say that I feel so sorry for the poor people that are living right next door to these polluters it is just horrible. I do not know how they can breath and how they have survived. There needs to be a compensation made for their loss maybe paying for their hospital bills but of course once the agencies make them provide compensation then they would also be in line of large law suites.

There is proof out there that pollution causes cancer and other health problems and even death but it seems no one wants to explicitly attach that proof or information to the polluters. They are allowed to keep polluting because as in Lehigh Southwest Cement and Quarry we need cement and so it seems that cement production is more important than people's lives. I would also suppose that we need Petroleum Refineries for oil so again we are faced with a very difficult situation how do we mine for resources without polluting the public?

There needs to be new technologies provided out there and these new technologies must be implemented immediately in order to save lives. These Petroleum and Cement companies are very wealthy and rich and could pay for the Best Available Technology but how can we leave the decision up to them? They may not be willing to retrofit a plant as is the case with the Lehigh Southwest Cement and Quarry instead they do the least amount of changes hoping that no one will tell them they have to retrofit completely or build a new plant. They do not want to be under the Rules pertaining to new plants because with their old equipment they cannot meet the new standards.

I believe that a special Division or Department with the agencies should look at and really find out what is the very best equipment and technology available. The facilities must upgrade their facilities accordingly and if they cannot they must close their doors. If we can send a man to the moon then we should be able to stop pollution and climate change.

I was reading the letter from Don Bristol with the Phillips 66 Company commenting on the Regulations and Rules he mentioned that Refinery owners and operators including Phillips 66 have vested rights in currently held enforceable permit limits. The vested rights issues are killing us there needs to be a change in Government with the Rules and Regulations, so as to protect the public from this dangerous pollution. There must be stop to contamination of our Cities from the heartless polluters who care only about the profits and revenue gained by the production of their products.

Draft Rule 11-18 would affect up to 1,000 facilities that emit TAC's. The Draft States that the Air District has determined that these emissions need to be reduced in order to be more protective of public health. These facilities include data centers, petroleum refineries, a cement kiln, gasoline dispensing facilities act. These facilities emit a variety of TAC's that can adversely impact public health. TAC's include compounds such as diesel particulate matter (DPM), benzene, polycyclic aromatic hydrocarbons (PAH's) and, 1.3-butadiene.

Comment: The Drafted Rule 12-16 and 11-18 cover many dangerous pollutants but there is nothing in the Draft that mentions how the Air District will specifically implement these new Rules and Regulations. I would like to see a more involved description of the overall implementation strategy. Putting generalizations on paper is not enough I want expressive details. The TAC's list has been around for a long time and the pollutants and the levels of pollution has not been addressed the way it should be.

The people are sick and dying a great more needs to be done if humanity is to survive we need strong enforcement tactics and technology needs to catch up in order to protect the public. There is no real enforcement if polluters do nothing but pay a fine. The Government makes out financially from these fines, but pays later for the hospitalization of persons who are left to suffer from this pollution.

Trying to set caps on these polluters is not enough because it leaves out the cumulative effect. How do we know that these caps actually are set honestly? People are sick and dying things are getting worse and worse climate change is real what are we to do?

Page 6 States the regulatory approach for Draft Rule 12-16 and 11-18 are summarized below and include the following basic elements.

Regulation 12, Rule 16 part of the basic element states that each facility emissions limit would be set at the maximum-annual emissions reported for that facility in the period from 2011 through 2015, and include an additional allowance or “threshold factor” that would equal seven percent over the maximum for GHGS, PM2, PM10, NOx, and SO2.

Comment: The Annual Emissions Inventory with the facility-wide emissions limits for each covered pollutant are set at what they are why would we want to start there? The facilities report their own emission levels like the fox watching he chickens how do we know what they are reporting is honest? There needs to be standards that actually stop the pollution and these standards actually protect the public. It seems that the maximum-annual emissions are set to allow the facilities to continue to produce their products because if the levels were lower the facility may not be able to operate. The real goal is to develop technology that will eliminate pollution overall with zero emissions wishful thinking yes but necessary. It seems the Regulations and Rules sure look good on paper can are they do the job.

1.5 Proposed Project Description – the description of Draft Regulation 11, Rule 18 and regulation 12, Rule 16 are provided below.

1.51 Regulations 12 rule 16

1.5.1.1 Pollution Coverage – The Draft Refining Cap Rule would limit the emissions of climate pollutants (GHG’s) and three criteria pollutants (PM-both PM10 and PM2.5, NOx, and SO2) from refineries and other refining related facilities to a specific baseline plus and allowance; there by establishing a “CAP” for each of these emissions facility could not exceed.

Comment: Greenhouse Gases (GHGs) is real Lehigh Southwest Cement and Quarry contributes to this problem especially with the burning of Petroleum Coke how will this problem be solved? It would take the development of new technology and new thinking coming into place.

The agencies are not working together to stop this ongoing pollution and they seem to think that just lowering the pollution levels in their eyes is enough how can that be when so many people are sick. I will continue to mention the cumulative effect and how this plays into the serious health issues. There is also the Chemical Cocktail mixing of pollutants combining these pollutants makes them even more hazardous and dangerous.

Particulate Matter PM is also a complex issue there is an assortment of Tiny Airborne Particles that vary in size and mass (ultrafine, fine and course, physical state (solid or liquid), chemical compositions, toxicity, and how they behave in the atmosphere.

Comment: These Airborne Particles are destroying our lungs, bloodstream, brain and other vital organs, and individual cells. They trigger asthma attacks, chronic bronchitis, impaired lung development in children and adults, heart attack, stroke, and premature death. If the agencies know all this than why is it that the pollution still is allowed to flow into our cities and homes.

Nitrogen Oxides (NOx) – States these contaminants can damage vegetation and negatively impact the health of humans and animals.

Comment: Cancer in humans and animals is on the rise it is at epidemic stages, two out of three people are getting cancer. We must stop this pollution, or all of us will have health problems and will die as a result of this pollution. It mentions how this pollution can harm vegetation trees that are so valuable to our existence and our vegetable gardens what we eat is also becoming contaminated.

The dust from Lehigh Southwest Cement and Quarry and the Steven Creek Quarry is every place contaminating the Air, Water and Soil where we live. The dust is even eating the paint off of my car can you imagine what it is doing to our bodies.

Sulfur Oxides (SOx) – Heating and burning fossil fuels (such as coal and oil) release the sulfur present in these materials causing major air pollution problems the most common sulfur oxide is SO2.

Comment: This heating and burning of fossil fuels which can form Sulfur Oxide and in turn cause sulfuric acid in the presents of moisture. This process causes acid rain which causes all kinds of problems to our environment and to human existence.

1.5.1.2 Affected Facilities – Lets no limit it to just those.

1.5.1.3 The Emissions Units – Comments: Do not use old data maximus – year actual emissions reported in 2011-2015 plus additional allowances or threshold factor, of seven percent that is intended to account for normal year – to – year variations in emissions. There needs to be real life saving levels taken from monitors used for this purpose to record actuals to date emissions levels. The facilities report the levels themselves and submit them to the Air District so how can we be sure that the levels they report are accurate or honest? The problem with the Air District is they have to lower emissions to the point of allowing Lehigh and other polluters to continue to operate, so if the levels are to low and they cannot operate the Air District must allow higher levels of pollution to be emitted. I am sorry but my solution to the problem is to close down the Lehigh Cement and Quarry and the Steven Creek Quarry and clean up with a Super Fund Site once cleaned turning the properties into State and or Federal Parks.

Table 1 – The Enforceable Emission Limits on Refinery – Wide Emissions – Comments: This table reflects the information tables sent to the Air District by the Facilities themselves. Regulation 11, Rule 18 States that the Air District would screen all facilities that report toxic emissions and conduct health risk assessments (HRA) for facilities with a cancer risk prioritization score of 10 or greater or a non cancer

prioritization score of 1.0 or greater. The HRA's would incorporate the New Office of Environmental Health Hazard Assessment (OEHHA) protocol and health risk value adopted in March 2015, the Risk Management Guidelines adapted in July 2015 by the California Air Resource Board (ARB) and the California Air Pollution Control Officers Association CAPCOA) and the revised Air District HRA guidelines. It talks about the first phase of the rule, facilities that pose a cancer risk in excess of 25/M or a chronic or acute hazard index in excess of 2.5 must either reduce the facility cancer risk below 10/M and reduce the chronic and acute hazard below 1.0; or install TBARCT on all significant sources of toxic emissions. In the second phase, facilities not already addressed in the first phase that pose a health risk in excess of 10/M or a chronic or acute hazard index in excess of 1.0 must either except GHGs, which are based on 2011 through 2014 emissions due to the current unavailability of 2015 data reduce the facility cancer health risk below 10/M and reduce the chronic and acute hazard indexes below 1.0; Install TBARCT on all significant sources of toxic emissions.

Comment: The Air District is not clear on a TBARCT Installation this should be explained in the draft clearly. The question is with regards to enforcement how will all of this be enforced this definitely needs to be spelled out in order to make sure that the public is truly protected. It seems to be extremely evident that no one really knows if this will really work or not and seems to be impossible. If this was ever possible why had the agencies not implemented it before? I believe with the present technologies that there is no way a polluter like Lehigh can reduce emissions to accommodate these rules. The public is also asked to wait till 2020, 2030 or even longer to finally complete the requirements. The public's health is in grave danger and we keep pushing the years further out till a person really wonders if it will ever really happen. How can we also think that the information compiled from the facilities and the Air District is honest and correct? The facilities may lie about the emission reports they turn in in order to save themselves. We cannot use these levels to determine CAPS there needs to be a health and safety real limits set. I think that until we can stop or control the emissions completely that the public will always be at risk of serious health issues and even to the point of death.

1.5.14 – Changes in Monitoring Methods – The proposed rule would incorporate a means to address potential changes in the quantities of emissions reported due solely to changes in monitoring methodologies to ensure constant compliance with the emissions limits.

Comment: The changes in the monitoring Methods should be again spelled out in the report and they are not my question is why not? There would need to be new and advanced technologies implemented because what is in place is not working. The TRI reporting system is flawed and really without merit. It is susceptible to very incorrect information submitted by Lehigh and other polluters. I was informed by the Air District that the facilities even add to the pollution levels they say they are emitting so as not to be called by the EPA. I find this hard to believe, but who knows what is really taking place if Lehigh and other polluters are sending in their own information and the EPA is taking this information and putting it in the TRI System. Note: The TRI System is hard to access and very difficult to read this needs to change.

The public needs to see that the information coming from the facilities is real. The monitors put in place at the facilities need to report directly to the Air District and the EPA. The information must be reported truly and honestly and there should be no way that the facilities can lie about their pollution. Once this information is registered off of the monitors at the facilities and there is a violation the Air District inspectors need to go out and write up the polluters right away. There should be fines imposed and also a possibility that the facility can be shut down until they are in compliance. If the facility cannot control their emissions and they are always out of compliance then they should be shut down.

1.5.2 Regulation 11, Rule 18

1.5.21 Administrative Procedures – It states that the Draft Toxic Risk Reduction Rule would utilize the annual toxic emissions inventories reported to the Air District by sources that emit toxic compounds. From the Toxic Emissions Inventory date, Air District would conduct a site-specific Health Risk Screening Analysis (HRSA) in order to assess the potential for adverse health effects. From these HRSA; the Air District would categorize each facility to determine cancer risks

Comment: There seems to be again no mention of the cumulative effect levels that should determine the cancer risk from ongoing pollution exposures. Number scores do not reflect the real danger.

1) Basing the amount of toxic pollution emitted from based on reports submitted by the facility is endangering the public. How do we know based on the TAC and TRI reports if in fact they are reporting honestly? The need for installing surveillance equipment is evident and should be put on each facility's recording equipment. The emissions information should be relayed from each monitor to the Air District and the EPA directly without delay. The inspector is available 24/7 and is able to go right away to stop the emissions that are causing the violation. The inspectors are not available after 5:00 PM Monday through Friday and also not available Saturday and Sunday this is leaving the public subjected to dangerous pollution. The inspector may have to shut down the facility completely until the violation can be corrected and if it cannot the facility should be closed for good.

2) There is another serious matter that needs to be taken into consideration and that is the cocktail effect mixing all these pollutants together is forming an even further danger to the public and it must stop. There needs to be more research done on this effects and it needs to take place soon, again to protect the public who are not aware of the dangers and leave their lives in the hands of the agencies.

3) Proximity of the facility the Lehigh Southwest Cement and Quarry and the Steven Creek Quarry are very near a large populous The City of Cupertino especially is subject to thousands and thousands of pounds of pollution coming from the Lehigh Southwest Cement and Quarry and the Steven Creek Quarry. The Air, Water and Soil is completely contaminated with this pollution and it is a grave danger to the public, this matter goes completely unnoticed by the Agencies, Cities, County and the General Public. I attended a meeting in Cupertino at the Cupertino City Hall sponsored by Santa Clara County. Joe Simitian a Board member was hosting this meeting. This meeting was only a tip of the iceberg a great deal of information was never brought up and discussed. The meeting is not an open forum and the public pretty much has a gag order not to speak at the meeting. The public is allowed to submit cards and then the SCC Staff and Joe Simitian decide what cards are to be considered for discussion and how. This in my opinion this is not what our Democracy was based on and I am appalled, dismayed, disheartened and disappointed with all the agencies that will not stop the pollution and continue to let the polluters go on polluting our cities. The playing down by the agencies of the seriousness of this

pollution is more than a person or persons can take and it needs to stop. The hiring of police and strong arm men to guard the agencies personnel and Santa Clara County representatives from anyone who would speak up and tell the truth at meetings is a disgrace. I must say that something needs to be done about the lingering complacency that the agencies keep presenting to the public Lehigh Southwest Cement and Quarry and the Steven Creek Quarry are not in compliance.

The analysis it is stated in order to complete the work in a timely manner that an independent contractor must be hired. I am concerned how do we know the work will be conducted accurately and honestly?

4) It states that any other factors that the Air District deems to be important.

Comment: Well than I would like to include the Ammonia emissions coming from the Lehigh Southwest Cement and Quarry which should be considered a serious pollutant and the Air District seems to think it is not. The Ammonia is added to control the NOX this is a danger to the public and it is not properly regulated. The TAC listing of pollutants and their acceptable levels does not really reflect the serious damaging pollution that is going out into the public again taking into cumulative effect is left out and the public suffers.

It states the Air District would compile two lists of facilities and determine the cancer risks to children and infants,

Comment: It does not mention and what is seriously left out is the damage these pollutants cause to the fetus. The pollution causes many birth defects and even death to the fetus and young children. I know the damage done to my unborn fetus first hand my daughter was born with brain damage and only had brain stem functioning, she suffered greatly, was hospitalized 28 times, for weeks at a time and finally died at 3-1/2 years old. They said she died from toxic shock syndrome and I believe that the pollution coming from Lehigh Southwest Cement caused this problem. There is gray dust all over my home and property, and I am subjected to breathing it into my lungs and eating this dust. This dust is also taking the paint off of my car which acts like sand paper. The pollution is affecting the Air, Water and Soil and the Air District can no longer play down the terrible health issues that this pollution is causing the public. When my daughter was born they had to perform an emergency C-section on me and I could have also died and I have the scar to remind me of this time. I have had cancer twice and have lost both breasts after three surgeries. I have asthma, diabetes, planters' foot and must also take a pill that kills the estrogen in my body to keep the cancer from coming back.

My husband had cancer and suffered from serious depression he died 3 years ago from Coronary Arrest, Liver Disease, and Alcohol abuse. My dog also died of cancer to the liver years ago and I believe that this was also caused by the Lehigh Southwest Cement and the Stevens Creek Quarry that are polluting the Air, Water and Soil in the Silicon Valley and the SF Bay Area. My son was diagnosed with Dyslexia and Add I call him my miracle son because I had infertility problems and suffered two miscarriages all of this I attribute to the pollution with the above polluters.

1.5.222 Health Risk Assessments – It states that a HRA (Health Risk Assessment consists of four basic steps: 1) Hazard identification; 2) Exposure Assessment, 3) Dose Response Assessment; and 4) Risk Characterization. The Air District conducts HRAs using standardized mythologies for each of these steps.

