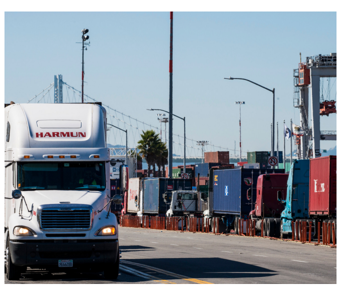
DRAFT ENVIRONMENTAL IMPACT REPORT

OWNING OUR AIR

THE WEST OAKLAND COMMUNITY ACTION PLAN

State Clearinghouse No. 2019059062
July 2019



Bay Area Air Quality Management District

West Oakland Environmental Indicators Project
Know which way the wind blows

A joint plan by Bay Area Air Quality Management District and West Oakland Environmental Indicators Project

Draft Environmental Impact Report for the

AB 617 Owning Our Air: The West Oakland Community Action Plan

Prepared for:

Bay Area Air Quality Management District
375 Beale St., Suite 600
San Francisco, CA 94109
Contact: Ada Márquez
(415) 749-8673

Prepared By:

Environmental Audit, Inc.
1000-A Ortega Way
Placentia, CA 92870
Contact: Debra Bright Stevens
(714) 632-8521

July 2019

This page intentionally left blank.

PREFACE

Table of Contents

Draft Environmental Impact Report for the AB 617 Community Action Plan

Page No.

Page No.

CHAPTER 3 – ENVIRONMENTAL SETTING, IMPACTS, MITIGATION MEASURES AND CUMULATIVE IMPACTS

Page No.

Page No.

Page No.

CHAPTER 1

INTRODUCTION AND EXECUTIVE SUMMARY

1.0 INTRODUCTION AND EXECUTIVE SUMMARY

1.1 INTRODUCTION

The Bay Area Air Quality Management District (District), in accordance with Assembly Bill 617, (AB 617) is proposing to implement the West Oakland Community Action Plan. AB 617 requires the adoption and implementation of community emissions reduction plans for targeted jurisdictions with disproportionate impacts from air pollution. Pursuant to AB 617, the Bay Area Air Quality Management District (Air District) and the West Oakland Environmental Indicators Project jointly developed a community emissions reduction plan, referred to as the Community Action Plan, for West Oakland. The proposed plan includes strategies at the community level to maximize emission reductions and reduce residents' cumulative exposure to criteria air pollutants, diesel particulate matter (Diesel PM), fine particulate matter ($PM_{2.5}$), and toxic air contaminants (TAC). The West Oakland Community Action Plan is an integrated community air quality plan to reduce the community's burden from air pollution and eliminate health risk disparities in West Oakland. The Community Action Plan documents the Steering Committee's effort to study air pollution in West Oakland, and to identify and to prioritize Action Strategies that once implemented, will work towards eliminating West Oakland's air pollution burden.

The government agencies with primary responsibility for implementing the strategies in the Community Action Plan include the Air District, California Air Resources Board (CARB), City of Oakland, Port of Oakland, Alameda County Public Health Department, California Department of Transportation (Caltrans), Alameda County Transit Commission (ACTC), and Metropolitan Transportation Commission.

1.2 CALIFORNIA ENVIRONMENTAL QUALITY ACT

The California Environmental Quality Act (CEQA), Public Resources Code Section 21000 et seq., requires that the potential adverse environmental impacts of proposed projects be evaluated and that feasible methods to reduce or avoid significant adverse environmental impacts of these projects be identified. The AB 617 West Oakland Community Action Plan is an integrated community air quality plan to reduce the community's air pollutant burden and eliminate health risk disparities in West Oakland.

Pursuant to CEQA, this Environmental Impact Report (EIR) has been prepared to address the potential adverse impacts associated with implementation of the proposed Community Action Plan. Prior to making a decision on the Community Action Plan, the Air District Board of Directors must review and certify the EIR as providing adequate information on the potential adverse environmental impacts of implementing the proposed Community Action Plan.

1.2.1 NOTICE OF PREPARATION/INITIAL STUDY

A Notice of Preparation for the West Oakland Community Action Plan (included as Appendix A of this EIR) was distributed to responsible agencies and interested parties for a 30-day review from May 14, 2019 to June 14, 2019. 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. Five comment letters were submitted on the NOP 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, energy, greenhouse gases, hazards and hazardous materials, utilities and service systems. The following environmental resources were considered to be less than significant in the Notice of Preparation and Initial Study: aesthetics, agriculture and forestry resources, biological resources, cultural resources, geology/soils, hydrology and water quality, land use/planning, mineral resources, noise, population/housing, public services, recreation, transportation/traffic, tribal cultural resources, and wildfires (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 the West Oakland Community Action Plan as identified in the Notice of Preparation 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). West Oakland Community Action Plan would apply to sources within and adjacent to the community of West Oakland.

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 when considering land use and planning decisions related to projects that implement a Strategy in the West Oakland Community Action Plan, pursuant to CEQA Guidelines §15152. Strategies that would be implemented by other agencies may also require CEQA review. CARB is required to review and approve the Plan. There is no other State, federal or local permits required to adopt the Community Action Plan. However, implementation of some of the Strategies will require various permits from all levels of government.

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, five comment letters were received on the Notice of Preparation and Initial Study. Issues and concerns raised in the comment letters included: (1) comments that the Plan must include new actions that go beyond existing efforts to reduce air pollutant disparities; (2) the EIR should clearly state that the EIR is for the Strategies under the Air District's authority; (3) more detailed information is needed to better understand some of the Strategies; and (4) concerns regarding impacts to wastewater utilities. Copies of the comment letters are provided in Appendix A.

1.3 EXECUTIVE SUMMARY: CHAPTER 2 – PROJECT DESCRIPTION

The West Oakland Community Action Plan is a joint effort between the West Oakland Environmental Indicators Project (Indicators Project) and the Air District, with direction from the West Oakland Community Action Plan Steering Committee. The Steering Committee also will work with various public agencies to implement the Plan Strategies. The City and the Port will be key partners. This work will include more investigation into the Strategies to understand authority, legality, effectiveness, and feasibility. The other agencies with the largest roles in implementation of the Plan include CARB, the City of Oakland, Alameda County Public Health Department, Alameda County Transportation Commission, Metropolitan Transportation Commission, and the California Department of Transportation. Commitment from and cooperation with these agencies is central to the success of the Plan.

The West Oakland Community Action Plan includes 84 Strategies aimed at reducing emissions and exposure to emissions from air pollution sources within and adjacent to West Oakland air pollution sources. The Strategies in the Plan are summarized below.

Stationary Source Strategies: Strategies to control stationary sources include considering: (1) replacing stationary diesel engines with Tier 4 diesel or cleaner engines; (2) reformulation of vanishing oils and rust inhibitors; (3) reducing toxic air contaminant emissions from existing industrial sources including Schnitzer Steel and the East Bay Municipal Utility District's Wastewater Treatment Plant; (4) potential new or amended regulations to further reduce emissions from metal recycling and foundry operations; (5) developing a regulation to reduce emissions of reactive organic gases and other toxic compounds from organic liquid storage tanks; and (6) identifying incentives to reduce emissions from waste water treatment plants and anaerobic digestion facilities.