Comment: The question is how can these four basic steps be determined if the polluters monitor themselves? The polluters turn in their own reports and also calibrate their own machines and monitors so how can we be sure they are telling anyone the truth? The determination of all four basic steps that would consist of a Health Risk Assessment would have to include doctors and scientists that would be able to add their statistics. There would need to be an intense honest investigation that would show all functions of testing that would include the cumulative effect in order to keep the public from harm. There are many things left out of the investigation processes and it is very important that the public is informed of the true levels of pollution that is seriously affecting them.

1.5.2.3 Pollutant Coverage – The Toxic Risk Reduction rule would address TAC emissions from existing stationary sources.

Comment: I believe until the Air District and the other agencies really do their own testing with their own monitors that cannot be tampered with that it is impossible to really know what is really being emitted from the polluter facilities. The pollutants mentioned are very carcinogenic – Benzene, 1,3-Butadiene, Polycyclic Aromatic Hydrocarbons (PAHs) and Diesel Particulate Matter (DPM) but there are many more. The cocktail and the cumulative effect is a serious matter and again nothing is mentioned in the Draft this should not be overlooked.

1.5.2.4 Source Coverage

Comment: Let us not forget the Lehigh Southwest Cement and Quarry in Cupertino that is polluting the Silicon Valley and the SF Bay area. The Toxic Health Reduction Rule will need to be fine- tuned and specializing in the elimination of the pollution as a whole. Reducing emissions in anyway will not solve the serious problem of the cumulative effect. The pollution is harming humans, animals and aquatic life we the people need to request that our Government invest in new technologies that will eliminate pollution completely. Is this wishful thinking I suppose so but after all we sent a man to the moon we should be able to resolve this problem. The economic issues should not be holding back the saving of people's lives and the planet from pollution, climate change and the drought here in California.

The 6,000 facilities out there should all be considered for regulating but the Air District as only mentioned 1,000 facilities. The Rule and Regulation looks good on paper but what will it really mean to the public especially if it is many years down the line. The public suffers health issues while the Air District try to figure out what to do and how to do it this should be the highest priority and it is not. The reason given is due to the lack of funding and manpower we just can't do the job faster. What is wrong with our Government why are not seeing that everyone is getting cancer other health issues and even death?

The problem has been that there really is no real enforcement the facility in violation just pays a fine and then go right back to polluting again writing off the fine as a cost of doing business. It seems no one will stop the crimes that are being committed against the people no one ever goes to jail. The future of humanity is at risk and all the agencies seem to do is try and postpone, delay and refuse to really impose penalties against the Lehigh Southwest Cement and Quarry and the Stevens Creek Quarry. When there is any kind of fine most of the money goes back to the Government. Santa Clara County even refuses to impose a fine on Lehigh because of the tax revenue and the property tax revenue they receive each year. The public is not so blind that we do not see what is really taken place.

The biggest problem we face here in the Silicon Valley is that Lehigh Southwest Cement and Quarry run out of limestone and decide to put in a new quarry pit which will destroy 30 thousand trees and 600 acres of land. This will also destroy the homes for many animals who live in th

Please remember there is no one who is immune to cancer and the other health problems we are or will be all suffering. Cancer cases are at epidemic levels everyone will be getting it and the other serious illnesses. The human race will be lost if we do not change the way we do business and save the planet it is our home the only one we have and everyone needs to be involved. The planet will be here in 50 years but will the human race I suppose that is up to each and every one of use to start to SAVE THE PLANET NOW!

I hope that the Air District will really take the time to not only read my comments but that they will also ask the same questions and use the information to change the way that they think about pollution. I also hope anyone reading my comments will get even more involved and also that you will be telling and helping others to do the same.

Please save the Silicon Valley and the SF Bay area from the Lehigh Southwest Cement and Quarry and the Stevens Creek Quarry by creating a movement to shut them down. My dream is to have the State or Federal Government buy the properties via eminent domain, issue a Super Fund Cleanup, and then turn the properties into State and Federal Parks. I would like to address the public if you are reading my comments and feel the same way I do please contact your State and Federal Representatives.

Thank you,

Communities for a Better Environment

Sierra Club San Francisco Bay Chapter

350 Bay Area

Asian Pacific Environmental Network

Sunflower Alliance

Richmond Progressive Alliance

Crockett-Rodeo United to Defend the Environment

Benicians for a Safe and Healthy Community

Rodeo Citizens Association

Interfaith Climate Action Network of Contra Costa County

Community Science Institute—CSI for Health and Justice!

Greenaction for Health and Environmental Justice

California Nurses Association

11 November 2016

Eric Mar, Chair of the Board
John Gioia, Stationary Source Committee Chair
Members of the Board of Directors
Bay Area Air Quality Management District
375 Beale Street, Suite 600
San Francisco, CA 94105

Attention: Jack Broadbent, Air Pollution Control Officer
Gregory Nudd, Air District staff
Eric Stevenson, Air District staff
Victor Douglas, Air District staff

Re: **Initial Study (IS) Released 14 October 2016 and Draft Staff Report (DSR) Released 27 October 2016 for Proposed Rules 12-16 and 11-18, and Request for Comment on Scope of California Environmental Quality Act (CEQA) Review**

Dear Chair Mar, Committee Chair Gioia, and Board members,

Communities for a Better Environment (CBE), the Sierra Club, 350 Bay Area, the Asian Pacific Environmental Network (APEN), the Richmond Progressive Alliance (RPA), the Sunflower Alliance, Crockett-Rodeo United to Defend the Environment (C.R.U.D.E.), Benicians for a Safe and Healthy Community, the Rodeo Citizens Association (RCA), the Interfaith Climate Action Network of Contra Costa County, the Community Science Institute—CSI for Health and Justice!, Greenaction for Health and Environmental Justice, and the California Nurses Association (CNA) comment on the Initial Study, Draft Staff Report, and request for scoping comment cited above in support of proposed Rule 12-16.

Introduction

Oil refining is the largest industrial emitter in the Air District's jurisdiction of the most harmful types of air pollution known—fine particulate matter and greenhouse gases. Four years ago the Air District admitted there is ***no limit*** on refinery-wide emissions, found refining lower quality oil could ***increase*** refinery emissions, and planned to set up, by June 2013, a backstop to ***prevent*** that foreseeable emissions increase. The enforceable emission limits in proposed Rule 12-16 would "cap" these emissions to set that backstop. Setting these limits is urgent as the oil industry's push to build long-lasting infrastructure for inherently higher-emitting grades of oil threatens imminent and irreversible harm.

We appreciate the District staff's recent work to develop the specific numeric limits now proposed in Rule 12-16, and the Board's direction to its management to complete a full analysis of this measure. Rule 12-16 is reasonable, effective, a necessary complement to other air quality and climate protection measures, and urgently needed. It would close a gaping loophole that has left facility-wide emissions from oil refineries unlimited. It is needed to prevent the biggest industrial emitters of the most harmful air pollutants known from causing severe and irreversible climate and health impacts by locking in bottom-of-the-barrel oil infrastructure that could increase those emissions for another generation.

However, the Initial Study and Draft Staff Report released by District staff management present grossly inaccurate, biased, and misleading analysis that must be corrected. They assert conclusions regarding the need for Rule 12-16, its effectiveness, and your authority to adopt it that are proven false by factual information they fail to disclose or analyze. Worse, as we document herein, this crucial information that is omitted and ignored includes facts the District already knew, and even its own previous findings.

Oil industry pressure has affected the timing and transparency of this rule development process. Air District staff management has long delayed this urgent measure to keep refinery emissions from increasing, telling the public only that it was explaining secretly, in closed sessions with its Board, why it agreed with the oil industry's claim that refinery emissions must be allowed to increase. Now the excuse for that delay appears to be only the false conclusion of analysis biased by systematic nondisclosure of relevant facts.

As you know, the Air District Board has directed its staff to complete a full analysis and rule development package for Rule 12-16 that the Board can properly consider for adoption as expeditiously as possible. We hope to stand with the Air District Board in continuing to demand disclosure and consideration of all information that is relevant to a full analysis of this measure, as required by scientific principles and the California Environmental Quality Act (CEQA).

The Air District developed Rule 12-16.

Finding that a switch to lower quality grades of oil could increase refinery emissions significantly, the Air District initiated rulemaking to set a "backstop" against increasing refinery emissions in 2012[1] and resolved to develop Rule 12-16 for this purpose in 2014.[2] After considering extensive public comment on many options for this backstop, the Air District decided to consider setting the performance-based emission limits now proposed. Meanwhile, this air district and others had already been managing and updating their criteria for the facility health risk assessment and risk reduction program contemplated by proposed Rule 11-18, for decades, pursuant to the state law that established this program, and without the need for rules like Rule 11-18.[3]

Concealing these facts,[4] the Initial Study (IS) and Draft Staff Report (DSR) label Rule 12-16 as a recommendation by "CBE and associated organizations" only, and Rule 11-18 as the District staff's new idea. This error presents an incomplete, inaccurate, and biased description of the rules that hides information about the need for them, the Air District's role in developing them, and its multi-year rulemaking record for Rule 12-16 that must be known to complete accurate analysis under CEQA.

Rule 12-16 addresses extremely harmful air pollution.

Particulate matter (PM) and greenhouse gas (GHG) air pollution cause the worst current and potential local, regional, and global harm of all the air pollutants known. A strong scientific consensus holds that failure to curb GHG emissions quickly could lead to climate impacts so extreme that human societies as we know them might become untenable,[5] and the Air District itself has reported elsewhere that:

> Exposure to $PM_{2.5}$ is by far the leading public health risk from air pollution in the Bay Area, accounting for more than 90 percent of premature mortality related to air pollution. *Bay Area Air Quality Management District, 2016.*[6]

Incredibly, the IS and DSR fail to disclose the full extent of known and potential PM and GHG impacts, even though Rule 12-16 would limit GHG and PM air pollution. These extremely severe existing and potential effects must be disclosed in CEQA review. Moreover, this error inserts a further bias into the IS and DSR analyses because the approach they inappropriately portray as an alternative to Rule 12-16, proposed in Rule 11-18, does not control GHG or $PM_{2.5}$.[7] The DSR simply cannot credibly conclude, as it purports to conclude in this inappropriate comparison, that preventing increases in the most harmful emissions is less protective than allowing those emissions to increase.

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[1] Regulatory Concept Paper, Petroleum Refining Emissions Tracking Rule. Draft: May 30, 2012.

[2] Resolution 2014-07, adopted unanimously by the BAAQMD Board 15 October 2014.

[3] *See* BAAQMD, 2013. Toxic Air Contaminant Control Program Annual Report 2013.

[4] Such errors were not corrected despite prior comment: *See* CBE's 11 Sep. 2016 comments.

[5] *See* Fifth Assessment Report (AR5), Intergovernmental Panel on Climate Change (IPCC), 2014.

[6] Draft Control Measure SS1: Fluid Catalytic Cracking in Refineries, 2016 Clean Air Plan and Regional Climate Protection Strategy (quoting the Air District's 2010 Clean Air Plan).

[7] Nearly thirty years after the State Toxic Hot Spots Program began there is still no defined method for Rule 11-18 health risk assessments to include $PM_{2.5}$, as the DSR admits at 39.

Rule 12-16 limits exceptionally harmful polluters.

Oil refining emits more GHG and PM than any other industrial sector in the Bay Area.[8] Indeed, the summary figures in the DSR, indicating that the five major refineries here collectively emit 45% of $PM_{2.5}$, 34% of NOx, 51% of SO_2, and 38–67% of the GHGs[9] emitted by all industrial sources in the region combined, are consistent with this finding. But omitting this comparison of industrial sectors despite the fact that different sectors require different technologies and control measures, the IS and DSR obscure this finding.

The portrayal in the IS and DSR of refinery emissions as smaller than mobile source emissions presents an inaccurate and misleading comparison because it conflates source categories in two important ways. From a District rulemaking perspective, it ignores the fact that the District has authority to control refinery emissions, not tailpipe emissions. Equally important for environmental health and climate protection, it ignores the link between emissions from refiners' production and their products.

Accounting for the polluting products refiners profit from in competition with cleaner alternative fuels, even the DSR's partial estimates link Bay Area refineries to 46% of $PM_{2.5}$, 87% of NOx, 57% of SO_2, and 56% of the GHGs[10] emitted by all sources in the region. From the perspective of preventing unsustainable and irreversible climate impacts, these figures indicate that achieving the 40% emissions cut required by 2030 and the 80% cut required by 2050 could become impossible in the Bay Area if long-term increases in refinery emissions are allowed to become locked into place now. The need for refinery emissions control analysis to address this environmental effect context is beyond reasonable dispute, but the IS and DSR omit and ignore this context.

By protecting frontline communities Rule 12-16 protects everyone.

Abundant evidence in the District's rule development record demonstrates that refinery emissions disparately impact nearby low-income communities of color. Some examples:

- At a distance of 2.5 miles away the average areal emission intensity (e.g., tons/mile^2) of Bay Area refinery $PM_{2.5}$, NOx, and SO_2 emissions is 3–30 ***times*** that for ***all*** emission sources within the Bay Area, averaged over the region as a whole.[11]
- Peer reviewed measurements show that refinery emissions contribute significantly to locally elevated outdoor ***and*** indoor $PM_{2.5}$ air pollution concentrations outside ***and*** inside the homes of low-income residents of color in Richmond.[12]
- Analyses of Air District data link locally elevated hourly air concentrations of SO_2 and H_2S to episodic emissions from Bay Area refineries.[13]

[8] Based on District and ARB data: See CBE et al. 9/21/15 comments in rules 12-15/12-16 record.
[9] GHG range accounts for GHG from electricity generation elsewhere to supply the Bay Area.
[10] GHG estimate accounts for GHG from electricity generation elsewhere to supply Bay Area.
[11] Based on District emissions data: See CBE 11/23/15 comments in rules 12-15/12-16 record.
[12] See CBE 11/23/15 comments in rules 12-15/12-16 record, and Attachment 44 thereto.
[13] See CBE 11/23/15 comments in rules 12-15/12-16 record, and attachments 45 and 46 thereto.

- Refineries are strong sources of ultra-fine PM that, compared with coarser PM, has a more toxic composition, penetrates deeper into the lungs, bloodstream and cells, and is more abundant and concentrated in ambient air near its sources.[14]
- Fallout from large, visibly unmistakable "black smoke" PM plumes caused by Chevron's Richmond Refinery Crude Unit fire of 6 August 2012 forced ≈ 15,000 people to seek emergency room care in Richmond and surrounding communities.[15]

Ignoring all this evidence, however, the IS and DSR argue against significant localized impacts of refinery emissions, asserting a grossly incomplete and inaccurate analysis that insists on misleading "facts" based on assumptions the District knows to be false. The District knows that accurate analysis of the dispersion of emitted pollutants in the ambient air must account for the amounts of those pollutants emitted, but the IS omits and ignores this source-strength factor despite prior comment[4] pointing out the error. Correcting this error would reverse its false conclusion that the emissions accumulate only in the ambient air of the region's inland valleys instead of accumulating in those locations ***and*** near the bayside refineries, in nearby residents' ambient and indoor air.

Worse, the District knows its regional ambient air monitoring network was not designed to measure, and does not measure, air hot spots near refineries and other strong emission sources reliably and accurately—but the DSR asserts that these regional monitors do just that in its false argument against significant localized refinery emission impacts. This is the same error that led Air District management to assert that Chevron's August 2012 fire caused no significant air quality impact while thousands rushed to hospitals choking on Chevron's air pollution. The regional monitors were not set up to measure the local air impacts of that incident and did not measure those impacts.[16] In fact, the District decided to make the refiners pay for new monitoring of nearby ambient air based on its own findings[17] that its regional monitors do ***not*** say what the DSR now claims they say.

Rule 12-16 prevents clearly foreseeable harm.