Mobile Source Strategies: The Plan includes strategies to reduce emissions from mobile sources including vehicles, trucks, locomotives, and ships. A number of strategies would encourage the early retirement of old vehicles, and the use of zero-emissions trucks, buses, and vehicles. Strategies to control emissions from locomotives and ships include: (1) increasing the use of shore-power or other emission control systems by vessels at berth in the Port of Oakland; (2) encouraging use of Tier 3 and 4 compliant diesel engines on tugs and barges; and (3) encouraging use of Tier 4 compliant engines on locomotives. A number of strategies would increase enforcement on a variety of different activities including illegal parking, excess idling, and not using appropriate truck routes.

Other Mobile Source Strategies: The Plan encourages other strategies to reduce emissions from mobile sources including: (1) encouraging car sharing for low-income individuals; (2) providing pedestrian and bicycle improvements to increase use of public transit, e.g., BART; (3) increasing street sweeping to minimize the re-entrainment into the air of particulates that collect on streets and freeways; (4) developing safe routes to school to minimize conflicts between pedestrians and trucks/vehicles; and (5) considering improvements to public transit along Grand Avenue.

Land Use Strategies: Land use strategies are aimed at modifying land uses to limit exposure to emissions. Under this category, the Plan includes strategies to reduce exposure to emissions by: (1) relocating sources away from sensitive receptors; (2) accelerating the relocation of auto and truck-related businesses that are non-conforming land uses; (3) developing regulations to prohibit certain freight businesses and truck yards in portions of West Oakland; (4) increasing urban tree planting and vegetative biofilters; (5) adopting development impact fees to fund various environmental mitigations; (6) installing solid barriers between buildings and air pollution sources (e.g., freeways) to reduce exposure to air pollution; (7) increasing electrical infrastructure to encourage zero emissions vehicles/trucks; and (8) improving and updating the complaint processes, enforcement procedures and coordination with other public agencies to better respond to odors and open burning complaints.

Health Program Strategies: Health Program strategies are aimed at generally reducing exposure to air pollution. These strategies could include: (1) the installation of high efficiency air filtration systems on buildings to reduce exposure; (2) relocating exhaust stacks to reduce local exposure to air pollutants; (3) providing additional air monitoring to better detect sources of air pollution; and (4) better reporting of health data to identify public health impacts.

Implementation of the Community Action Plan, once approved, will be the responsibility of the Air District and the Indicators Project with support and coordination of a number of governmental agencies including the City of Oakland, CARB, Port of Oakland, and the Alameda County Public Health Department.

The Steering Committee with the District developed targets to improve air quality and address exposure disparities. The Plan targets will assist the Steering Committee in determining whether it is on track to meet the Plan's goal. Simultaneously, the Plan will reduce disproportionate air quality impacts between West Oakland and the Bay Area. The Plan has a five-year proposed implementation schedule from 2020 to 2024. The targets can be described as follows:

- **By 2025**, throughout West Oakland, all neighborhoods will experience conditions of the ***average*** West Oakland residential neighborhood, as they existed during the base year (2017).
- **By 2030,** throughout West Oakland, all neighborhoods will experience conditions of the **least** impacted residential neighborhood during the base year (2017), i.e., the "cleanest" neighborhood in West Oakland.

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 the West Oakland Community Action Plan, 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) Energy; (3) Greenhouse Gases; (4) Hazards and Hazardous Materials; and (5) Utilities and Service systems. Included for each impact category is a discussion of the environmental setting, significance criteria, whether the 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 West Oakland Community Action Plan also includes Strategies proposed to be implemented primarily or exclusively by other agencies, such as the City of Oakland and CARB. The West Oakland Community Action Plan includes these control measures because they involve activities by other agencies in the region that further the same clean air goals for West Oakland that the Air District, and other agencies and organizations, are seeking to achieve under the Plan. Including them in the Plan serves to provide a comprehensive picture of all such activities throughout the region. These activities by other agencies are not dependent on approval of the Strategies that are under the authority of the Air District. Further, the Air District's approval of the Strategies will not authorize or commit those agencies to any action. As these actions and activities by independent agencies are not Air District actions and will occur independently of the District's approval of the Strategies under their authority, they are not direct or indirect effects resulting from approval of the Plan that must be analyzed in this document. Accordingly, the EIR does not address implementation actions by other agencies that are independent of the Air District's implementation actions under the Community Action Plan.

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 (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 (PM_{10} and $PM_{2.5}$), 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, secondary annual $PM_{2.5}$ specifically for visibility, hydrogen sulfide, and vinyl chloride.

Air quality conditions in the San Francisco Bay Area have improved since the Air District was created in 1955. 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 PM_{10} standard, annual PM_{10} standard, and annual $PM_{2.5}$ standard. The Air District is unclassifiable/attainment for the federal CO, NO_2, SO_2, lead, and PM_{10} 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 federal AAQS.

In 2017, no monitoring stations measured an exceedance of any of State or federal AAQS for CO and SO_2. There was one exceedance of the federal NO_2 AAQS at one monitoring station in 2017, although the area did not violate the federal AAQS. All monitoring stations were in compliance with the federal PM_{10} standards. The State 24-hour PM_{10} standard was exceeded on six days in 2017, at the San Jose monitoring station.

The Bay Area is designated as a non-attainment area for the federal and state 8-hour ozone standard and the federal 24-hour $PM_{2.5}$ standard. The state and federal 8-hour ozone standards were exceeded on 6 days in 2017 at one site or more in the Air District; most frequently in the Eastern District (Livermore, Patterson Pass, and San Ramon) and the Santa Clara Valley. The federal 24-hour $PM_{2.5}$ standard was exceeded at one or more Bay Area station on 18 days in 2017, most frequently in the Napa, San Rafael, Vallejo, and San Pablo.

1.4.1.2 Air Quality Impacts

Construction activities may be associated with some Strategies that the Air District would implement. The Strategies which may result in construction activities include Strategy #63 (potential construction of enclosures). Construction activities may also be associated with other Strategies that the Air District would implement (Strategy #61, implementation of a bonnet system for ships and Strategy #70 the installation of high efficiency air filtration systems) but the details of those construction activities are unknown and, therefore, speculative or expected to be very minor.

Based on the construction emissions, it is concluded that construction emissions associated with the Strategies that the Air District expects to implement under the West Oakland Plan would be below the Air District significance thresholds for criteria pollutants and would, therefore, be less than significant. Construction emissions are temporary as construction emissions would cease following completion of construction activities. Any future projects proposed to implement these strategies by other government agencies, would require further environmental analyses per CEQA.

The implementation of the Strategies by the Air District would result in a minor increase in emissions associated with the potential delivery of materials to supply air emission control systems that would be implemented as part of the Plan. The potential emission increases are expected to be offset with emission decreases that would occur due to implementation of the Plan (see Table 3.2-18). Based on the evaluation of the Strategies that the Air District would implement as part of the West Oakland Community Action Plan, the emission reductions associated with the Plan are expected to exceed the potential air quality increases and there would be no net emission increases. Therefore, air quality impacts would be less than significant.

Implementation of the Strategies in the West Oakland Community Action Plan by the Air District is not expected to generate significant adverse project-specific air quality impacts and is not expected to exceed the applicable significance thresholds (result in an increase in emissions). These thresholds represent the levels at which a project’s individual emissions would result in a cumulatively considerable contribution to the Air District’s existing air quality conditions for individual projects. As a result, air quality impacts from the proposed project are not considered to be cumulatively considerable pursuant to CEQA Guidelines §15064 (h)(1). Emission reductions from the Air District’s 2017 Clean Air Plan, in conjunction with the Strategies in the West Oakland Community Plan, are expected to far outweigh any potential secondary emission increases associated with implementation of the Strategies in the West Oakland Community Action Plan, providing a beneficial impact on air quality and public health.

1.4.2 ENERGY

1.4.2.1 Energy Setting

Power plants in California provided approximately 70.65 percent of the total in-state electricity demand in 2017, of which 29.65 percent came from renewable sources such as biomass, solar, and wind power. The Pacific Northwest provided another 13.65 percent of total electricity demand and the remaining 15.69 percent was imported from the Southwest. The total electricity used in California in 2017 was 292,039 gigawatts (GWh)[1].

The contribution between in-state and out-of-state power plants depends upon, among other factors, the precipitation that occurred in the previous year and the corresponding amount of hydroelectric power that is available. The installed capacity of the 1,520 in-state power plants [greater than 0.1 megawatts (MW)[2]] totaled 88,003 MW. The Pittsburg Generating Station, located in Contra Costa County, is currently the only facility located within Air District jurisdiction that ranks within the top ten power generating facilities in California. Smaller power plants and cogeneration facilities are located throughout the Bay Area. Pacific Gas and Electric (PG&E) is the primary supplier of electricity to northern California, including the Bay Area.

Local electricity distribution service is provided to customers within the Air District by privately-owned utilities such as PG&E. Many public-owned utilities, such as Alameda Power and Telecom, East Bay Municipal Utility District, Silicon Valley Power, and the Santa Clara Electric Department also provide service. PG&E is the largest electricity utility in the Bay Area, with a service area that covers all, or nearly all, of Alameda, Contra Costa, Marin, Napa, San Francisco, San Mateo, Santa Clara, Solano, and Sonoma counties. PG&E provides over 90 percent of the total electricity demand in the Air District. Alameda County consumed 11,113 million kilowatt hours of electricity in 2017.

1.4.2.2 Energy Impacts

Increasing penetration of zero and near-zero vehicles and electrifying sources of emissions (e.g., ships at berth) could increase future demand for electricity in the Bay Area and other areas of California that provide electricity to the Bay Area. Estimates of the potential increase in electricity use are provided where sufficient information is available to estimate the number of pieces of equipment or vehicles that would be required under each of the Strategies. In most cases, that information is not available and cannot be determined at this time. The potential increased demand for electricity to implement Strategies in the Plan that would electrify on-road and off-road mobile sources is expected to be less than one gigawatt-hour (GWh) in the year 2021 and one GWh by 2023.

PG&E has forecasted the potential load impacts on electricity demand that would be expected to occur from increased charging of electric vehicles in the future. PG&E has estimated that meeting the state’s goal of five million electric vehicles (or two million within PG&E’s service territory) by 2030 would increase the current electrical demand for electric vehicles of approximately 160 GWh in 2018 to 5,982 GWh in 2030 (see Table 3.3-4). PG&E plans to add resources to supply sufficient electricity to its customers for electric vehicles as well as from population growth. Most of the increases will come for addition bioenergy, solar, and wind resources due to the Renewable Portfolio Standard requirements.

[1] A gigawatt equals one billion (10^9) watts of electricity.
[2]A megawatt equals one million watts.

While the electricity use associated with electric vehicles is expected to increase, PG&E predicts that its overall sales in electricity would remain the same or increase slightly (up to eight percent). The expected increases in energy efficiency and solar photovoltaic production are expected to offset a majority of the growth in electric vehicles, as well as economic and population driven growth (PG&E, 2018)

The potential increase in electric vehicles under the Strategies in the West Oakland Community Action Plan are within the range of vehicles that PG&E has forecast for its service area of two million vehicles. In addition to the vehicles, electricity may also be supplied to the Port and Schnitzer Steel to power marine vessels while at berth. The electricity to power a marine vessel is estimated to be 0.42 GWh, which is a very small increase in overall electricity use (less than 0.0005 percent). Therefore, implementation of the Strategies in the West Oakland Community Action Plan is not expected to result in significant impacts to energy/electricity, over those already contemplated in the PG&E service areas. Further, energy impacts associated with the Plan are not cumulatively significant and would not make a considerable contribution to a cumulatively significant energy impact.

1.4.3 GREENHOUSE GAS EMISSIONS

1.4.3.1 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 carbon dioxide (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.

Fuel combustion activities account for approximately 82 percent of the GHGs emitted in the State. 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. Under "business as usual" conditions, GHG emissions are expected to grow in the future due to population growth and economic expansion.

The City of Oakland has completed a Draft Energy and Climate Action Plan, which includes an updated analysis of community-wide emissions. Oakland estimates that it emitted approximately 3.4 million metric tons of CO_2 equivalent (CO_2e) emissions in 2005 from all areas sources and highway transportation sources. Of these emissions, transportation generated the most emissions (50 percent), following by building energy use (37 percent) and methane from solid waste landfills (four percent).

1.4.3.2 Greenhouse Gas Emissions Impacts

Implementation of the Strategies in the West Oakland Community Action Plan by the Air District would result in a minor increase in GHG emission increases associated with construction emissions and the potential delivery of materials to supply air emission control systems that would be implemented as part of the Plan. The potential GHG emission increases are expected to be offset with emission decreases that would occur due to implementation of the Plan, such as a reduction in fuel use due to implementation of zero and near-zero vehicles and potential electrification of marine vessels at berth.

Based on the evaluation of the Strategies that the Air District would implement as part of the West Oakland Community Action Plan, the GHG emission reductions associated with the Plan are expected to exceed the potential GHG emission increases and there would be no net GHG emission increases. Therefore, GHG impacts would be less than significant. Further, GHG impacts are not cumulatively significant and would not make a considerable contribution to cumulatively significant GHG impacts.

1.4.4 HAZARDS AND HAZARDOUS MATERIALS

1.4.4.1 Hazards and Hazardous Materials Setting

Within West Oakland, there are a total of 123 reported contaminated sites. Nearly 65 percent of these reported contaminated sites have been closed by the respective oversight agencies. Of those sites that remain open, remediation efforts are still needed before new development can occur. Within those closed case sites, the level of prior clean-up efforts may vary and may be appropriate only for commercial or industrial uses, may have deed restrictions preventing sensitive uses, or may stipulate additional agency oversight should development be considered.

The majority of reported environmental cases within West Oakland are attributed to leaking underground storage tanks, most of which contain, or used to contain petroleum products, e.g., gasoline. However, there are also a number of reported cases of more complex and hazardous incidents where toxic chemicals have been spilled or released into the soils and groundwater, resulting in potential health and safety concerns for residents and employees of the area.

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 Bay Area in great quantities via all modes of transportation including rail, highway, water, air, and pipeline.

In 2018, there were a total of 1,396 hazardous materials incidents reported in the nine counties regulated by the Air District, with the most incidents (380) reported in Alameda County, followed by Contra Costa County (245). Hazardous materials incidents during transportation, in residential areas, and at waterways were the most common locations, respectively, for hazardous materials incidents.