The Air District has ample evidence to support its finding[2] that a switch to lower quality oil threatens to increase refinery emissions significantly. Peer reviewed science shows that the severe processing needed to maintain engine fuels production from lower quality oil increases refinery energy intensity, thereby increasing refinery emissions of combustion products including GHG, PM, NOx, and SO_2.[18] Refining greater amounts of bitumen-derived "tar sands" oil would further lower the quality of the average Bay Area refinery crude feed.[18] The oil industry reports plans to refine more tar sands oil here,[18] and multiple projects for new or modified infrastructure enabling those plans have been proposed for imminent construction across the regional oil industry.[19]

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[14] *See* CBE 10/21/15 and 11/23/15 comments in the rules 12-15/12-16 record, including attachments 6, 42 and 43 and *esp*. 4 (Air District corroboration of these findings).
[15] *See* CBE 11/23/15 comments in the rules 12-15/12-16 record, *esp*. Attachment 47 thereto.
[16] *See* San Pablo–Rumril Station data (https://www.arb.ca.gov/adam/weekly/weeklydisplay.php).
[17] *See* Rule 12-15 rulemaking record.
[18] *See* CBE 10/21/15 comments in the rules 12-15/12-16 record, including attachments thereto.
[19] *See* CBE et al. 6/10/16 comments in the rule 12-16 record, and BAAQMD permit files.

Further wounding the Air District's credibility, however, the IS and DSR dispute the District's own finding that an oil switch now threatens to increase refinery emissions significantly[2] by dismissing the likelihood, severity, and timing of this threat while omitting and ignoring the evidence the District possesses that supports this finding. The IS only mentions the objective of Rule 12-16 to prevent potential increases in refinery emissions due to changes in refinery oil feed quality (twice: see IS at 1-3, 1-10), omitting and ignoring evidence in the District's record and even this finding. The DSR's cursory discussion of this potential toxic and climate threat goes further, labeling the threat only theoretical and small (DSR at 6, 8), and omitting the potential emission impacts and benefits from preventing these impacts from its analysis, then falsely concluding that Rule 12-16 would have little or no benefit. (DSR at 20, 24, 39, 40).

Again, the IS and DSR improperly omit and ignore evidence the District already has that, when properly reported and analyzed, reverses their false conclusions about Rule 12-16.

Rule 12-16 prevents irreversible harm.

Allowing refinery emissions to continue at current rates or to increase through 2030–2050 could foreclose the opportunity to meet critical climate and health protection targets in the Bay Area. (See page 4 above.) Crucially, the "infrastructure inertia" created by major capital projects for new fossil fuel plants represents a commitment to new and continuing emissions for 30–50 years,[20] a dead-end in the path to a sustainable climate,[21] and a fundamental threat to future generations' environment and economy.[22] The District has acknowledged that Bay Area refineries are likely to switch crude slates,[23] that a switch to higher-emitting oil could be inextricably linked to new infrastructure projects[24] like those they now plan,[25] and that this new refinery infrastructure can be expected to have the capacity to operate for several decades.[26]

Thus, enabling the industry's planned switch to higher emitting oil feedstock and the long-lasting new infrastructure to refine it by allowing refiners' emissions to increase now could result in irreversible climate and health impacts. Therefore, one of the key objectives of proposed Rule 12-16 is to:

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[20] See Davis et al., 2010. Future CO_2 emissions and Climate Change from Existing Energy Infrastructure. *Science* **329:** 1330–1333. DOI: 10.1126/science.1188566.

[21] See Williams et al., 2015. *Pathways to Deep Decarbonization in the United States;* Energy+ Environmental Economics (E3). California ARB Chair's Presentation Series, 13 May 2015.

[22] Professor Lord Stern's 28 October 2016 speech to the Royal Society entitled *The Criticality of the Next 10Years: Delivering the Global Agenda and Building Infrastructure for the 21st Century.*

[23] 2016 CAP Draft Measure SS9 ("crude slates being refining by Bay Area refineries have been changing recently, and they are expected to continue to change in the future as California's crude oil resources start to become depleted and refineries look to other sources of crude oil.")

[24] See DSR at 8 ("The refineries would likely need to make changes to their facilities in order to accommodate different sources of crude oil with different compositions while maintaining current production levels.")

[25] See CBE et al. 6/10/16 comments in the rule 12-16 record, and BAAQMD permit files.

[26] Id. (esp. project descriptions in EIRs that BAAQMD permits are based upon).

> Compliment other climate, health, and safety measures, by ensuring that new commitments to long-lasting infrastructure for refining higher-emitting and more hazardous oils, which could foreclose the long-term emission reduction and safety potential of these other measures, will not be encouraged or enabled by allowing Bay Area refinery GHG, PM, NOx, or SO_2 emissions to increase.[27]

Despite purporting to compare Rule 12-16 with other policies which would not close the loophole allowing refinery-wide emissions to increase, and would thereby allow this infrastructure inertia impact, the IS and DSR ignore this irreversible impact, omit any analysis of infrastructure inertia, and fail even to mention[4] the objective quoted above.

Rule 12-16 is a necessary complement to other policies.

Rule 12-16 would set numeric limits on facility-wide emissions of GHGs, $PM_{2.5}$, PM_{10}, NOx, and SO_2 from refinery energy use at levels that prevent any significant increase in those emissions, thereby supporting the ability of other policy measures to cut harmful air pollution. The IS and DSR, however, present a false comparison of this rule with those other policies that is based on incomplete, inaccurate, and misleading analysis.

First, the IS and DSR omit a key fact that the District knows: ***no*** other policy sets any limit on facility-wide mass emissions from any Bay Area refinery.[1] Thus, no other policy addresses the irreversible refinery infrastructure emissions impacts described above,[20–27] which the IS and DSR also fail to disclose. These omissions obscure a unique and critical role of Rule 12-16 among air quality, environmental health and climate policies.

Second, the IS and DSR assert potential impacts of Rule 12-16 based on incomplete, misleading, and false comparisons with New Source Review (NSR) and cap-and-trade. NSR may not detect emissions increases from refining lower quality oil[28] and exempts too many refinery sources to prevent the significant increases in facility-wide emissions switching to lower quality oil could cause, necessitating a backstop against increasing refinery emissions,[1] District staff has found. Rule 12-16 would set such a backstop. California's cap-and-trade policy allows refineries to increase emissions using credits, gives them credits free, and is not authorized beyond 2020,[29] so it cannot address the irreversible infrastructure impacts Rule 12-16 addresses. Further, unlike Rule 12-16, cap-and-trade does not provide multi-pollutant combustion emissions control, which District staff has found to be more effective and efficient than pollutant-by-pollutant measures.[30] Finally, AB 197 requires prioritizing efficient direct control measures—like Rule 12-16.

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[27] See CBE's 11 Sep. 2016 comments on the draft Rule 12-16 project description at page A-8.

[28] 2016 CAP Draft Measure SS9 at 2 (modifications to change crude slates "may be difficult or impossible for the Air District [and the public] to discover … Refineries are complex operations, and any modifications associated with crude slate changes may be relatively subtle and not immediately obvious. ... Air District staff is investigating potential amendments to … include any significant crude slate change" among the triggers for NSR review of such modifications.)

[29] See ARB's *Preliminary Draft Proposed Regulation Order and Staff Report* dated 1 July 2016.

[30] See 2016 CAP Draft Measure SS11 at 2.

The IS and DSR omit and ignore all of this information which, when considered, reverses their inaccurate conclusion that Rule 12-16 could conflict with NSR and cap-and-trade.

Third, the IS and DSR present a false comparison of the proposed rules' effectiveness. Proposed Rule 11-18 would not address emissions of PM or GHGs that Rule 12-16 would address. Equally important, Rule 11-18 could not prevent the imminent and potentially severe emission impacts that Rule 12-16 could prevent, because Rule 11-18 would use a reactive approach that waits for further health assessments before beginning, well after 2020, to consider applying emissions control. The IS and DSR omit and ignore this information that shows Rule 11-18 cannot substitute for Rule 12-16—a fact that reveals their analysis assuming the opposite to be a false comparison.

Finally, the IS and DSR omit the District's own findings indicating that the refinery-wide emissions backstop now proposed as Rule 12-16 is a necessary complement to other rules that seek to reduce emissions from selected refinery sources.[2] Simply put, preventing increases in refinery-wide emissions complements the other measures by allowing them to reduce refinery emissions incrementally over time and enhancing their ability to do so. Indeed, the District Staff's projection that these other measures will reduce refinery-wide criteria pollutant emissions by approximately 15 % that is reported in the DSR[31] ***relies*** on this backstop—another fact that the IS and DSR obscure by omitting District findings.

Rule 12-16 is reasonable.

Rule 12-16 would allow each refining facility to emit up to 107 % of its actual maximum annual emissions over the most recent five-year period when its emissions were reported. Reported production by Bay Area refineries reached 97.7 % of their maximum crude capacity during this period,[32] they produced more gasoline and diesel than needed here and exported significant amounts of these fuels to foreign countries in this period,[33] and other adopted measures are expected to reduce emissions from these refineries.[31] Thus, Rule 12-16 itself would not be expected to require any change in refinery equipment, operation, workforce, production rate, or fuel supply. But despite these facts, and failing to disclose many of them, the IS and DSR paint this measure as unreasonably risky.

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[31] DSR at 9 (recently adopted measures projected to cut refinery-wide criteria emissions by 15%).

[32] The California Energy Commission reports gross crude oil receipts for processing by the five Bay Area refineries of 292.347 million barrels in 2014 and 285.412 MM b in 2015 (Per. comm., G. Schremp, CEC to G. Karras, CBE, 3 Aug 2016: forwarded to BAAQMD on 8 Sep 2016); the U.S. Energy Information Administration (a source the DSR relies upon) reports total operable capacity of atmospheric crude distillation units (b/cd) at these five refineries was 299.253 MM b in 2014. (EIA Refinery Capacity Report as of 1 Jan 2015.) Their operable crude utilization rate, defined by EIA as this gross input divided by this operable capacity, was thus 97.7 % in 2014.

[33] Bay Area refineries exported an average of 74,500 b/d of gasoline and diesel in 2013 (EIA data reported to BAAQMD by CBE on 25 Apr 2016) and produced these fuels at total rates averaging 611,880 b/d in 2014 and 2015 (CEC data reported to BAAQMD on 25 Apr and 19 Oct 2016), suggesting they currently export roughly 12 % of their combined gasoline and diesel production. Excess Bay Area refinery production accounted for 96 % of all gasoline exports from California refineries during the first 8 months of 2016 (CEC data reported to BAAQMD on 19 Oct 2016).

The DSR states that Bay Area-specific refinery production data are not available, that Rule 12-16 "may constrain" the domestic fuel supply market, and that this constraint would have worsened a "dramatic" gas price spike during the Torrance refinery outage in 2015. (DSR at 22, 23.) All of these statements appear inaccurate and misleading. The District had these specific data.[32–33] These data show that Rule 12-16 would allow Bay Area refineries to process ***more*** crude than they processed during the 2015 outage,[32] use ***more*** of their production capacity than they can reliably use for long periods,[34] and collectively produce roughly 12 % ***more*** gasoline and diesel than the domestic fuel market demands from them.[33] Instead of falsely blaming gas price spikes on air quality rules, the IS and DSR should have evaluated the local and global emission impacts from this excess refinery production for export—impacts Rule 12-16 would help to curb.[4]

Even though Rule 12-16 allows emissions at current rates, the IS and DSR also link it to "potentially significant" environmental impacts from the side effects of new equipment that they say it could require to reduce criteria pollutant emissions.[35] They do not explain why their analysis ignores the District staff's own finding that ***other*** recently adopted measures are projected to cut refinery-wide criteria pollutant emissions by ≈ 15 %,[31] or how Rule 12-16 itself would require new equipment to reduce emissions that already would be 15–22 % below[36] its applicable emission limits.

A major switch to refining lower quality oil or to increasing production for export would have to overwhelm the already-required emission reductions before Rule 12-16's PM, NOx, or SO_2 limits might be exceeded—and these scenarios, while clearly foreseeable, would require major infrastructure projects.[18–26] Rule 12-16 would prevent severe and irreversible emission impacts in these scenarios. Further, because it would prevent increased emissions it would discourage such harmful projects and encourage projects using lower-emitting production systems, thereby encouraging the prevention of the types of emission mitigation side-effects the IS asserts. Finally, and also ignored by the IS and DSR,[4] these emission impact prevention, irreversible impact prevention, and new emission mitigation impact prevention effects are among the objectives and intended results of Rule 12-16.

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[34] Compare note 32 above (2014 Bay Area refinery capacity utilization of 97.7 %) with the DSR at 23 ("Peak refining utilization [on a weekly basis at West Coast refineries from 2010–June 2016] appears to be about 93.5 percent. Given the few times when that peak was achieved, it's unlikely to be sustained over a long period due to unplanned outages and planned maintenance.").
[35] *See* IS at 2-40 (SCR equipment assumption) and 2-46 (wet scrubbing equipment assumption).
[36] Low end of 15–22% range based on other rules' reduction; high end (22%) also includes the 7% "operating variation" included in calculation of Rule 12-16 limits (*see* § 12-16-302).

Conclusion

Rule 12-16 is reasonable, effective, a necessary complement to other air quality and climate protection measures, and urgently needed. It would close a gaping loophole that has left facility-wide emissions from oil refineries unlimited. It is needed to prevent the biggest industrial emitters of the most harmful air pollutants known from causing severe and irreversible climate and health impacts by locking in bottom-of-the-barrel oil infrastructure that could increase those emissions for another generation.

However, the Initial Study and Draft Staff Report released by District staff management assert conclusions regarding the need for Rule 12-16, its effectiveness, and your authority to adopt it that are proven false by factual information they fail to disclose or analyze. Worse, as we document herein, this crucial information that is omitted and ignored includes facts the District already knew, and even its own previous findings.

Oil industry pressure has affected the timing and transparency of this rule development process. Air District staff management has long delayed this urgent measure to keep refinery emissions from increasing, telling the public only that it was explaining secretly, in closed sessions with its Board, why it agreed with the oil industry's claim that refinery emissions must be allowed to increase. Now the excuse for that delay appears to be only the false conclusion of analysis biased by systematic nondisclosure of relevant facts.

As you know, the Air District Board has directed its staff to complete a full analysis and rule development package for Rule 12-16 that the Board can properly consider for adoption as expeditiously as possible. We hope to stand with the Air District Board in continuing to demand disclosure and consideration of all information that is relevant to a full analysis of this measure, as required by scientific principles and the California Environmental Quality Act.

Respectfully,

Andrés Soto and Greg Karras
Communities for a Better Environment (CBE)

Luis Amezcua
Sierra Club San Francisco Bay Chapter

Richard Gray
350 Bay Area

Ratha Lai
Asian Pacific Environmental Network (APEN)

Janet Scoll Johnson
Richmond Progressive Alliance (RPA) *continued*

Steve Nadel, Charles Davidson, and Earl Koteen
Sunflower Alliance

Nancy Reiser
Crockett-Rodeo United to Defend the Environment (C.R.U.D.E.)

Katherine Black
Benicians for a Safe and Healthy Community

Janet PyGeorge
Rodeo Citizens Association (RCA)

Rev. Will McGarvey
Interfaith Climate Action Network of Contra Costa County

Denny Larson
Community Science Institute—CSI for Health and Justice!

Bradley Angel
Greenaction for Health and Environmental Justice

California Nurses Association (CNA)

Copy: Clifford Rechtschaffen, Office of Governor Edmund G. Brown
Richard Corey, California Air Resources Board
Refinery Action Collaborative of Northern California
Interested organizations and individuals

California Council for Environmental and Economic Balance
101 Mission Street, Suite 1440, San Francisco, California 94105
415-512-7890 phone, 415-512-7897 fax, www.cceeb.org

December 2, 2016

Mr. Victor Douglas
BAAQMD
375 Beale Street, Suite 600
San Francisco, CA 94105

RE: Proposed Regulation 11, Rule 18 and Regulation 12, Rule 16

Dear Mr. Douglas,

We appreciate the opportunity to submit these comments on behalf of the California Council for Environmental and Economic Balance. CCEEB is a non-profit and non-partisan coalition of business, labor, and public leaders that advances strategies for a sound economy and a healthy environment. We have many members that operate facilities in the air basin and are subject to proposed Regulation 11, Rule 18 (Reg. 11-18). CCEEB has been active in this rulemaking since July, and we thank staff for expanding its outreach to stakeholders over the past couple of months. Reg. 11-18 is a significant new rule and will likely have significant compliance costs for many businesses. We offer a number of initial questions and suggestions on Reg. 11-18 below, and look forward to working with staff to further refine this rule.