1.4.4.2 Hazards and Hazardous Materials Impacts

Control measures have the potential to create hazards and hazardous materials impacts. Strategies could result in an increase in the use and transport of hazardous materials (e.g., ammonia). The use of aqueous ammonia or urea would minimize potential hazards associated with ammonia use as it would not be expected to form a vapor cloud and migrate offsite, impacting residential areas.

Strategies in the Plan could increase the use of hydrogen fuel cells. Hydrogen is non-toxic and disperses more readily in air than gasoline or diesel. The health hazards associated with hydrogen are approximately equivalent or less than the hazards associated with conventional fuels. Further regulations, codes and standards related to hydrogen infrastructure safety address all key aspects of the system design, construction, operation, and maintenance. Compliance with these requirements should reduce the potential hazards associated with hydrogen use to less than significant.

Implementation of the Strategies in the Plan could require construction activities within sites that have been contaminated. Any required treatment, remediation or disposal of contaminated soil or groundwater would be required to comply with all local, State, and federal regulations that address releases, air quality impacts (dust and hydrocarbon vapors), personal protection, and transportation requirements. With the compliance with the required local, State and federal regulations for treatment, remediation or disposal of contaminated soil or groundwater, the hazards to the public or the environment from hazardous materials at sites required for implementation of the Strategies in the West Oakland Community Action Plan, are expected to be less than significant.

The West Oakland Community Action Plan is not expected to result in significant hazards and hazardous materials impacts. Therefore, hazards and hazardous materials impacts associated with the Plan are not significant, are not cumulatively significant and would not make a considerable contribution to cumulatively significant hazards/hazardous materials impacts. The Air District concludes that the Plan will not result in any significant hazards or hazardous materials impacts, individually or cumulatively.

1.4.5 UTILITIES AND SERVICE SYSTEMS

1.4.5.1 Solid and Hazardous Waste Setting

There are a total of 14 active landfills within the nine counties that make up the Bay Area, with a total capacity of over 42,600 tons per day. Two active landfills are located within Alameda

County with a total capacity of 13,668 tons per day, the Altamont Landfill and Vasco Road Landfill. The Altamont Landfill is a Subtitle D-approved landfill providing non-hazardous Class II and Class III disposal and one of the largest landfill operations in Northern California. It accepts for disposal all non-hazardous municipal solid wastes (MSW), non-hazardous industrial and special wastes, de-watered wastewater treatment plant sludge (biosolids), treated auto shredder wastes, contaminated soils, liquids for solidification, asbestos wastes, yard waste for composting, and construction/demolition debris.

The Vasco Road Landfill is a 246-acre Class III municipal refuse disposal site and accepts residential, commercial, municipal garbage, but also recyclables and green waste. A portion of the landfill is Subtitle D-approved and meets the criteria and design requirements for a Class II waste management unit. It accepts for disposal construction materials and debris, metals, organics, paper, plastic, and tires.

There are no hazardous waste disposal sites within the Bay Area. Hazardous waste generated at area facilities, which is not reused on-site, or recycled, is disposed of at a licensed in-state hazardous waste disposal facility. Two such facilities in California are the Chemical Waste Management Kettleman Hills facility in King's County, and the Laidlaw Environmental Services facility in Buttonwillow (Kern County). Hazardous waste can also be taken to out-of-state facilities for treatment/disposal.

The most common types of hazardous waste generated in Alameda County include contaminated soils from site remediation efforts, asbestos-containing waste, organic solids, inorganic solid waste, oil/water separation sludge, and waste/mixed oils. Not all hazardous wastes generated are disposed of in a hazardous waste facility or incinerator. Many of the wastes generated, including waste oil, are recycled.

1.4.5.2 Utilities and Service Systems Impacts

The District's Strategies of feasibility studies, grants/incentives for future programs of energy upgrades and high efficiency air filtration systems, and investigation on the conversion of sources from conventional to zero emission sources and cleaner engines will have less than significant impacts on solid/hazardous waste. The amount of solid and hazardous waste generated is expected to be minimal and not expected to exceed the capacity of designated landfills. There will be an increase in wastes generated from the increased use of zero and near-zero emission vehicles and the subsequent generation of batteries, and other types of waste from mobile sources and air pollution control technology. However, due to the recycling value of the materials involved, most of the generated wastes would be recycled. Therefore, the potential solid/hazardous waste impacts were found to be less than significant impacts. Utility and service system impacts associated with the Plan are not cumulatively significant and would not make a considerable contribution to cumulatively significant utilities and service systems impacts.

1.5 EXECUTIVE SUMMARY: CHAPTER 4 – ALTERNATIVES ANALYSIS

This EIR provides a discussion of alternatives to the proposed project as required by CEQA. Pursuant to the CEQA guidelines, alternatives should include realistic measures to attain the basic objectives of the proposed project but would avoid or substantially lessen any of the significant effects of the project, and provide means for evaluating the comparative merits of each alternative (CEQA, Guidelines, §15126.6(a)). 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. An EIR need not consider an alternative whose effect cannot be reasonably ascertained and whose implementation is remote and speculative (CEQA Guidelines, §15126.6(f)(3). Because no significant impacts have been identified for the proposed project, alternatives are not required to be analyzed in this EIR. However, in order to provide a full environmental review and fulfill the intent of CEQA, an alternatives analysis has been prepared. Two alternatives were evaluated in the EIR.

Alternative 1 – No Project Alternative: CEQA requires the evaluation of the No Project Alternative, which consists of what would occur if the proposed project was not approved; in this case, not adopting the West Oakland Community Action Plan. There would be no Strategies to control stationary or mobile emission sources. The land use Strategies to limit exposure to emissions would also not be implemented, nor would the health programs to limit exposure to and improve the health of residents and sensitive receptors in West Oakland. Alternative 1 would not comply with AB 617, which directs communities and air districts to work together to address air pollution and related health effects in overburdened communities, like West Oakland.

Alternative 2 – District Only Strategies: Under Alternative 2, only the Strategies for which the Air District has jurisdiction would be implemented. Alternative 2 would only partially meet the requirements of AB 617, as the Strategies to be implemented by other agencies would not occur at this time.

Alternative 1, the No Project Alternative, would reduce potential impacts associated with the proposed project as no Strategies in the Plan would be implemented. Alternative 1 would also eliminate any criteria or TAC emission reductions and eliminate the beneficial impacts of the Plan and would not achieve any of the project objectives. Alternative 2 would have essentially the same impacts as the proposed project because the same Strategies evaluated as part of the project would be implemented under Alternative 2. Alternative 2 would not result in any significant impacts and would be expected to achieve some of the emission reductions in the project objectives, but not all. Alternative 2 would be considered the environmentally superior alternative as it would achieve more of the project objectives and emissions reductions than Alternative 1.

The proposed project would be considered the preferred alternative as it would be expected to achieve all of the project objectives and emission reductions associated with the implementation of the Plan and would be expected to reduce the emissions and related health impacts to the West Oakland Community more effectively than Alternative 2. Therefore, the proposed project is the preferred alternative.

1.6 EXECUTIVE SUMMARY: CHAPTER 5 – REFERENCES

Chapter 5 provides the references for the EIR.

TABLE 1-1

Summary of Environmental Impacts, Mitigation Measures and Residual Impacts

Impact	Mitigation Measures	Residual Impacts
Air Quality		
The estimated criteria pollutant emission reductions from the Plan are expected to outweigh any potential secondary emission increases associated with the Plan, providing a beneficial impact on air quality.	None Required	Air quality impacts are less than significant.
It is expected that the Plan Strategies would result in an overall reduction in toxic air contaminant emissions.	None Required	Emissions of toxic air contaminants would be less than significant.
Energy		
The potential increase in electricity associated with the Plan is less than PG&E has already forecast for its service area. No significant impacts to energy are expected due to implementation of the Plan.	None Required	Energy impacts are less than significant.
Greenhouse Gas Emissions		
The estimated GHG emission reductions from the Plan are expected to outweigh the potential GHG emission increases associated with the Plan, providing a beneficial impact on climate change.	None required.	GHG emissions are expected to remain less than significant.

TABLE 1-1

Summary of Environmental Impacts, Mitigation Measures and Residual Impacts

Impact	Mitigation Measures	Residual Impacts
Hazards and Hazardous Materials		
Hazard impacts associated with the use and transport of hazards materials for new air pollution control equipment are expected to be less than significant assuming the use of aqueous ammonia in SCRs.	None Required	Hazards impacts from use of new air pollution control equipment would be less than significant.
Use of hydrogen fuel cells is not expected to result in significant impacts as compliance with regulations, codes, and standard related to hydrogen infrastructure addresses all key safety aspects of the design, construction, operation and maintenance of these facilities.	None required.	Hazards associated with the use hydrogen fuel cells would be less than significant.
Construction activities at contaminated sites would require compliance with local, State and federal regulations for treatment, remediation and disposal of contaminated materials, reducing impacts to less than significant.	None required	Hazards associated with construction activities at contaminated sites would be less than significant.
Utilities and Service Systems		
Solid and hazardous waste impacts due to implementation of the Plan are expected to be less than significant, as waste that may be generated would be largely recyclable.	None required.	Utilities and service system (solid and hazardous waste) impacts associated with the Plan are expected to remain less than significant.

CHAPTER 2

PROJECT DESCRIPTION

This page intentionally left blank.

2.0 PROJECT DESCRIPTION

2.1 INTRODUCTION

Assembly Bill (AB) 617 (C. Garcia, Chapter 136, Statutes of 2017) asks communities and air districts to work together to address air pollution and related health effects in overburdened communities like West Oakland. AB 617's community-focused approach provides a new framework for addressing the long-standing disparities in air pollution and related health effects across the state.

AB 617 requires the adoption and implementation of emissions reduction plans for communities with disproportionate impacts from air pollution. Pursuant to AB 617, the Bay Area Air Quality Management District (Air District) and the West Oakland Environmental Indicators Project jointly developed a community emissions reduction plan, referred to as the Community Action Plan, for West Oakland. The proposed plan includes strategies at the community level to maximize emission reductions and reduce residents' cumulative exposure to criteria air pollutants, diesel particulate matter (Diesel PM), fine particulate matter ($PM_{2.5}$), and toxic air contaminants (TAC). The West Oakland Community Action Plan is an integrated multi-pollutant community air quality plan to eliminate air pollution disparities and improve public health in West Oakland. The Community Action Plan documents the Steering Committee's effort to study air pollution in West Oakland, and identifies and prioritizes Action Strategies that once implemented, will work towards eliminating West Oakland's air pollution burden.

The government agencies with primary responsibility for implementing the strategies in the Community Action Plan include the Air District, California Air Resources Board (CARB), City of Oakland, Port of Oakland, Alameda County Public Health Department, CalTrans, Alameda County Transportation Commission, and Metropolitan Transportation Commission.

2.2 BACKGROUND

AB 617 directs CARB, in consultation with local air districts, to identify and select communities that have a high cumulative exposure burden to air pollution. Once selected, these communities will work with local air districts on community emission reduction programs and/or air quality monitoring requirements. With the adoption of AB 617, the state acknowledges that many communities around California continue to experience disproportionate impacts from air pollution. AB 617 requires all of the following and more:

1. Air Districts in nonattainment areas must implement Best Available Retrofit Control Technologies (BARCT) on all sources subject to the AB 32 Cap-and-Trade Program. The Air District approved their BARCT update schedule in December 2018.

2. CARB must establish and maintain a clearinghouse of best available control technology (BACT), and BARCT.
3. Air pollution violation maximum penalties were increased and will adjust with inflation.
4. CARB was required to prepare an air monitoring plan for all areas of the state by October 1, 2018.
5. Based on air monitoring plan information, CARB must select communities with high cumulative exposure burden to both toxic and criteria air pollutants by July 1, 2019.
    a. Each air district with a high cumulative burden community must deploy a community air monitoring system in that community within one year, and provide the air quality data to CARB for publication.
6. By January 1, 2020, and each January 1 thereafter, CARB will select additional communities with high cumulative exposure burden.
    a. Each air district with a high burden community must deploy a community air monitoring system in that community within one year, and provide the air quality data to CARB for publication.
7. CARB must prepare a state-wide strategy to reduce emissions of toxic and criteria pollutants in communities affected by high cumulative exposure burden, by October 1, 2018, and update the strategy every five years. Criteria for the state-wide strategy recognized that disadvantaged communities and sensitive receptors are a priority, and include:
    a. A methodology for assessing and identifying contributing sources, and estimating their relative contribution to elevated exposure (source apportionment).
    b. Assessment of whether an air district should update and implement the risk reduction audit and emissions reduction plan for any facility if the facility causes or significantly contributes to the high cumulative exposure burden.
    c. Assessment of available measures for reducing emissions including BACT, BARCT, and toxics best available control technology (TBACT).
8. CARB selected locations for preparation of Community Emission Reduction Plans by October 1, 2018. CARB will select additional locations annually thereafter.
    a. Within one year, the air districts will adopt Community Emission Reduction Plans in consultation with CARB, individuals, community-based organizations, affected sources, and local governmental bodies.
    b. By October 2019, air districts adopt programs in first-year communities selected for community emissions reduction programs.
    c. The air districts' deadline to adopt the community emissions reduction programs is one year from community selection, which is October 1, 2019 for the first set of communities selected.
    d. The Community Emission Reduction Plans must be consistent with the state-wide strategy, and include emission reduction targets, specific

reduction measures, a schedule for implementation of the measures, and an enforcement plan.

e. The Community Emission Reduction Plans must be submitted to CARB for review and approval.
f. The Community Emission Reduction Plans must achieve emission reductions in the community, based on monitoring or other data.
g. The air districts must prepare an annual report summarizing the results and actions taken to further reduce emissions.

9. CARB will provide grants to community-based organizations for technical assistance and to support community participation in identification of communities with high exposure burden, and development and implementation of the Community Emission Reduction Plans.

AB 617 represents a significant enhancement to the approach CARB and local air districts take in addressing local air quality issues. The Air District has begun implementing programs that follow on from AB 617; these programs include the Community Air Risk Evaluation (CARE) Program, Health Risk Assessments for the AB 2588 Air Toxics "Hot Spots" Program, and Air District Rule 11-18: Reduction of Risk from Air Toxic Emissions at Existing Facilities. However, AB 617 presents additional requirements and establishes challenging goals and timelines for implementation.