In terms of proposed Regulation 12, Rule 16 (Reg. 12-16), CCEEB must repeat our concerns as stated in our letter to you from September 9, 2016, and we include by reference those comments here. Additionally, CCEEB agrees with analysis in the draft staff report that calls into question the District's authority to implement Reg. 12-16. We include in our comments here more details about our reasoning for this position.

Comments on Regulation 11, Rule 18

<u>Clarify Authority in Staff Report</u>

In meetings with stakeholders, staff has explained that Reg. 11-18 is not based on District authority under AB 2588, the Air Toxics "Hot Spots" Information and Assessment Act (1987), and as such, it differs from the statewide program codified in Sections 44300-44394 of the California Health and Safety Code. CCEEB asks that staff clarify its authority for Reg. 11-18 and identify the relevant state and federal codes, particularly those sections related to establishing Best Available Retrofit Control Technology for Toxics (TBARCT). We note that other air districts in California continue to regulate existing facilities under AB 2588, based on regularly updated emission inventories and health risk assessments (HRAs), in addition to review of new and modified sources under New Source Review.[1]

Provide Opportunity for Facilities to Conduct HRAs and Enhance Review Process

The October 14, 2016 Initial Study for Reg. 11-18 indicates the District will use independent contractors to conduct HRAs due to a lack of staff resources necessary to carry out this work. CCEEB recommends that Reg. 11-18 be revised to provide an opportunity for facility operators to voluntarily conduct and submit HRAs for the purposes of complying with the rule. Any facility-submitted HRA would follow District HRA guidelines and be subject to review and approval by District staff. The advantages of facility-submitted HRAs are efficiency and accuracy; facility operators will have detailed knowledge of and data on equipment, operations, emissions monitoring and modeling, inventory reporting, emission factors, proximity of workers and nearby residents ("receptors"), and local meteorology. Such facility-specific information would help facilitate the efficient and accurate preparation of HRAs. Should staff find it necessary to reject a submitted HRA, the District could require the facility to resubmit the HRA with amendments.

Allowing facilities to conduct and submit HRAs is a standard practice. For example, Regulation 2-5-401 requires a permit applicant to submit an HRA, following the District's HRA guidelines. Similarly, under AB 2588, the state Legislature requires facilities to submit HRAs (H.&S.C. Section 44360(b)(1)). CCEEB believes that facility-submitted HRAs would in no way diminish the stringency or transparency of Reg. 11-18; rather, it would increase transparency, streamline the review process, and focus staff resources on reviewing HRAs or preparing HRAs for only those that choose to have the District do this analysis. Additionally, the BAAQMD could submit HRAs to the Office of Environmental Health Hazard Assessment (OEHHA) for review and comment, as is done under AB 2588 and H.&S.C. Section 44361.

Need Process to Reconcile Potential Disputes over Risk Reduction Plan Disapprovals

CCEEB wishes to work with staff to develop a dispute resolution process in cases when a facility needs to challenge or question a final action to disapprove a risk reduction plan. While we hope such instances would be rare in occurrence, CCEEB believes a dispute resolution mechanism is warranted given the unclear process to be used to make TBARCT determinations and the current lack of guidance available on what would be considered TBARCT for new and modified sources.

Explain Interaction of New Source Review Rules with Reg. 11-18

The District's New Source Review rules (Regs. 2-1, 2-2 and 2-5) require new or modified sources to apply for a project permit. Under Regulation 2, Rule 5 (Reg. 2-5), any source

[1] From the October 2016 Draft Staff Report (page 28): "The Air District adopted its Air Toxics New Source Review program at about the same time it started its activities to assess existing facilities under the Hot Spots Act. As a result, sources that existed in the late 1980's have been reviewed under the Hot Sports program and sources that were constructed or modified after the late 1980s have been reviewed under the Toxics NSR program."

with an estimated risk greater than 1-in-a-million and/or a chronic hazard index greater than 2.0 would be required to apply Best Available Control Technology for Toxics (TBACT).

Proposed Reg. 11-18 would require an existing facility to reduce risks below 10-in-a-million. To do so, a facility would likely need to apply for an NSR permit for a new or modified source, which in turn could trigger TBACT requirements. If a facility could not reduce below the Reg. 11-18 risk action levels, it would be required to install Best Available Retrofit Control Technology for Toxics (TBARCT) on all "significant sources," which, by definition, would also trigger TBACT under Reg. 2-5. We ask staff to explain how this process would work in practice, and to clarify whether a significant source would need to apply TBARCT, TBACT, or both.

Establish a Technical Working Group and Define TBARCT as Part of Rulemaking

CCEEB reiterates our request that the District establish a technical working group to help advise staff in developing a process to make TBARCT determinations and in defining TBARCT for specific sources. We believe such an effort is being planned, and thank staff for considering our past comments.

We also repeat our request that TBARCT be defined as part of the Reg. 11-18 rulemaking, as we see this as necessary for preparing the socioeconomic analysis as required by state H.&S.C. Section 40728.5, including analyses to determine the range of probable costs, the impact of the rule on regional employment and the economy, the availability of cost-effective alternatives, and the emission or risk reduction potential of the rule. Moreover, understanding what would be considered TBARCT helps inform regulated businesses as to what would be required under Reg. 11-18 and what compliance options would available to them, which in turn could prompt useful public participation and comments on the draft rule. This is especially important given that Reg. 11-18 is remarkable both in terms of the total number of facilities affected as well as the many different facility types that will become subject to the rule.

In addition, we note that the current unavailability of TBARCT guidelines discourages early actions to reduce risk. Facilities that take early action and install risk reduction technologies voluntarily in attempt to decrease risk below the notification thresholds could be burdened with additional cost if these reductions turn out later not to meet the TBARCT standard.

More generally, CCEEB believes that the District should allow adequate time to develop sound, scientifically based rules, and to conduct a fair and transparent public participation process. Conversely, we are concerned if rules are rushed to hearings before staff has fully developed implementation details and compliance pathways.

Modify Reference to MACT in Definition of TBARCT

Reg. 11-18 defines TBARCT as the most stringent of certain retrofit emission controls, including, "[t]he most stringent emission control for a source type or category specified as

MACT by U.S. EPA…" Reg. 11-18-204.4. "MACT" is simply defined as "[a]n emission standard promulgated by U.S. EPA pursuant to Section 112(d) of the Clean Air Act." [Reg. 11-18-212.] However, for many source categories that could be subject to Reg. 11-18, EPA has promulgated both new source and existing source MACT standards under Section 112(d) of the Clean Air Act. Clearly, the District's intent is that TBARCT can be no less stringent than an existing source MACT standard. However, TBARCT cannot and should not be defined in reference to new source MACT standards, which may be unachievable, infeasible, or prohibitively costly for existing sources subject to TBACT. CCEEB would ask that the District revise the definition to clarify that, for existing sources that have not previously been subject to the new source MACT standard promulgated by EPA for that source type or category, TBARCT shall be no less stringent than any relevant existing source MACT standard.

<u>Provide Public Information Templates as Part of Staff Report</u>

The draft staff report indicates that the District will provide facility information to the public via email notices, social media, the District's website, opt-in mailings, and community meetings. However, the draft report does not describe how these communications will be managed or what content will be provided. Risk communication is an important but too often contentious subject; context is key.

Facilities have a direct and significant interest in how their operations are viewed by their neighbors, and many have ongoing community outreach and public relations efforts. The District should be sensitive to this dynamic, and avoid risk communication that is confusing or unduly politicizes toxic risks. It is also critical that the District put risks from air toxics into context so that it is readily and clearly understood.

CCEEB requests that staff provide templates for how toxic risks from facilities will be described and communicated, such as through an appendix to the staff report. We also request that staff include in this simple background information, including but not limited to the degree to which risks from air toxics have been steadily decreasing in the air basin, the proportionate contribution of different source types (mobile, stationary, and area) to ambient risks, as well as an explanation of the difference between background or ambient risk and risk from a single, local source.

Finally, CCEEB recommends that facility information be limited to only those facilities above risk action levels, and that only final, District-approved documents be released. This helps interested public focus on facilities with the highest risks, rather than having to sort through documents for a 1000+ facilities, many of which may not pose real public health concerns. At a minimum, we ask staff to remove reference to draft HRAs since the preparation, review, and approval of HRAs follow strict, objective scientific guidelines and are not meant to be changeable or subjective based on public comments.

How Would APCO Shorten Risk Reduction Plan Time Periods?

Reg. 11-18-402.2 states that the APCO may shorten the three-year time period allowed to implement risk reduction plans if (a) the APCO finds that it is "technically feasible and economically practicable," or (b) the facility is in a CARE designated area and exceeds a significant risk threshold (i.e., either a cancer risk threshold of 1-in-a-million, a chronic HI of 0.20, or a acute HI of 0.20). CCEEB asks staff to clarify how the APCO would determine what is "technically feasible and economically practicable," and how or on what basis the APCO would determine the appropriate time period.

For facilities in CARE communities, how short would the time period be, and would it be the same for all facilities in those areas? Would the APCO use discretion, shortening the time period for some facilities but not others, or in some communities but not others, and if so, what criteria would these decisions be based on? What if a facility in a CARE community could not reduce risks in the shortened time period? Would an extension be needed? We note that CARE designations closely follow transportation corridors, congestion, and emissions of air toxics and other pollutants from mobile sources, particularly diesel particulate matter. In many cases, the incremental contribution of a stationary source facility could be de minimis.

What Would Prompt an Updated Risk Reduction Plan?

Reg. 11-18-405 gives the APCO the authority to require the facility to update its risk reduction plan "if information becomes available…regarding the health risks posed by a facility or emissions reduction technologies that may be used by a facility that would significantly impact health risks…" We ask staff to clarify this section in the rule and in the staff report. Specifically, we ask staff to explain what new information it is anticipating in regards to health risks. For example, is the concern that actual health risks are above what was estimated in the emissions inventory and HRA? And if so, what level of an increase would prompt the APCO to act? What happens if the increase was due to an increase in production but still within permit limits and the facility was on track to meet all Reg. 11-18 requirements?

In terms of "emission reduction technologies," does this mean that the APCO could force a facility to change its plan whenever a new control technology or risk reduction measure becomes available? What if risk reduction projects were already underway? What time period would be given to the facility, or would the clock restart after the updated plan was approved? Would the District determine economic impacts based just on the updated plan, or would it calculate total costs for the initial approved plan plus added costs for updating the plan? Could the APCO apply Reg. 11-18-405 multiple times, so that a facility was caught continuously updating a plan (and investing in risk reduction projects) whenever new technologies became available? What if the facility demonstrates that it will get below the risk reduction threshold in the time provided – could it then dispute the requirement to update its plan or seek a variance from the Hearing Board? CCEEB has serious concerns with this language as written and would like to better understand what is intended.

CEQA Analysis Should Include the Original 25-in-a-million Alternative

In July, staff presented a proposal for Board approval that set a first phase of Reg. 11-18 with a risk reduction threshold of 25-in-a-million. While we recognize that staff has revised its proposal and is no longer recommending the phased approach in the draft rule, we ask again that the 25-in-a-million option be included in the CEQA analysis as an alternative and that it be used to compare compliance costs and incremental health benefits, and to establish reasonable cost ranges in the socioeconomic report.

Comments on Regulation 12, Rule 16

District Staff Are Correct that Reg. 12-16 Would Be Inconsistent with District's Authority

The draft staff report provides staff's analysis that the fixed numeric caps on refinery emissions proposed by draft Regulation 12, Rule 16 are inconsistent with the requirements of the federal Clean Air Act (CAA) and California law. [*Draft Staff Report, Draft Regulation 12, Rule 16: Petroleum Refining Facility-Wide Emissions Limits and Draft Regulation 11, Rule 18: Reduction of Risks from Air Toxic Emissions at Existing Facilities*, Oct. 2016 ("draft staff report"), pages 17-20.]

In particular, staff notes that both the CAA and California law require permitting programs that allow for criteria pollutant emissions to increase at one location so long as those emissions are offset by reductions elsewhere. *Id*. at 17. CCEEB agrees with staff's analysis of this inconsistency. Additionally, by essentially imposing a construction moratorium upon refinery expansion when none is authorized or warranted under the CAA, Reg. 12-16 would stand as an obstacle to the accomplishment and execution of the full purposes of the objectives of Congress in enacting the CAA and designing a program for controlling emissions from new and modified sources. *See Hines v. Davidowitz*, 312 U.S. 52, 67 (1941).

As the draft staff report indicates, proposed Reg. 12-16 would address pollutants of primarily regional or global concern by limiting those pollutants from one particular sector, even though the concentrations of criteria pollutants are roughly the same in refinery communities as in other urbanized areas of the region. *See* draft staff report at page 18. California law imposes several requirements for new rules, including that the air district demonstrate the rule's "necessity" (Cal. Health & Saf. Code § 40727(b)(1)). The District would be challenged to demonstrate the necessity of a rule targeting an individual sector and its emissions, when the impacts from that sector are, as staff acknowledges, indistinguishable on a regional scale from those of other sectors. In light of the regional and global impacts associated with the emissions targeted by Reg. 12-16, CCEEB also agrees that the theoretical co-benefits associated with regulating criteria and greenhouse gas (GHG) emissions, so as to limit localized refinery communities' exposure to pollution (*see* draft staff report at page 20), cannot provide legal justification for such a rule.

CCEEB also agrees with staff that the Reg. 12-16 caps on GHG emissions would fail to satisfy state law because facility-specific caps are fundamentally inconsistent with the Air Resources Board Cap-and-Trade Program. *See* draft staff report at page 19. The State's Cap-and-Trade Program has been carefully designed to achieve the maximum technologically feasible and cost-effective reductions in GHG emissions through use of market forces, while also minimizing emissions leakage. *See* Cal. Health & Saf. Code §§ 38562(a), (b)(8). Placing caps on facilities in the Bay Area would frustrate the efficiency goals of the Cap-and-Trade Program, as recognized by District staff. *See* draft staff report at page 19 ("There is a fundamental inconsistency between a 'cap and trade' program that by its nature contemplates changeable caps versus one that fixes caps at one level, in that the latter has the potential to frustrate the efficiency goals of the former."). It would also potentially result in emissions leakage to sources elsewhere in the state or out-of-state, thus achieving no net reduction in GHG emissions. Even assuming the District were legislatively delegated the authority to promulgate such a rule, doing so would run afoul of the requirement that district rules must be consistent and in harmony with existing State law (*see id*. § 40727(b)(4)), and not be arbitrary, capricious, or without a reasonable or rational basis. *See S. Cal. Gas Co. v. S. Coast Air Quality Mgmt. Dist*., 200 Cal. App. 4th 251, 267-68 (2011).

CCEEB thanks staff for considering our comments on proposed Regulations 11-18 and 12-16 and we look forward to seeing your response. We also appreciate recent staff efforts to notify and engage potentially affected industry on Reg. 11-18, and we continue to support a full public participation process for rule development. CCEEB is committed to working with the staff and the Board of the District in refining Reg. 11-18 and addressing the questions and concerns we outline in this letter. Please contact me or Janet Whittick of CCEEB at any time should you have questions or wish to discuss our comments further. I can be reached at (415) 512-7890 ext. 115 or billq@cceeb.org; Ms. Whittick is available at ext. 111 or janetw@cceeb.org.

Sincerely,

Bill Quinn

Bill Quinn
CCEEB Chief Operating Officer and Bay Area Partnership Project Manager

cc: Mr. Jaime Williams, BAAQMD
Mr. Eric Stevenson, BAAQMD
Mr. Gerald D. Secundy, BAAQMD
Ms. Janet Whittick, CCEEB

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San Francisco Refinery
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December 2, 2016

ESDR-364-16
05-C-03-G

VIA Email

Mr. Victor Douglas (VDouglas@baaqmd.gov)
Manager, Rule Development Section
Bay Area Air Quality Management District
375 Beale Street, Suite 600
San Francisco, CA 94105

RE: Phillips 66 Company: Comments on BAAQMD's Notice of Preparation for DEIR Draft Regulation 12, Rule 16 and Draft Regulation 11, Rule 18

Mr. Douglas:

Phillips 66 Company (Phillips 66) is providing comments in this letter related to the Notice of Preparation (NOP) for two new Bay Area Air Quality Management District (District) rules currently being developed – Regulation 12, Rule 16: Petroleum Refining Facility-Wide Emission Limits (Reg. 12-16) and Regulation 11, Rule 18: Reduction of Risk from Air Toxic Emissions at Existing Facilities (Reg. 11-18).

In addition, Phillips 66 supports and adopts the comments of the Western States Petroleum Association (WSPA) and the California Council for Environmental and Economic Balance (CCEEB) on the above-referenced Regulations submitted on December 2, 2016.

Due to the complicated nature of the proposed Regulations referenced above, Phillips 66 requests that additional time be allowed to provide comments and work with District staff.

Regulation 12, Rule 16

The California Environmental Quality Act ("CEQA") requires that the District's Environmental Impact Report for the project consider the entire project. As you are aware, the CEQA Guidelines define a "project" to be the whole of an action, which in this case includes all regulations associated with Board Resolution 2014-07 targeting emissions reductions from refineries. .

Proposed Regulation 12, Rule 16 will likely curtail refinery production below levels already achievable in practice and currently permitted, which infringes on Phillips 66's vested rights. The proposed rule severely inhibits (or may altogether prevent) the ability of Bay Area refineries to build new equipment or process units that may be required to meet future Federal and/or California Air Resource Board (CARB) fuel standards or to respond to increases in demand. This may make one or more refineries obsolete and potentially force their closure.

The proposed rule is not necessary, and, in fact, District Staff itself recognizes the difficulty that the Board will have in making the finding of "necessity" required by California Health and Safety Code section 40727(a): "[a]t the very least, it would be difficult to legally justify the necessity for the [proposed rule]…" (*BAAQMD Draft Staff Report, Draft Regulation 12, Rule 16: Petroleum Refining Facility-Wide Emissions Limits* (October 2016), p. 17). Phillips 66 also believes that the Board will not be able to make the required finding of "consistency," which is a view shared by District Staff in the *BAAQMD Draft Staff Report* ("Staff is concerned that a fixed numeric cap on refinery emissions may not be consistent with requirements of the Federal Clean Air Act (CAA) and the California Health and Safety Code (H&SC)"). Further, the proposed rule is arbitrary and capricious in that it imposes a specific regulatory regime on one particular sector of the regulated community – *i.e.*, refining – without any support whatsoever that such disparate treatment is either necessary or appropriate. Again, this view is echoed by District Staff at pages 17 and 18 of the *BAAQMD Draft Staff Report* ("Staff is also concerned that there is no support for imposing a particular regulatory approach on one sector of the regulated community without factual support for such selective treatment").

Adoption of the proposed Regulation 12, Rule 16 would be beyond the Board's legal authority. District Staff has arrived at this same conclusion (*BAAQMD Draft Staff Report*, pages 3, 19, and 20). If the Board adopted this proposed rule, it would be a transparent attempt to utilize legislative authority that the Board does not rightfully have, which will have been hijacked by the Board solely to impose the Board's own purported policy choices on a discreet sector of the economy and regulated community.

The District needs to evaluate the environmental, socioeconomic and other factors associated with restricting refinery operations. The potential to affect fuel supply in the Bay Area must be thoroughly evaluated. For instance, the District must evaluate the GHG impacts of importing gasoline from outside the State or from foreign countries should a fuel shortage be caused or exacerbated by proposed Reg 12-16.

<u>Regulation 11, Rule 18</u>

The District must provide a thorough scientific justification for why a risk threshold of 10 in a million (10/M) was arbitrarily chosen. The District's own Community Air Risk Evaluation (CARE) study estimated that average background air quality in the Bay Area is roughly 50 times greater than the proposed risk threshold of 10/M. The District must determine if the Rule is implemented whether or not all reducing risk from all facilities to below 10/M would even have a significant effect on the overall risk from background air quality.

District staff had previously reported a 25/M risk threshold to the Board, but this threshold has been removed and replaced with the 10/M threshold without any explanation. Phillips 66 requests that District staff provide an analysis of the number of facilities with a risk greater than 25/M compared to the estimate of over 1,100 facilities with a risk of greater than 10/M reported in the *BAAQMD Draft Staff Report*. This information must be presented as part of the project alternatives and the EIR and staff report must analyze any additional benefits and costs associated with reducing the risk threshold from 25/M to 10/M. The District must show that these thresholds are necessary and cost effective.

The *BAAQMD Draft Staff Report* explains that the District will use the annual toxic emissions inventories reported to the District to conduct site-specific HRAs for sources that emit toxic compounds. Section 11-18-403.3, in turn, requires the Risk Reduction Plan to include a source characterization that includes "summary data from the applicable APCO-approved air toxic emission inventory." However, proposed Rule 11-18 provides no further clarity with respect to the emissions inventory component. To help ensure consistency in emission inventory and health risk assessment methods across facilities, Phillips 66 requests that Rule 11-18 clarify that the emission inventory is based on actual emissions.

The BAAQMD should provide guidance and a more thorough review of proposed Regulation 11, Rule 18 (Reg 11-18) in relation to the changes proposed to Regulation 2-5 and the recent changes to Regulation 2 Rules 1 and 2 (Regs 2-1& 2). These regulations will all potentially have effects on the other regulations and should be thoroughly reviewed to determine if there are any inconsistencies or other potential issues.

- For instance, potential risk reductions required by Reg 11-18 may require permits and review via Regs 2-1 & 2 and Reg 2-5. What are the effects if Reg 2-5 required TBACT on a project being conducted for Reg 11-18 compliance, when currently Reg 11-18 only requires TBARCT?
- What if a project is required by proposed Reg 11-18 risk reduction requirements but is not issued a permit pursuant to proposed Reg 2-5 because the potential to emit only for the project is included in the Reg 2-5 analysis? Is the facility then out of compliance with Reg 11-18?

TBARCT should be better defined as part of the Reg 11-18 rulemaking. Defining TBARCT is necessary to prepare the socioeconomic analysis and determine the range of probable costs, define the impact of the rule on regional employment and economy, determine the availability of cost-effective alternatives and quantify the emission or risk reduction potential of the rule. Moreover, this would help inform regulated businesses about what would be required and what compliance options are available, which in turn could prompt useful public participation and comments on the draft rule. The current definition of TBARCT in 11-18-204 does not adequately consider cost-effectiveness, as it requires installation of the most stringent retrofit emissions controls available.

As Sections 11-18-301 and 11-18-403.6 are currently written, they could be interpreted to mean that all sources of risk anywhere in the facility must be below the significant risk thresholds or have TBARCT. Based on conversations with District staff, Phillips 66 believes the intent of the Reg was to control only those sources of risk that affect the receptors with impacts above risk action levels in Section 11-18-214, not all sources at the facility. Accordingly, Philips 66 suggests the following edits to clarify the proposed text in Sections 11-18-301.2 and 11-18-403.6.1:

- 11-18-301.2 "Demonstrate to the satisfaction of the APCO that all <u>facility</u> sources of risk ~~at the facility~~ <u>that impact any receptor where the health risk from the facility exceeds one or more of the risk action levels in Section 11-18-214</u> either:
  - 2.1 Are controlled with current TBARCT, or
  - 2.2 Do not pose a health risk that equals or exceeds of one or more of the significant risk thresholds set forth in Section 11-18-217."

- 11-18-403.6.1 "A demonstration that all <u>facility</u> sources of risk ~~at the facility~~ <u>that impact any receptor where the health risk from the facility exceeds one or more of the risk action levels in Section 11-18-214</u> are either controlled with TBARCT, or do not pose a health risk in excess of the significant risk threshold, or"

Lastly, the District's choice of facility prioritization for implementation of the proposed Rule appears arbitrary. Multiple times in the *BAAQMD Draft Staff Report*, CARE communities are noted as the areas with the highest risk; however, the District did not consider the CARE communities when determining the prioritization. Further, diesel PM is the largest contributor to Bay Area risk as illustrated in Figure 5 of the *BAAQMD Draft Staff Report*, however, the primary stationary source of diesel PM emissions, diesel engines, are not proposed to be addressed by the rule until the third implementation phase, and reductions from these sources won't be implemented until 2024 at the earliest. The District should prioritize implementation of facilities that are located in CARE communities because they are the areas with the highest overall risk.

If you have any questions regarding these comments, please contact me at (510) 245-5825.

Sincerely,

D. Bristol

Don Bristol
Environmental Superintendent

Attachment

cc: Eric Stevenson, BAAQMD (via e-mail: EStevenson@baaqmd.gov)
Greg Nudd, BAAQMD (via e-mail: GNudd@baaqmd.gov)

Western States Petroleum Association
Credible Solutions • Responsive Service • Since 1907

Catherine Reheis-Boyd
President

December 4, 2016

Mr. Victor Douglas via email (vdouglas@baaqmd.gov)
Principal Air Quality Specialist
Bay Area Air Quality Management District (BAAQMD)
939 Ellis Street
San Francisco, CA 94109

Re: WSPA Comments on Draft Proposed Rules for Regulation 11, Rule 18 and Regulation 12, Rule 16

Dear Mr. Douglas:

The Western States Petroleum Association (WSPA) is a non-profit trade association representing twenty-six companies that explore for, produce, refine, transport and market petroleum, petroleum products, natural gas and other energy supplies in California, Arizona, Nevada, Oregon, and Washington. Our members in the Bay Area have operations and facilities regulated by the Bay Area Air Quality Management District (District).

WSPA has significant concerns with regard to the District's proposed Regulation 11, Rule 18 (Rule 11-18) and Regulation 12, Rule 16 (Rule 12-16), as described more fully in Attachments A and B. In addition, it is unclear whether the District intends to develop and propose both draft Rules to the Board for consideration, such that both Rules could presumably be adopted by the District, or whether the District intends to propose Rules 11-18 and Rules 12-16 as alternative suggestions for reducing emissions from petroleum refineries, such that only one of the two Rules would be adopted. To the extent that both rules may be adopted by the Board, the District needs to assess the impacts, feasibility, and costs of complying with both sets of requirements before proposing the draft Rules to the Board for adoption. In addition, WSPA requests that more time be allowed to provide comments on these proposals due to their complex nature and wide scope.

WSPA appreciates the BAAQMD's consideration of our comments and we look forward to your responses. If you have any questions, please contact me at this office, or Bob Brown of my staff at (925) 708-8679 or email bbrown@wspa.org.

Sincerely,

Attachments:

Attachment A: WSPA Comments on Proposed Regulation 11, Rule 18
Attachment B: WSPA Comments on Proposed Regulation 12, Rule 16

Attachment A
WSPA Comments on Proposed Regulation 11, Rule 18

CALIFORNIA HEALTH & SAFETY CODE REQUIREMENTS

The California Health & Safety Code requires the District to make six statutory findings before amending a rule: necessity; authority; clarity; consistency; nonduplication; and reference Cal. Health & Safety Code § 40727. As Rule 11-18 is currently drafted and structured, the District will not be able to meet these statutory requirements, particularly with respect to the elements of necessity, consistency, and clarity.

The Stringency of Draft Rule 11-18 is Not Necessary

Draft Rule 11-18 will require all facilities, including non-refinery entities, with a calculated risk level of 10 per million (10/M) to develop a Risk Reduction Plan to implement controls that will reduce the facility's risk level. The stated purpose of draft Rule 11-18 is to "ensure that facilities that emit toxic air contaminants do not pose an unacceptable health risk to nearby residents, workers, or students." § 11-18-101. However, the District has not explained why a risk of 10/M is the appropriate threshold for acceptable versus unacceptable risk. The District recognizes that Rule 11-18 is "more stringent than most" other air programs being implemented in California to address toxic emissions from existing facilities, but fails to explain the basis for regulating so much more stringently.

The District must provide a more reasoned and scientific explanation for its proposal to decrease the risk level of 10/M from the current risk level of 100/M for existing facilities. While Cal. Health & Safety Code §§ 39002 and 39013 provide the District with authority to control air pollution from stationary sources, the District must nevertheless balance that authority with the necessity of a rule. The District's Staff Report states that the risk action levels in § 11-18-214, which are based on the OEHHA's 2015 Health Risk Guidelines, "reflect the most health protective levels achievable and correspond to the health risk levels that the Air District uses for the existing 'Hot Spots' program." At the outset, the OEHHA itself has identified the risk levels proposed in the 2015 Health Risk Assessments Guidelines as conservatively *high* estimates of risk (because they take the most sensitive populations into consideration).[1]

More to the point, this reasoning does not explain why such conservative risk thresholds are necessary in light of the Bay Area's air quality, which the District itself has acknowledged has improved dramatically. As the Staff Report notes, over the last few decades TAC emissions from stationary sources in the Bay Area have decreased by 87%, and the average Bay Area risk from exposure to TACs has been reduced by 83%. Staff Report, at 25-26. Furthermore, these figures do not account for the additional reductions that will occur as WSPA's members implement the additional controls imposed over the past year through the District's Refinery Strategy, which the District has calculated will further reduce refinery emissions by 15%.

The District proposes to calculate a facility's health risk in accordance with OEHHA's 2015 Health Risk Assessment (HRA) Guidelines, which lower the risk screen trigger levels for carcinogenic TACs as compared to OEHHA's prior guidelines, and thereby result in higher risk calculations for the same level

[1] OEHHA's Guidance Manual for Preparation of HRAs identifies that "...there is a great deal of uncertainty associated with the process of risk assessment....The assumptions used in these guidelines are designed to err on the side of health protection in order to avoid underestimation of risk to the public....Risk estimates generated by an HRA should not be interpreted as the expected rates of disease in the exposed population but rather as estimate of potential for disease, based on current knowledge and a number of assumptions...."

of TAC emissions from regulated sources. At the same time, as discussed above, actual health risks associated with TAC emissions are lower than they have ever been within the District. Staff Report, at 25-26. This significant progress calls for a balanced approach to regulation. Indeed, other air districts with worse air quality (e.g., more criteria pollutants in non-attainment), including the South Coast and San Joaquin Valley Air Districts, have determined that a higher risk threshold is protective of human health given the recent changes in the OEHHA guidelines. The District should avoid inciting unnecessary confusion and fear among the public based on dramatically overstated risks or require installation of unnecessary controls for operations that do not pose actual significant risks to the public,, or if the added controls do not make a perceivable improvement in the overall risk of the area around the source. Analysis should also be completed on the effects of all the regulated facilities dropping to a risk less than <10/M to determine if these estimated reductions at stationary sources make any perceivable difference to the receptors.

WSPA believes that it is especially appropriate to reconsider the risk threshold in § 11-18-214.1, because, unlike the hazard indices which are based upon conservative estimates of the level of air pollution concentrations that might cause a health effect, the risk limit does not have a scientific basis. Past risk thresholds (including the District's existing 100/M threshold under AB2588) have been based on what regulators believed was possible for facilities to achieve. Along the same lines, the District claims that the 10/M level was chosen because it reflects "the most health protective levels achievable" (Staff Report page 30). However, the Staff Report does not provide any data or analysis to support this claim. Rather, the District here seems to simply assume that a 10/M will be "achievable" by existing facilities.

The District assumes too much. The achievability of reducing an existing facility's TAC emissions to below the 10/M risk level will depend on several factors, such as the District's definition of "source," its emission calculation methods, its dispersion models, its risk calculation models, and changes in acute and chronic reference exposure levels. If the District chooses to adopt hazard indices and risk thresholds that were derived based on what levels are "achievable," it must provide a thorough assessment documenting that those levels are in fact scientifically, technologically, and economically achievable under the proposed rule as written.

WSPA suggests that the District consider a risk reduction threshold for risk of 25/M. This value was reported to the Board initially on July 20, 2016 and later removed from consideration without any written analysis or justification. The District should further assess the feasibility and cost-effectiveness of a 25/M threshold, along with the incremental costs and benefits of going from 25/M to 10/M.