In August 2018, the District submitted the Community Health Protection Program to CARB which recommended the communities for the first five years of the state's Community Air Protection Program. The Air District recommended that West Oakland be eligible for a Community Action Plan in the first year of the AB 617 program. Maritime-freight industries, rail, large distribution centers, a concrete batch plant, a peaker power plant, metal facilities, small to medium industrial and manufacturing operations, major freeways and busy roadways used as trucking routes all impact the West Oakland community. These sources contribute to high levels of particulate matter less than 2.5 microns in diameter ($PM_{2.5}$) concentrations and elevated cancer risk from toxic air contaminants. West Oakland is considered one of the most impacted areas in the San Francisco Bay Area due to the area's many sources of diesel particulate matter. As such, CARB approved West Oakland as a first-year priority community in the Bay Area. In addition, CARB approved Richmond for a Community Air Monitoring Plan. The currently proposed project will implement the required community emission reduction plan required under AB 617, which is referred to as the West Oakland Community Action Plan herein.

2.3 AGENCY AUTHORITY

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 this project and has prepared the Notice of Preparation of a Draft Environmental Impact Report (DEIR) and Initial Study for the proposed West Oakland Community Action Plan.

The Lead Agency is the "public agency which has the principal responsibility for carrying out or approving a project which may have a significant effect upon the environment." (Public Resources Code Section 21067). It was determined that the Air District has the primary responsibility for supervising or approving the project as a whole and is the most appropriate public agency to act as lead agency (See CEQA Guidelines Section 15051).

The Plan calls upon government agencies, community members, business owners, and others to commit resources and funding to implement the Plan. The Strategies build on and complement planning activities in West Oakland by a variety of public agencies over the past fifteen years. Steering Committee members, community members, and business owners may need to write letters and emails, make telephone calls, and attend agency public meetings to communicate to various public agencies their continued support for Plan implementation.

The Steering Committee also will work with various public agencies to implement the Plan Strategies. The City and the Port will be key partners. This work will include more investigation into the Strategies to understand authority, legality, effectiveness, and feasibility. The agencies with the largest roles in implementation are described below, including examples of Strategies applicable to each agency. Commitment from and cooperation with these agencies is central to the success of the Plan.

Air District

The Air District is the regional agency responsible for assuring clean air in the San Francisco Bay Area. The Air District regulates emissions from stationary sources, issues and enforces permits, provides grants and incentives, provides technical and policy guidance, engages with communities, and more. Stationary sources in West Oakland include the East Bay Municipal Utility District wastewater treatment plant; recycling facilities like Schnitzer Steel, CASS, and California Waste Solutions, gas stations, back-up diesel generators, and auto-body shops. For the Plan, the Air District will implement strategies that include enhancing existing and adopting new regulations, enhancing compliance and enforcement, funding emissions- and exposure-reducing projects, and working with community and agency partners to advocate for, study, and implement innovative ways to decrease emissions and exposure to emissions in West Oakland. (Strategies #14, #24, #43, #44, #48, #61, #63, and #64).

California Air Resources Board (CARB)
CARB is the state agency responsible for establishing the state's air quality standards to protect human health, regulating mobile and other sources, and overseeing activities of regional air districts. CARB regulates motor vehicle fuel specifications, emission standards for on- and off-road vehicles, and consumer product emissions. AB 617 directs CARB to work with local air districts in California to address the disproportionate air quality and health challenges in communities like West Oakland. For the Plan, CARB will adopt and enforce regulations for mobile sources such as heavy-duty trucks and light-duty vehicles that travel through West Oakland and on the surrounding roadways and freeways, and for sources at the Port of Oakland, such as cargo equipment, port trucks, locomotives, and ocean-going ships and harbor craft in the San Francisco Bay (Strategies #28, #29, #30, #55, and #57).

City of Oakland
The City of Oakland is the local agency responsible for land-use and transportation decisions. The City Council makes land-use decisions by adopting general and specific plans, zoning regulations, and certifying environmental reports for land-use projects, such as housing, commercial, and industrial developments. The West Oakland Specific Plan is an example of a land-use plan that the City has adopted. The West Oakland Truck Management Plan is an example of a measure required by an environmental report on a land-use development project and an example of City transportation authority. For the Plan, the City of Oakland will implement strategies that address air pollution impacts from land use and transportation, such as Strategies #1 and #4-11.

Port of Oakland
The Port of Oakland is the local agency responsible for managing the Oakland seaport, Oakland International Airport, and Jack London Square. The City of Oakland's Charter establishes the Port of Oakland as an independent department with its own governing board. The Seaport Air Quality 2020 and Beyond Plan is an example of the Port's effort to manage operations at and air pollution from the Port. For the Plan, the Port will implement strategies that address air pollution from Port and Port tenant activities, such as the movement of inbound and outbound freight on cargo equipment, port trucks, locomotive, and ocean-going ships and harbor craft in the San Francisco Bay (Strategies #19, #32, #38, #58, #59, and #60).

Alameda County Public Health Department
The Alameda County Public Health Department is the county department responsible for providing public health services. The Health Department delivers services such as access to quality medical care services, disease prevention education and control, community education and outreach, and health policy development. The Healthy Development Guidelines is an example of the policy work that the Public Health Department delivers. For the Plan, the Public Health Department will implement strategies such as those that help the community access health services and educate the community about health risks, treatment, and prevention (Strategies #79, #80, and #81).

Alameda County Transportation Commission (ACTC)

The Alameda County Transportation Commission (ACTC) is the county agency responsible for managing the county's one-cent transportation sales tax funds and funding transportation projects and programs. The ACTC is responsible for delivering the County's bicycle, pedestrian, highway improvements, road, and transit projects. For the Plan, the ACTC will implement Plan Strategies, such as those that advocate for improved bicycling and pedestrian infrastructure in West Oakland (Strategies #39, #40, #41, #42, and #84).

Metropolitan Transportation Commission (MTC)

The Metropolitan Transportation Commission (MTC) is the regional agency responsible for transportation planning, financing, and coordinating for the nine-county San Francisco Bay Area. The San Francisco Bay Area Goods Movement Plan and MTC Resolution No. 4244: Goods Movement Investment Strategy are examples of MTC's effort to plan, finance, and coordinate transportation in the Bay Area. For the Plan, MTC will help implement Strategies that extend car sharing to low income individuals and groups (Strategy #41).

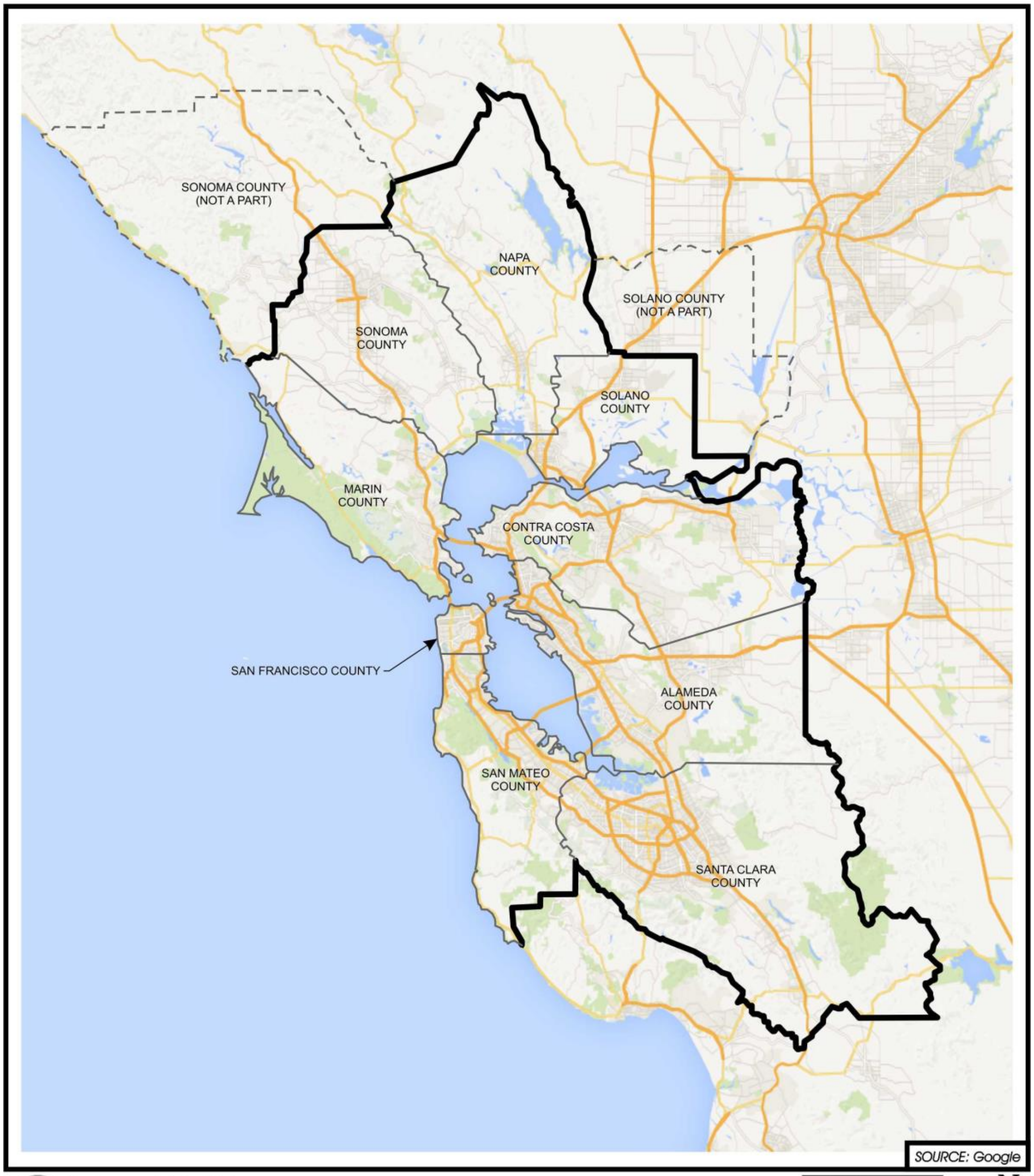
California Department of Transportation (Caltrans)

The California Department of Transportation (Caltrans) is the state agency responsible for maintaining and improving state highways and transportation projects. For the Plan, Caltrans will implement Plan Strategies such as studies to determine the feasibility of vegetative biofilters between the Prescott neighborhood and Interstate 880 and work with West Oakland Environmental Indicators Project and the Air District to address air quality issues from truck parking leases on Caltrans right-of-way (Strategies #7, #16 and #84).

2.4 PROJECT LOCATION

The Air District 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 2-1).

The proposed Community Action Plan will apply to West Oakland, which is part of the City of Oakland (see Figure 2-2). West Oakland is bounded by the Port of Oakland, the Union Pacific rail yard, and Interstates 80, 580, 880, and 980 (see Figure 2-3).



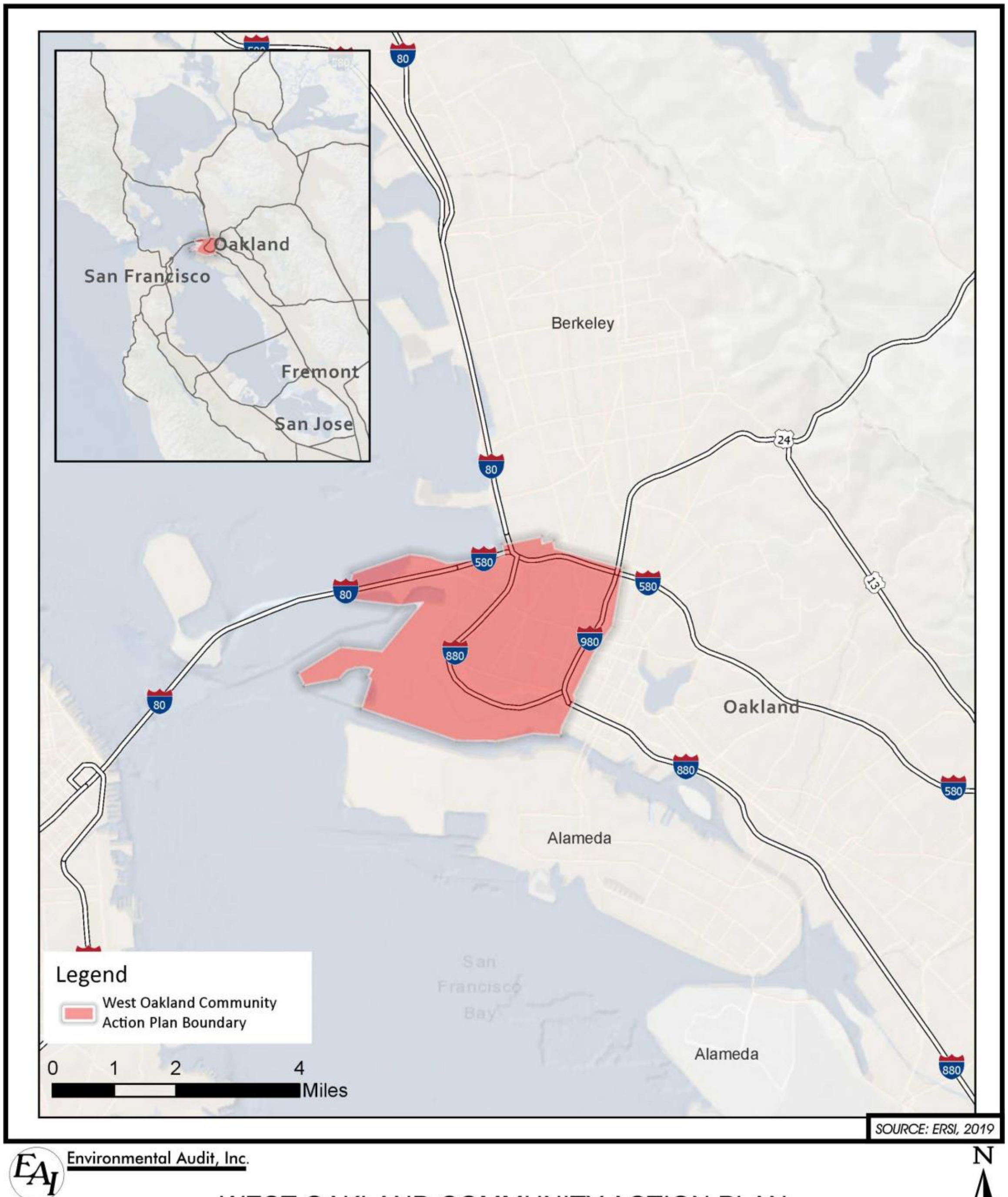
Environmental Audit, Inc.