Draft Rule 11-18 is Not Consistent with the Proposed Amendments to Rule 2-5

WSPA requests revisions to Rule 11-18 for consistency with the proposed amendments to Regulation 2, Rule 5 (Rule 2-5). Rule 2-5 exempts new and modified internal combustion engines smaller than 50 hp and treats retail gasoline facilities differently; however these same sources either by themselves or in conjunction with other sources at the same facility could trigger the need for a Risk Reduction Plan under Rule 11-18. WSPA suggests that the District consider exempting sources from Rule 11-18 that were already subject to or listed as exempt from Rule 2-5. WSPA also requests revision to Rule 11-18 to allow similar treatment of gasoline dispensing facilities as under the proposed amendments to Rule 2-5.

In addition, draft Rule 11-18 is unlikely to provide any emissions reductions for certain existing source types that are already implementing analogous TBARCT controls for toxics. These source types would include retail gasoline dispensing facilities subject to BAAQMD Rule 8-7, and gasoline bulk terminals subject to BAAQMD Rules 8-5, 8-18, and 8-33. WSPA therefore suggests that the District consider exempting any facilities from draft Rule 11-18 that are already subject to requirements that reflect TBARCT.

Draft Rule 11-18 is Not Sufficiently Clear

Several of the provisions of proposed Rule 11-18 are not sufficiently clear to be understood, as required by Cal. Health & Safety Code § 40727(a) and (b)(3).

Applicability. The applicability of draft Rule 11-18 depends entirely on the District's calculation of a facility's health risk. With the exception of the requirement in § 11-18-401 for facilities to submit "any information necessary to complete an HRA of the facility" at the District's request, the draft rule does not describe the procedures, or limits, to the District's determination of applicability. The Staff Report explains that the District will use emissions inventory data to screen for facilities with a priority score of ten or greater or a non-cancer priority score of one or greater, and then conduct health risk assessments (HRAs) for those facilities in accordance with the most recent versions of OEHHA's HRA Guidelines, CARB AB2588, and the CARB/CAPCOA Risk Management Guidelines. In addition, the Staff Report suggests that facilities will be consulted to validate the HRA model and site-specific factors. None of this is apparent from the language of the draft rule. WSPA therefore requests that the District incorporate provisions in proposed Rule 11-18 that address the District's responsibilities and procedures for determining rule applicability. This would include clarifying that (i) the HRAs to be prepared by the District will be done consistently with the OEHHA 2015 Health Risk Assessment Guidelines, and (ii) facilities will be provided with an opportunity to review and comment on both the inputs to and results of HRAs prior to being required to submit Risk Reduction Plans. WSPA also requests that data in Table 2-5-1 of Rule 2-5 be referenced in Rule 11-18.

In addition, WSPA requests that the draft rule incorporate an HRA review process that provides sufficient time for source testing and ambient air testing, and that a Hearing Board appeal process be added to the rule's provisions, much like with permit determinations.

Absent input from facilities, the District may incorrectly characterize facility emissions and/or health risk, which could lead to the District requiring facilities to install control equipment on sources that testing may show do not pose a health risk.

Cargo Carrier Emissions. The District should clarify that emissions from cargo carriers (e.g., ships and trains) are excluded from draft Rule 11-18. As discussed in prior WSPA comments on the District's Refinery Strategy rules, most cargo carriers are owned and operated by other companies. Attempting to require facilities to incorporate emissions from cargo carriers into nearby refinery emissions inventories will likely produce inaccurate data. Furthermore, as currently drafted, § 11-18-204 specifically exempts cargo carriers from TBARCT requirements. As a result, including cargo carrier emissions in the emissions inventories of adjacent facilities may potentially trigger HRA and TBARCT requirements for the adjacent facility. and even though those sources themselves are in fact exempt from the control requirements. If the District is concerned about diesel particulate emissions from cargo carriers, please take into consideration that CARB is in the process of writing an ATCM that will reduce diesel particulate matter from cargo carriers.

Toxic Emissions Inventories. The Staff Report explains that the District will use the annual toxic emissions inventories reported to the District to conduct site-specific HRAs for sources that emit toxic compounds. Section 11-18-403.3, in turn, requires the Risk Reduction Plan to include a source characterization that includes "*summary data from the applicable APCO-approved air toxic emission inventory.*" However, proposed Rule 11-18 provides no further clarity with respect to the emissions inventory component. To help ensure consistency in emission inventory and health risk assessment methods across facilities, WSPA requests that Rule 11-18 state explicitly that the HRA will be completed with the most recent available facility reported actual site stationary source emission inventory. WSPA requests clarification that for refineries, the emission inventories will be done consistently with the District's refinery emission inventory guidelines, and that the same methods will be used across industries where applicable, such as emergency diesel engines.

Risk Action Levels/Risk Reduction Plan. During Rule 11-18 workshops, District Staff indicated that facilities would not be required to install TBARCT on all sources if controls could be installed to reduce health risks below the risk action levels in § 11-18-214. WSPA requests clarification that the Risk Reduction Plan may explain how a facility will reduce risk below the risk action level, rather than install TBARCT on all sources above the significant risk threshold.

Significant Risk Thresholds. The significant risk thresholds in § 11-18-217 are far below the risk action levels in § 11-18-214. As a result, it is likely that a source with risk above the § 11-18-217 thresholds nevertheless may not contribute to risk at a receptor above the § 11-18-214 facility-wide action level. WSPA requests clarification that TBARCT would only be required on sources that contribute risk greater than the thresholds in § 11-18-217 at receptors having risk above the action levels in Section 11-18-214.

WSPA's understanding of the language in §§ 11-18-301.2 and 11-18-403.6.1 is that the District's intent was that "*each permitted source at the facility that contributes to the risk at any receptors where the facility wide risk is above the risk action levels, is either controlled with TBARCT or does not pose a health risk in excess of any of the significant risk thresholds.*" As the draft rule is currently written, however, sources which have risk impacts below the significance thresholds in § 11-18-217 at the receptors with facility-wide risks above the risk action levels would require some type of emission control, even if they do not meet the significant risk thresholds. WSPA requests that the District modify the language of the draft Rule to clarify that TBARCT is not required on a source if the health risk from the source remains below the significant risk thresholds.

Summary Data. WSPA suggests removing from 11-18-403.3.2 the requirement to include summary data for data from the HRA in the Risk Reduction Plan. As the HRA is to be prepared by the District, a facility would need to request the information from the District (the source of the HRA), and then submit the information back to the District in the Plan.

Risk Reduction Plan v. TBARCT. Section 11-18-403.6 has subsections that are confusing and should be clarified. Sections 11-18-403.6.1 and -403.6.2 are linked with an "or" conjunction, however subsections -403.6.2 and -403.6.3 are linked with an "and" conjunction. It is unclear whether TBARCT is required by the due date of the Risk Reduction Plan or by three years from the date of Plan submittal if health risk cannot be reduced below the risk action levels; and if the District intends the former, it is very likely not possible to install TBARCT on all sources by the date of Plan submittal. Also, it is unclear how a facility would "*develop risk reduction measures…to comply by the specified date*" in § 11-18-403.6.3 when a facility demonstrates that compliance is technically infeasible or would result in an unreasonable economic burden. *See* § 11-18- 403.6.2. WSPA requests the District modify these subsections of the Rule to clarify its intent.

Definitions. The definitions in Rule 11-18 reference sources in other rules. If a definition changes in a source rule, it is unclear whether the definition in Rule 11-18 would change automatically. A source rule could potentially change without thorough consideration of effects on Rule 11-18. Thus, WSPA requests that the definitions in Rule 11-18 stand alone and the source citations be deleted from Rule 11-18.

TBARCT. WSPA requests that the District revise the definition of TBARCT to ensure that costs, non-air-quality impacts, and energy requirements are considered. As currently written, the definition of TBARCT outlines four methods by which TBARCT may be determined. One option (§ 204.3) expressly requires the consideration of costs, non-air-quality health and environmental impacts, and energy requirements. The other three do not. Thus, for example, § 204.1 would require use of the most effective technology that has ever been used successfully on that type of equipment, even if site-specific considerations make that technology economically infeasible, and even if the technology would have potentially damaging non-air impacts in an ecologically sensitive area. The District should revise the definition of TBARCT to ensure that all appropriate factors are considered in making the determination.

Section 11-18-204.4 should also be revised to clarify that the District is referring to the controls identified in a MACT standard or an ATCM are those for existing sources, not new sources. EPA's MACT standards for new and existing sources are based on entirely different data sets and impose different levels of control; the fact that EPA has concluded that a specific emissions limit is achievable for a new source that is designed to use a specific technology does not prove that an existing source can be retrofitted to achieve that same level of control (indeed, the persistence of less-stringent MACT limits for existing sources demonstrates that such retrofits are typically *not* possible).

At a broader level, the breadth and vagueness of the definition of TBARCT, and the lack of clarity regarding the District's ability to consider costs in this determination, makes it nearly impossible for the District to properly evaluate the costs associated with Rule 11-18, as currently drafted. Further, there is no indication of what the District may consider to be "technically infeasible" or pose an "unreasonable economic burden." Without much more clear explanation of the parameters of the proposed requirements, WSPA and its members will not be provided a reasonable opportunity to submit data and analysis supporting or opposing the economic and technical feasibility of the draft rule.

Exemptions. The proposed regulation is unlikely to provide any emissions reductions for certain existing source types that are already implementing analogous TBARCT controls for toxics. These source types would include retail gasoline dispensing facilities subject to BAAQMD Rule 8-7, gasoline bulk terminals subject to BAAQMD Rules 8-5, 8-18, and 8-33. WSPA therefore suggests that BAAQMD consider exempting any facilities from Reg. 11-18 that are already subject to requirements that reflect TBARCT.

Prioritization. The District's choice of priorities appears arbitrary. For example, the District specifically notes that diesel particulate matter is the largest contributor to risks in the Bay Area, as illustrated in Figure 5. However, diesel engines are not addressed by the rule until the third implementation phase, and reductions from these sources will not be implemented until 2024, at the earliest.

Section 11-18-405. Section 11-18-405 requires that Risk Reduction Plans be updated if "*health risk posed by a facility...would significantly impact health risks to exposed persons.*" It is unclear whether "*significantly impact*" is a subjective term, or whether the District is referring to the "significant risk thresholds" that are 10-20% of the risk action levels in § 11-18-214. The District should revise this language to clarify that the obligation to update the Risk Reduction plan is triggered only if new information (i) causes a facility to exceed the threshold for preparing such a plan for the first time, or (ii) increases the risk associated with the site by more than the significant risk threshold. The District should also consider in its cost-effectiveness calculations the costs to update these plans and implement new emission reduction technologies pursuant to this requirement.

TIMING ISSUES

Draft Rule 11-18 Should Provide Longer Compliance Timeframes

Several of the provisions proposed in Rule 11-18 require compliance with very tight compliance windows that do not appear to be achievable. The Rule 11-18 Staff Report Table 5 also indicates that the compliance plan implementation due dates will depend upon the industry type or prioritization score. WSPA requests the same plan implementation due date for all Bay Area facilities. A large, complex facility needs more time to plan and install control equipment than a facility that operates one diesel engine. Yet the District plans to require some of the most complex facilities to achieve plan implementation by the year 2019 while a facility that may pose the same health risk to a nearby receptor operating a single diesel engine will not reduce health risk until the year 2027.

Section 11-18-401 requires facilities to submit to the District "*any information necessary to complete an HRA of the facility*" within 30 days of a request. This is an overly ambitious time schedule, given the level of effort needed to obtain the latest emissions information, building dimensions, and other similar information. Facilities may also need to conduct source tests or ambient air sampling to provide accurate data to feed into the HRA. WSPA requests that this timeframe be extended to 180 days. At a minimum, this provision should be amended to allow additional time for extensive requests. Additionally, this requirement is unbound, providing no maximum frequency or criteria for the APCO to request information from a facility to conduct an HRA. This can lead to inequitable or unwarranted regulation of a facility.

Section 11-18-402 sets a deadline to submit a draft Risk Reduction Plan within 180 days of notification from the District that a plan is required. This compliance window does not provide facilities with sufficient time to review the accuracy of the District's HRA, or sufficient time to prepare a Risk Reduction Plan meeting the requirements of § 11-18-403. The time needed to evaluate all potential risk reduction measures for a large, complex facility, including the need to re-run HRAs, analyze impacts, and conduct feasibility analyses for engineering requirements, will require considerably more time than 180 days. WSPA is requesting that this timeframe be extended to three years.

Section 11-18-402 requires implementation of a Risk Reduction Plan "*as soon as feasible*, but by no later than three years" from the date the *draft* Plan was submitted for review. The deadline for implementation should be tied to the date the plan is approved by the District, not the date the draft plan was submitted to the District. Given the extremely tight deadlines imposed by the draft Rule, facilities will need to act quickly to design, order, install, and otherwise implement the required control measures. If the District does not give notice that it disagrees with the facility's Risk Reduction Plan or determination of TBARCT until several months after the Plan is submitted, the facility will likely have already made irreversible financial commitments (*e.g.*, ordering new controls) for equipment that the District has rejected. If regulated facilities are to be able to comply with these requirements effectively and in a timely manner, they require certainty of the requirements that will apply and sufficient time to plan, order, and install equipment. Additionally, multiple process unit shutdowns may be needed to install control devices. Indeed, given the scope of the review and planning required (conducting the necessary engineering studies, evaluating various installation scenarios, obtaining permits, getting CEQA approval, procurement, turnaround planning, construction, start-up optimization, and other requirements), WSPA requests that the three-year timeframe be extended to at least five years from when the Plan is approved, and no earlier than the implementation due date of less complex facilities with only diesel engines.

In addition, the baseline requirement of § 11-18-402 is to implement the Risk Reduction Plan "as soon as feasible" but in no event later than three years from the date of the draft Plan's submittal. However, § 11-18-402.2provides the District with the discretion to "shorten the time period proposed by the facility owner/operator for Plan implementation" to less than three years if the District considers that a shorter timeframe is technically feasible or economically practicable or, alternatively, if the facility impacts a CARE designated area. This provision is unnecessary. Facilities will already be under an obligation to prepare Risk Reduction Plans geared to reducing the facility health risk in as short a timetable as possible, which will require an assessment of the technical and economic feasibility of reducing health risk as quickly as possible. The District will have ample opportunity to discuss questions or suggestions District staff may have with respect to the Plan during the review and comment process. The requirement to implement the Risk Reduction Plan "*as soon as feasible*" renders the provision in § 11-18-402.2.1

allowing the District to require implementation of the Plan "*more quickly*" nonsensical. WSPA suggests that § 11-18-402.2 be removed. Again, WSPA is concerned the Section 402.2 language gives the District unilateral authority to reject the plans of facility project teams in the case of a disagreement.

Assuming § 11-18-402.2 is removed, the definition of "Community Air Risk Evaluation (CARE) Designated Area" in § 11-18-208 should also be removed as the term only applies to § 11-18-402.2.2. If the District chooses to reject WSPA's requests, § 11-18-208 should be revised to be more specific. The first sentence of the definition is ambiguous due to the phrases "*other areas*" and "*may*."

California Environmental Quality Act

The California Environmental Quality Act ("CEQA") requires the District to consider the whole of the action; both direct and indirect environmental impacts from the entire project. Public Resources Code, § 21000 et seq. CEQA is further implemented by the CEQA Guidelines, Title 14, California Code of Regulations, § 15000 *et seq*. Rule 11-18 is being considered for review in an EIR that will also review Rule 12-16, which is part of a suite of regulations identified by the District as the Petroleum Refinery Emissions Reduction Strategy. The combined suite of regulations is part of a larger plan to reduce purported refinery emissions in the Bay Area by at least 20% within just a few years.

CEQA prohibits "segmenting" projects to create the appearance of a lesser degree of impact. The District however consistently limits its analyses to individual rules, excluding consideration of the rules it has recently adopted as part of this "strategy" (Rules 6-5, 8-18, 11-10, 12-15 and 9-14) and the future rules that it is currently developing pursuant to this same strategy. In fact, the District's October 14, 2016 Notice of Preparation does not even mention that Rule 12-16 is part of the suite of regulations that make up the Refinery Project. Rule 11-18 is clearly a component of the Petroleum Refinery Emissions Reduction Strategy, notwithstanding that the rule applies to other stationary sources. The Rule's origin is rooted in the District Board's 2014 resolution to reduce emissions from refineries by 20%, and it is being advanced as an alternative suggestion to draft Rule 12-16, which is squarely directed at refineries. Therefore, the impacts of Rule 11-18 on refineries should be analyzed together with the suite of regulations that make up the Petroleum Refinery Emissions Reduction Strategy. Without a true analysis of the whole project, it is impossible to quantify and understand the magnitude of the impact the adopted and proposed changes will have on the regulated industry.

The District cannot piecemeal the analysis of environmental impacts from the Petroleum Refinery Emissions Reduction project that are clearly derived to work toward the common goal of a 20% reduction target. Furthermore, the District must ensure that its analysis and findings are based upon creditable substantive evidence, that a reasonable range of alternatives are considered, that the project decisions meet the purpose and need, significant impacts are avoided or mitigated and that the whole of the actions is identified and analyzed.

ADMINISTRATIVE COMMENT

Section 11-18-402 refers to "risk action levels set forth in Section 11-18-213." The reference should be to Section 11-18-214, not -213. WSPA would ask the District to review this for amendment.

Attachment B
WSPA Comments on Proposed Regulation 12, Rule 16

As the District is aware, WSPA submitted comments on the District's Project Description for Rule 12-16 on September 9, 2016. The draft Rule language now being workshopped does not address the many issues that WSPA raised in our September comment letter. WSPA continues to have significant concerns with the conceptual goal of draft Rule 12-16 and with the practical implementation of the rule's provisions. WSPA hereby incorporates by reference the various comments it has previously made to the District on the conceptual basis of draft Rule 12-16.

While WSPA has a number of specific concerns with the District's analysis (discussed in more below), WSPA strongly supports the concerns voiced in the Staff Report that the proposed rule conflicts with the District's authority under the federal Clean Air Act ("CAA") and the California Health & Safety Code ("H&SC"), will interfere with the State's cap and trade program for GHGs, is not necessary, and will not provide significant real benefits. Staff Report at 17-20, 38-40.

LEGALITY

WSPA's concerns over the legality of emissions caps have already been transmitted to the District separately. WPSA incorporates by reference the comments it submitted in July 2016 and September 2016.[2]

In general, WSPA agrees with District Staff's assessment that draft Rule 12-16 would not withstand judicial scrutiny. As the District acknowledges in the Staff Report, draft Rule 12-16 is inconsistent with existing federal and state air programs, selectively targets petroleum refineries without a showing of necessity, would not be in harmony with the state cap and trade program for greenhouse gas emissions, arbitrarily limits specific refinery emissions to levels that are not necessary to protect local communities, and is beyond the District's statutory authority.

The Staff Report suggests that the District is continuing to develop draft Rule 12-16 with the goal of proposing the rule to the Board for adoption. It is unclear why draft Rule 12-16 is continuing to be developed when District Staff believe that the rule "would likely be found to be beyond the Air District's authority and/or arbitrary and capricious by a Court." Staff Report, at page 3. The structure of the draft rule and its underlying policy objectives are unquestionably unjustified, for the reasons set forth in WSPA's prior comment letters and the District's own Staff Report. Given the significant concerns District staff and the Bay Area refineries have expressed over the legality of the draft rule's provisions, the District should not continue planning to propose Rule 12-16 to the Board for adoption. To the extent that the District must report to the Board on the development of CBE's idea, District staff should simply prepare a report describing the rulemaking, staff's analysis of the draft language that was developed, staff's conclusion that the rule would be illegal if adopted, and an explanation why the draft Rule is not being proposed to the Board.

[2] Marne S. Sussman (Pillsbury Winthrop Shaw Pittman LLP), letter to Honorable Chair Mar, and Members of the Board of Directors, Bay Area Air Quality Management District, "Re: Legal Issues Pertaining to Refinery Emission Cap Option for Proposed Regulation 12-16", July 19, 2016; Kevin Buchan (WSPA), letter to Mr. Gregory Nudd, "Subject: WSPA Comments on BAAQMD's Draft Project Description for Regulation 12, Rule 16 and Regulation 11, Rule 18," September 9, 2016.

GHG Caps are Ineffective and Counterproductive

Greenhouse gas emissions are a global issue, not a local community-based issue. Local greenhouse gas (GHG) caps for refineries in the Bay Area Air Quality District are likely to simply shift GHG emissions elsewhere. This has been recognized by District staff, the District's Advisory Council, the California Air Resources Board (ARB), and the Intergovernmental Panel on Climate Change (IPCC). WSPA summarized comments by District Staff, the District Advisory Council, ARB and the IPCC previously.[3] The October 2016 Staff Report for Rule 12-16 provides additional support that caps may result in increased GHG emissions from shipping imported fuels to California.[4]

Moreover, Bay Area refineries are very energy efficient. ARB published a summary report in mid-2013 showing that the 5 Bay Area refineries subject to ARB's "*Regulation for Energy Efficiency and Co-Benefits Assessment of Large Industrial Facilities*" have implemented hundreds of projects to reduce GHG emissions. The ARB report states that approximately 78% of the estimated 2.8 million metric tonnes per year of GHG reductions associated with these projects have already been achieved.[5] A third party review by San Francisco State University concluded that the refinery project reports demonstrated "*a thorough effort*."[6] The results of ARB's refinery energy efficiency audits strongly suggest that opportunities for significant energy efficiency gains in this sector are limited at best.

To the extent that the District wants to set caps that curtail fuel production at Bay Area refineries, this will simply result in more fuels being produced at other refineries. For refineries outside the state, there is a very real possibility those refineries may be less energy efficient; this would be counterproductive to the District's objective.

Additionally, the application of the localized GHG caps under the jurisdiction of the BAAQMD would result in severely disadvantaging the local refineries relative to refineries located elsewhere in the event new CARB or EPA fuel standards are enacted that would require new process units. EPA and CARB periodically update the motor fuel specifications to ensure that the cleanest fuels possible are available. The application of a facility GHG Cap at historic levels may lead to the shutdown of one or more of the regional refineries because Reg. 12-16 will not allow any increases in GHG emissions regardless of any net environmental benefit. The EIR for this rule should carefully consider this aspect of the rule and estimate the global GHG emission impacts.

Caps Based on Historical Emissions are Technically Problematic

Not only are the proposed emissions caps in §§ 12-16-301 to -305 duplicative of existing federal and state programs targeted at reducing toxic emissions, they are also technically problematic and could potentially require refineries to cut production altogether or risk non-compliance.

As WSPA has previously described, facilities purchase capital equipment today based on what may happen in the future. The District, and every other air permitting jurisdiction in the United States, issues air permits based on the impacts of a facility's *potential* emissions. In California, refineries pay to offset the *potential* emissions at the time the equipment is permitted. For the District to now propose capping emissions based on actual emissions levels from 2010-2014 raises significant Takings concerns and

[3] *See* WSPA Comment Letter, September 9, 2016.
[4] Draft Regulation 12, Rule 16: Petroleum Refining Facility-Wide Emissions Limits AND Draft Regulation 11, Rule 18: Reduction of Risk from Air Toxic Emissions at Existing Facilities, Draft Staff Report, October 2016, p.23.
[5] Energy Efficiency and Co-Benefits Assessment of Large Industrial Sources; Refinery Sector Public Report; California Air Resources Board Stationary Source Division; June 6, 2013: http://www.arb.ca.gov/cc/energyaudits/eeareports/refinery.pdf
[6] Air Resources Board staff presentation, Energy Efficiency and Co-Benefits Assessment Public Reports Workshop, June 30, 2015, slide 30: https://www.arb.ca.gov/cc/energyaudits/meetings/063015/presentation.pdf.

conflicts with these other District regulatory programs (which continue to exist). Further, the proposed emissions caps in §§ 12-16-301 to -305 would be inconsistent with refineries' existing permit limits, which in most cases were specifically designed (and paid for) by the refineries to ensure necessary operational flexibility.

The specific historical emissions baselines chosen are similarly problematic. First, refineries have found that the values in the proposed regulation that are supposedly based in reported emissions do not match the official records of reported emissions. Second, as the District's own Staff Report makes clear, the selected baseline period encompasses a period of artificially low demand, coming out of the last Recession. Staff Report at page 21, Figure 3. As a result, Rule 12-16, as currently drafted, would "lock in" this temporary drop in demand as a permanent, facility-wide cap. At a minimum, the District's economic analysis must evaluate the significant impacts of imposing the cap at such an artificially low level that does not reflect current or anticipated future demand.

The methodology by which this cap is calculated and revised also raises significant concerns. As currently drafted, Rule 12-16 would require ongoing revisions to these caps (each of which would require Board approval) whenever the methods used to calculate emissions changed. Yet the proposed baselines in §§ 12-16-301 to -305 are themselves based on annual emissions calculations from years 2010-2014 that were developed using different emissions calculation methodologies than are being used today. In other words, the current rule is comparing apples and oranges: the District calculated historic actual emissions (the values that the proposed caps are based on) differently than it currently requires actual emissions to be calculated, and differently than it will require the caps be recalculated in the future when the methodologies change once again; yet these changes are never evaluated for consistency against the original methodology that was used to calculate the initial cap. As a result, the caps under which the Refineries will be required to operate will routinely fluctuate based solely on methodology changes, which may not accurately reflect the "real" emissions that the caps purportedly reflect. For most sources, the District's current emissions inventory guidelines (Guidelines) significantly deviate from the methods that the District has used in previous years. The Guidelines require reporting emission sources, including cargo carriers, road dust, and equipment maintenance emissions, which the District has not included in previous emission inventories. The Guidelines specify emission factors that may not have been used in previous emission inventories. Similarly, in the case of California's GHG reporting rule, there have been changes with respect to which sources are reported and how they had to go through a regulatory approval process.

The nature of the Guidelines themselves further exacerbates this concern. The District's current Guidelines are not yet finalized, meaning that WSPA and its members cannot fully and fairly evaluate how the final Guidelines may change the calculation methodologies as compared to the prior reported emissions inventories on which the caps are based. Furthermore, these Guidelines can be changed at any point in the future without a public Board action – and frequently, as the District's own practice has made clear, without involving or informing stakeholders. Thus, the refineries may not have sufficient time to respond or even be informed of changes to the Guidelines that affect compliance with the limits. Board approval of changes to the limits that incorporate changes to the Guidelines may never occur, or may occur at a date too late for refineries to comply with the annual limit.

Similarly, the "*Determination of Compliance Procedure*" in § 12-16-601 refers to an as-yet unwritten part of the District's Manual Of Procedures. If the compliance procedure is not finalized by rule adoption, it may not be possible for the refineries to comply. Sufficient time is needed to implement compliance.

Finally, the January 1, 2018 compliance deadline does not provide enough time for refineries to comply with Rule 12-16. The refinery emissions estimates using the Guidelines may not even be finalized by January 1, 2018 due to the iterative review, corrective action, APCO Action and public inspection process provided in § 12-15-402. Once the emission calculation methods and estimates are finalized, baseline emissions would need to be updated in order to obtain Board approval of changes to the limits. The emission estimation method must be finalized for a refinery to implement a compliance program. The refineries cannot reasonably plan to comply with Rule 12-16 by January 1, 2018, when the actual emissions limits – or, indeed, even the methodology by which those limits will be determined – may well be unknown as of that date.

California Environmental Quality Act

The California Environmental Quality Act ("CEQA") requires the District to consider the whole of a Project; both direct and indirect environmental impacts from the entire project. Public Resources Code § 21000 *et seq*. CEQA is further implemented by the CEQA Guidelines, Title 14, California Code of Regulations, § 15000 et seq. Rule 12-16 is part of a suite of regulations identified by the District as the Petroleum Refinery Emissions Reduction Strategy. The combined suite of regulations is part of a larger plan to reduce purported refinery emissions in the Bay Area by at least 20% within just a few years.

CEQA prohibits "segmenting" projects to create the appearance of a lesser degree of impact. However, the District consistently limits its analyses to individual rules, excluding consideration of rules it has recently adopted as part of the Petroleum Refinery Emissions Reduction Strategy (Rules 6-5, 8-18, 11-10, 12-15 and 9-14) and the future rules that it is currently developing pursuant to this same strategy. In fact, the District's October 14, 2016 Notice of Preparation does not even mention that Rule 12-16 has been part of the suite of regulations that make up the Refinery Project since the initial inception of that Project. Without a comprehensive analysis of the whole project, it is impossible to quantify and understand the magnitude of the impact the adopted and proposed rules will have on the regulated industry.

The District cannot piecemeal the analysis of environmental impacts from the Petroleum Refinery Emissions Reduction Project that are clearly derived to work toward the common goal of a 20% reduction target. Furthermore, the District must ensure that its analysis and findings are based upon creditable substantive evidence, that a reasonable range of alternatives are considered, that the project decisions meet the purpose and need, significant impacts are avoided or mitigated and that the whole of the actions is identified and analyzed.

APPENDIX B

AIR EMISSION CALCULATONS AND HEALTH RISK ASSESSMENT

ICE Replacement - Emission Factors

Off- Road Equipment Type	Numaber	Daily Hours of Use	ROG lbs/hr	CO lbs/hr	NOx lbs/hr	SOx lbs/hr	PM lbs/hr	CO2 eq MT/hr
Forklift	1	2	0.02	0.22	0.19	0	0.01	0.01
Generator	1	4	0.05	0.28	0.41	0	0.22	0.02
Welder	1	4	0.04	0.19	0.21	0	0.02	0.01

ICE Replacement lbs/day = number *hrs/day*emission factor

Off- Road Equipment Type	ROG lbs/day	CO lbs/day	NOx lbs/day	SOx lbs/day	PM10 lbs/day	PM2.5 lbs/day	CO2 eq MT/d
Forklift	0.04	0.44	0.38	0	0.02	0.02	0.02
Generator	0.2	1.12	1.64	0	0.88	0.88	0.08
Welder	0.16	0.76	0.84	0	0.08	0.08	0.04
Sub-total off-road lbs/day	0.4	2.32	2.86	0	0.98	0.98	0.14

On-Road Equipment Type	ROG lbs/day	CO lbs/day	NOx lbs/day	SOx lbs/day	PM10 lbs/day	PM2.5 lbs/day	CO2 eq MM t/d
Construction Worker Light-duty Auto #/day	0.18	0.27	0.02	0.00	0.01	0.00	0.03
Heavy-heavy-duty Truck #/day	0.30	2.15	1.88	0.00	0.03	0.02	0.20
Sub-totalotal #/day	0.48	2.41	1.91	0.01	0.04	0.02	0.23

LD Autos	Avg. Trip Length
# Vehicle Trips	One way
10	11
HHD Truck	HHD Truck Trips/day
2	50

	ROG lbs/day	CO lbs/day	NOx lbs/day	SOx lbs/day	PM10 lbs/day	PM2.5 lbs/day	CO2 eq MM t/d
Sub-total Off-road Construction Equip	0.4	2.32	2.86	0	0.98	0.98	0.14
Sub-total On-road (Worker + HHD Truck)	0.48	2.41	1.91	0.01	0.04	0.02	0.23
Total	0.88	4.73	4.77	0.005	1.02	1.00	0.37

ICE Retrofit - Emission Factors

DPFs - DOCs

Off- Road Equipment Type	Numaber	Daily Hours of Use	ROG lbs/hr	CO lbs/hr	NOx lbs/hr	SOx lbs/hr	PM lbs/hr	CO2 eq MT/hr
Forklift	1	4	0.02	0.22	0.19	0	0.01	0.01

ICE Retrofit lbs/day = number *hrs/day*emission factor

Off- Road Equipment Type	ROG lbs/day	CO lbs/day	NOx lbs/day	SOx lbs/day	PM10 lbs/day	PM2.5 lbs/day	CO2 eq MM t/d
Subtotal Forklift #/day	0.08	0.88	0.76	0	0.04	0.04	1.8141E-05

On-Road Equipment Type	ROG lbs/day	CO lbs/day	NOx lbs/day	SOx lbs/day	PM10 lbs/day	PM2.5 lbs/day	CO2 eq MM t/d
Construction Worker Light-duty Auto #/day	0.14	0.21	0.02	0.00	0.01	0.00	0.02732308
Heavy-heavy-duty Truck	0.05	0.18	1.28	0.00	0.03	0.02	0.19746489
Sub-totalotal On-road	0.19	0.40	1.30	0.00	0.04	0.02	0.22

Total 1 unit Off-road and On-road #/day	0.27	1.28	2.06	0.00	0.08	0.06	0.22
5 units per day	1.37	6.39	10.29	0.01	0.40	0.29	1.12
10 units per day	2.74	12.78	20.58	0.02	0.80	0.57	2.25
15 units per day	4.11	19.17	30.86	0.03	1.20	0.86	3.37

LD Autos	Avg. Trip Length
# Vehicle Trips	One way
8	11
HH duty truck trips/day	Avg. Trip Length
2	50

FCCU with WGS GHG Parameters

Off- Road Equipment Type	Amount	Daily Hours of Use	CO2 eq MT/hr	CO2 eq MT/day	Construction/ period MT	Days/ Period	
Demolition						20.00	
Crane (140 ton, composite hp)	1	10	0.04	0.4	8		
Front End Loader	1	10	0.02	0.2	4		
Forklift	2	10	0.01	0.2	4		
Demolition Hammer	1	10	0.001	0.01	20.01		
Construction						160	2 construction periods
Air Compressor	1	10	0.02	0.2	48		
Crane (140 ton, composite hp)	2	10	0.04	0.8	192		
Aerial Lift (Man Lift)	3	10	0.01	0.3	72		
Generator	1	10	0.02	0.2	48		
Welder	3	10	0.01	0.3	72		

Total 1 cons. + demo	468.01
Total 3 cons. + demo	1404.03
Total 5 cons. + demo	2340.05

FCCU SCR - Parameters

Off- Road Equipment Type	Amount	Daily Hours of Use	ROG lbs/hr	CO lbs/hr	NOx lbs/hr	SOx lbs/hr	PM lbs/hr	CO2 eq MT/hr
Aerial Lift (Man Lift)	1	2	0.00	0.17	0.1	0.00	0.00	0.01
Air Compressor	1	1	0.06	0.32	0.43	0.00	0.03	0.02
Backhoe	1	4	0.03	0.36	0.31	0.00	0.02	0.02
Concrete Pump	1	2	0.07	0.4	0.43	0.00	0.03	0.003
Concrete Saw	1	2	0.06	0.41	0.80	0.00	0.04	0.02
Crane (140 ton, composite hp)	2	10	0.06	0.41	0.80	0.00	0.04	0.04
Crane - Rough Terrane (28 ton, 120 hp)	0	0	0.07	0.4	0.42	0.00	0.02	0.02
Forklift	1	3	0.02	0.22	0.19	0.00	0.01	0.01
Generator	2	8	0.05	0.28	0.41	0.00	0.22	0.02
Plate Compactor	1	4	0.01	0.03	0.03	0.00	0.00	0.001
Welder	2	8	0.04	0.19	0.21	0.00	0.02	0.01

FCCU with SCR lbs/day = number *hrs/day*emission factor

Off- Road Equipment Type	ROG lbs/day	CO lbs/day	NOx lbs/day	SOx lbs/day	PM10 lbs/day	PM2.5 lbs/day	CO2 eq MT/d
Aerial Lift (Man Lift)	0.00	0.34	0.20	0.00	0.00	0.00	0.02
Air Compressor	0.06	0.32	0.43	0.00	0.03	0.0276	0.02
Backhoe	0.12	1.44	1.24	0.00	0.08	0.0736	0.08
Concrete Pump	0.02	0.8	0.86	0.00	0.06	0.0552	0.006
Concrete Saw	0.12	0.82	1.6	0.00	0.08	0.0736	0.04
Crane (140 ton, composite hp)	0	0	0	0.00	0	0	0.8
Forklift	0.06	0.66	0.57	0.00	0.03	0.0276	0.03
Generator	0.8	4.48	6.56	0.00	3.52	3.2384	0.32
Plate Compactor	0.04	0.12	0.12	0.00	0.00	0.00	0.004
Welder	0.64	3.04	3.36	0	0.32	0.2944	0.16
Subtotal lbs/day off-road	1.86	12.02	14.94	0.00	4.12	3.79	1.48
						Total	1.5

FCCU with SCR lbs/day and Tons/period

	ROG	CO	Nox	SOx	PM10	PM2.5 lbs/day	CO2eq MT
Subtotal Construction Worker Vehicle Emissions Trips #/day	4.96	7.46	0.69	0.69	0.32	0.13	0.96
Subtotal Const. worker Vehicle Trips tons/period	0.48	0.73	0.07	0.067	0.03	0.03	186.48
Heavy-heavy-duty Truck #/day	0.26	1.12	7.91	0.020	0.16	0.09	0.99
Heavy-heavy-duty Truck tons/period	0.03	0.11	0.77	0.002	0.02	0.01	192.53
Auto +HHD Truck lb/day	5.22	8.58	8.60	0.71	0.47	0.22	1.94
Subtotal Off-road #/day	1.86	12.02	14.94	0.711	4.12	3.79	1.50
Total #/day	7.08	20.60	23.54	1.42	4.59	4.01	3.44
Auto +HHD Truck tons/period	0.51	2.01	2.29	0.07	0.45	0.39	379.01
Subtotal Off-road tons/period	0.18	1.17	1.46	0	0.40	0.37	195.00
Total #/ period	7.08	20.60	23.54	1.42	4.59	4.01	
Total 1 SCR Tons per Constructionn period	0.69	3.18	3.75	0.07	0.85	0.76	574.01
Total 3 SCRs Tons per Construction period	2.07	9.54	11.25	0.21	2.55	2.28	1722.02

		Avg. Trip Length
Control equipment	# Auto Trips	One-way Trip
SCR FCCU	280	11
HHD trip length	HHD Truck trips/day	
50	10	

# of days =	130	total days 260

Ton/construction period = Total pounds/day*(Total days/construction period * 0.5) + (Total pounds/day * 0.5) * (Total days/construction period * 0.5)

Carbon Adsorber Parameters

Off- Road Equipment Type	Number	Daily Hours of Use	ROG lbs/hr	CO lbs/hr	NOx lbs/hr	SOx lbs/hr	PM lbs/hr	CO2 eq MT/hr
Backhoe	1	4	0.07	0.4	0.42	0	0.02	0.02
Crane - Rough Terrane (28 ton, 120 hp)	1	8	0.04	0.19	0.21	0	0.02	0.02
Welder	2	8	0.06	0.06	0.32	0.43	0	0.01
Air Compressor	1	4	0.03	0.36	0.31	0	0.02	0.02
Plate Compactor	1	4	0.01	0.03	0.03	0	0	0.001
Forklift	1	3	0.02	0.22	0.19	0	0.01	0.01
Concrete Pump	1	2	0.01	0.04	0.05	0	0	0.003
Concrete Saw	1	2	0.07	0.4	0.43	0	0.03	0.02
Generator	1	8	0.05	0.28	0.41	0	0.22	0.02
Aerial Man Lift	1	2	0	0.17	0.1	0	0	0.01

Carbon Adsorber lbs/day = number *hrs/day*emission factor

Off- Road Equipment Type	ROG lbs/day	CO lbs/day	NOx lbs/day	SOx lbs/day	PM10 lbs/day	PM2.5 lbs/day	CO2 eq MT/d
Backhoe	0.28	1.6	1.68	0	0.08	0.074	0.08
Crane - Rough Terrane (28 ton, 120 hp)	0.32	1.52	1.68	0	0.16	0.15	0.16
Welder	0.96	0.96	5.12	0	0	0.00	0.16
Air Compressor	0.12	1.44	1.24	0	0.08	0.07	0.08
Plate Compactor	0.04	0.12	0.12	0	0	0.00	0.004
Forklift	0.06	0.66	0.57	0	0.00	0.00	0.03
Concrete Pump	0.02	0.08	0.1	0	0.00	0.00	0.006
Concrete Saw	0.14	0.8	0.86	0	0.06	0.06	0.04
Generator	0.4	2.24	3.28	0	1.76	1.62	0.16
Aerial Man Lift	0	0.34	0.2	0	0	0.00	0.02
Subtotal lbs/day off-road	2.34	9.76	14.85	0	2.14	1.97	0.74

	ROG lbs/day	CO lbs/day	NOx lbs/day	SOx lbs/day	PM10 lbs/day	PM2.5 lbs/day	CO2 eq MT
Construction worker vehicle emissions #/day	0.71	1.07	0.10	0.00	0.05	0.02	0.137
Heavy-heavy-duty Truck #/day	0.22	0.02	1.58	0.00	0.03	0.02	0.644
Subtotal Auto + HHD Truck #/day	0.93	1.08	1.68	0.01	0.08	0.04	0.781
Subtotal off-road #/day	2.34	9.76	14.85	0.00	2.14	1.97	0.740
Total #/day	3.27	10.84	16.53	0.01	2.22	2.01	1.521
Auto & HHD Truck tons/period	0.05	0.05	0.08	0.000	0.004	0.002	76.148
Off-road tons/period	0.11	0.48	0.72	0.00	0.10	0.10	72.150
Total 1 Unit tons/ period	0.16	0.53	0.81	0.00	0.11	0.10	148.3
Total 5 Units tons/period	0.80	2.64	4.03	0.00	0.54	0.49	741.5

	# Vehicle Trips/day	Avg. Trip Length One-way Trip
Worker trips	40	11
HHD truck trips/day	2	50

1/2 # of days =	65	Total 130

On-road Mobile Source Emission Factors

Light-duty Auto	CO	ROG	Nox	SOx	PM10	PM2.5	CO2	
Break-wear g/mile = (a)					0.036750011	0.015750005		
Tire wear g/mile = (b)					0.008000002	0.002000001		
Running Evaporation g/mile = (c)		0.32685						
Running Exhaust g/mile = (d)	0.88207051	0.0206274	0.08658368	0.00305211	0.00173145	0.001593313	304.297585	exhaust
Start-up g/trip = (e)	2.386995467	4.215288	0.16371717	0.00072322	0.002529158	0.002328798	68.1117653	startup

Equation: (No. of One-way Vehicles Trips*One-way Trip Length*[(a) PM10/PM2.5 only]*[(b) PM10/PM2.5 only]*[(c) ROG only])/(lb/454gm))+((Number of One-way Vehicle trips*(e))/(lb/454gm)

Star-up includes startu-up exhaust + hotsoak+running loss+((restng loss+diurnal)/2)

Heavy-Heavy-Duty Truck Mobile Source Emission Factors

Heavy-Heavy-Duty Truck (diesel)	CO	ROG	Nox	SOx	PM10	PM2.5	CO2
Break-wear g/mile = (g)					0.061	0.026	
Tire wear g/mile = (h)					0.035	0.009	
Running Exhaust g/mile (i)	0.839	0.192	5.802	0.016	0.043	0.041	1739.42788
Idling Exhaust g/vehicle/day = (j)	8.907	2.327	68.888	0.110	0.140	0.134	11761.0534

Equation: (No. of One-way Vehicles Trips*One-way Trip Length*[(g) PM10/PM2.5 only]*[(h) PM10/PM2.5 only])/(lb/454gm))+((Number of One-way Vehicle trips*(j))/(lb/454gm)

Reference: CARB, EMFAC 2014 for the Bay Area

NaOH HRA

	Daily Usage Tons/Day	Annual Usage Tons/year	Usage Rate gal/hr	Density #/gal	#/hr
NaOH (50% solution)	3.37	1228.30	22.00	12.747	280.43

NaOH Demand Filling Loss (lb/day)	Q = Fill Rate = NaOH Demand (MMgal/day)	S = Saturation Factor	P = Vapor Pressure of material Loaded (psia)	M = NaOH vapor molecular weight (lb/lbmole)	T= temperature of liquid loaded (oR)	Daily PM10 Filling Loss (lb/day)	Eworking = Hourly PM10 Working Loss (lb/hr)	Total Hourly PM10 Loss (lb/hr)	Total Hourly PM10 Loss (lb/hr) at 25m
3.37	0.53	1.45	0.042	24.8	544.67	1.82E-02	7.60E-04	2.28E-03	2.28E-05

NaOH @ 50% solution density = 12.747 lb/gal
Mv for NaOH solution = 24.8 lb/lbmol
Vapor Pressure for NaOH = 2.18 mmHg at 29.4oC or 85oF = 0.042 psia
Loading Temperature = 85^{o}F to 100^{o}F (544.67^{o}R to 559.67^{o}R)
Breathing Loss = 3 * Filling Loss

Filling Loss

$E_{loading}$ lb/day = (12.46) ((S)(P)(M)(Q))/T where

S = saturation factor (dimensionless; obtained from Table 5.2-1 in AP-42)
= 1.45 (Splash loading: dedicated normal service)
P = vapor pressure of the material loaded at temperature T (psia)
M = vapor molecular weight (lb/lb-mole)
Q = volume of material loaded (1,000 gal/day)
T = temperature of liquid loaded (^{o}R).

Caustic/NaOH & Ammonia Delivery Truck Trips

Caustic/NaOH	VOC lbs/day	CO lbs/day	NOx lbs/day	SOx lbs/day	PM10 lbs/day	PM2.5 lbs/day	CO2 MT/day
Subtotal 1 HHD/day #/day	0.06	0.26	1.84	0.02	0.31	0.02	0.23
Total 10 HHD Truck/day #/day	0.61	2.61	18.37	0.19	3.08	0.21	2.32
Subtotal 1 Facility Tons/year	0.032	0.14	0.96	0.00	0.160	0.011	24.15
Total 5 Facilities Tons/year	0.16	0.68	4.78	0.005	0.802	0.054	120.772
Ammonia							
Subtotal 1 HHD/day #/day	0.05	0.22	1.58	0.004	0.031	0.017	0.20
Total 6 HHD Truck/day #/day	0.32	1.34	9.49	0.024	0.187	0.104	1.18
Subtotal 1 Facility Tons/year	0.00	0.01	0.06	0.00	0.00	0.00	15.80
Total 3 Facilities Tons/year	0.01	0.03	0.19	0.00	0.00	0.00	47.39

	# One- Trips/day	Avg. Trip Length One way	
	HHD Truck	HHD Truck	Trips per Year
Caustic	10	60	104
Ammonia	6	50	80
1 Caustic	2		
1 NH3	2		

Heavy-Heavy-Duty Truck Mobile Source Emission Factors

Heavy-Heavy-Duty Truck (diesel)	CO	ROG	Nox	SOx	PM10	PM2.5	CO2
Break-wear g/mile = (g)					0.061	0.026	
Tire wear g/mile = (h)					0.035	0.009	
Running Exhaust g/mile (i)	0.839	0.192	5.802	0.016	0.043	0.041	1739.427878
Idling Exhaust g/vehicle/day = (j)	8.907	2.327	68.888	0.110	0.140	0.134	11761.05342

Equation: (No. of One-way Vehicles Trips*One-way Trip Length*[(g) PM10/PM2.5 only]*[(h) PM10/PM2.5 only])/(lb/454gm))+((Number of One-way Vehicle trips*(j))/(lb/454gm)
Reference: CARB, EMFAC 2014 for the Bay Area

Operational GHG Emissions from Regerating Spent Carbon

Fuel type	Natural Gas Usage scfmm/day	CH4 lb/mmscf	N2O lb/mmscf	CO2 lb/mmscf	Regeneration D/yr
Natural Gas	0.062	2.3	0.64	120000	365

Natural Gas Usage mmscf/yr	22.63	CH4 MT/yr	NO2 MT/yr	CO2 MT/year	CO2e MT/year
1 Unit		0.02	0.01	1231.56	1234.32
5 Units		0.12	0.03	6157.82	6171.62

	GWP factors
CO2 =	1
CH4 =	34
N2O =	298