0 ~22mi. N

BAY AREA AIR QUALITY MANAGEMENT DISTRICT
JURISDICTION

Project No. 3100 Figure 2- 1

N:\3100\BAAQMD Map.cdr



WEST OAKLAND COMMUNITY ACTION PLAN
REGIONAL AND VICINITY MAP

Project No. 3100

Figure 2- 2

N:\3100\Regional Map.cdr

WEST OAKLAND COMMUNITY ACTION PLAN
PLANNING BOUNDARY

Project No. 3100

Figure 2- 3

N:\3100\Planning Boundary.cdr

2.5 OBJECTIVES OF THE WEST OAKLAND COMMUNITY ACTION PLAN

The objectives of the West Oakland Community Action Plan are to provide the following benefits:

1. For the Air District and West Oakland community to work together to address the disparities in air pollution and related health effects in the West Oakland community.
2. To reduce criteria pollutant and toxic air contaminant emissions from stationary sources of air pollution sources within and adjacent to West Oakland.
3. To reduce criteria pollutant and toxic air contaminant emissions from mobile sources, such as heavy-duty trucks and light-duty vehicles that travel in West Oakland and on surrounding freeways and streets;
4. To reduce criteria pollutant and toxic air contaminant emissions from mobile sources that serve the Port of Oakland, such as cargo equipment, port trucks, locomotives, ocean-going ships, and harbor craft in the San Francisco Bay; and
5. To improve the health of residents, workers, and visitors to West Oakland through a reduction in emissions and exposure to air pollutants.

2.6 PROJECT DESCRIPTION

The West Oakland Community Action Plan is a joint effort between the West Oakland Environmental Indicators Project (Indicators Project) and the Air District, with direction from the West Oakland Community Action Plan Steering Committee. The West Oakland Environmental Indicators Project has a long history of community planning and advocacy to reduce residents' exposure to diesel particulate matter (Diesel PM), fine particulate matter ($PM_{2.5}$), and toxic air contaminants (TACs). The Steering Committee members are local stakeholders, including residents, community and local business leaders, and government agency representatives.

The Community Action Plan was developed through monthly meetings with the West Oakland Steering Committee, which began working on the Plan in July 2018. The Plan provides strategies for addressing the long-standing disparities in air pollution and related health effects in West Oakland. Once implemented, the Plan will work towards eliminating West Oakland's air pollution burden.

The goal of the Community Action Plan is to reduce emissions from air pollution sources within and adjacent to West Oakland air pollution sources, including:

1. Stationary sources in West Oakland and adjacent to West Oakland, such as the East Bay Municipal Utility District wastewater treatment plant; recycling facilities such as Schnitzer Steel, CASS, and California Waste Solutions, Incorporated; gas stations, back-up diesel generators, and auto-body shops;

2. Mobile sources, such as heavy-duty trucks and light-duty vehicles that travel in West Oakland and on the surrounding freeways; and
3. Mobile sources that serve the Port of Oakland, such as cargo equipment, port trucks, locomotives, ocean-going ships, and harbor craft in the San Francisco Bay.

The proposed strategies included in the Community Action Plan are summarized in Table 2.6-1. A summary of those strategies is provided below.

2.6.1 STATIONARY SOURCE STRATEGIES

The Plan includes strategies to further control emissions from stationary sources in West Oakland. Strategies to control stationary sources include considering: (1) replacing stationary diesel engines with Tier 4 diesel or cleaner engines; (2) reformulation of vanishing oils and rust inhibitors; (3) reducing toxic air contaminant emissions from existing industrial sources including Schnitzer Steel and the East Bay Municipal Utility District's Wastewater Treatment Plant; (4) potential new or amended regulations to further reduce emissions from metal recycling and foundry operations; (5) developing a regulation to reduce emissions of reactive organic gases and other toxic compounds from organic liquid storage tanks; and (6) identifying incentives to emissions from waste water treatment plants and anaerobic digestion facilities. The District will also consider developing an magnet source regulation to reduce emissions from freight operations.

2.6.2 MOBILE SOURCE STRATEGIES

The Plan includes strategies to reduce emissions from mobile sources including vehicles, trucks, locomotives, and ships. A number of strategies would encourage the early retirement of old vehicles, increased use of zero emissions trucks, buses, and vehicles operating in West Oakland. Strategies to control emissions from locomotives and ships include: (1) increasing the use of shore-power or other emission control systems by vessels at berth in the Port of Oakland; (2) encouraging use of Tier 3 and 4 compliant diesel engines on tugs and barges; and (3) encouraging use of Tier 4 compliant engines on locomotives. A number of strategies would increase enforcement on a variety of different activities including illegal parking, excess idling, and not using appropriate truck routes.

2.6.3 OTHER MOBILE SOURCE STRATEGIES

The Plan encourages other strategies to reduce emissions from mobile sources including: (1) encouraging car sharing for low-income individuals; (2) providing pedestrian and bicycle improvements to increase use of public transit, e.g., BART; (3) increasing street sweeping to minimize the re-entrainment into the air of particulates that collect on streets and freeways; (4) developing safe routes to school to minimize conflicts between pedestrians and trucks/vehicles; and (5) considering improvements to public transit along Grand Avenue.

2.6.4 LAND USE STRATEGIES

Land use strategies are aimed at modifying land uses to limit exposure to emissions. Under this category, the Plan includes strategies to reduce exposure to emissions by: (1) relocating California Waste Systems and CASS to move sources away from sensitive receptors; (2) accelerating the relocation of auto and truck-related businesses that are non-conforming land uses; (3) developing regulations to prohibit certain freight businesses and truck yards in portions of West Oakland; (4) increasing urban tree planting and vegetative biofilters along streets/truck routes to help reduce exposure to emissions; (5) adopting development impact fees to fund various environmental mitigations including green infrastructure and transportation improvements; (6) installing solid barriers between buildings and air pollution sources (e.g., freeways) to reduce exposure to air pollution; (7) increasing electrical infrastructure to encourage zero emissions vehicles/trucks; and (8) improving and updating the complaint processes, enforcement procedures and coordination with other public agencies to better respond to odors and open burning complaints.

2.6.5 HEALTH PROGRAMS

Health Program strategies are aimed at generally reducing exposure to air pollution. These strategies could include: (1) the installation of high efficiency air filtration systems on buildings to reduce exposure; (2) relocating exhaust stacks to reduce local exposure to air pollutants; (3) providing additional air monitoring to better detect sources of air pollution; and (4) better reporting of health data to identify public health impacts, as well as improvements.

Implementation of the Community Action Plan, once approved, will be the responsibility of the Air District and the Indicators Project with the support and coordination of a number of governmental agencies including the City of Oakland, Port of Oakland, and CARB the Alameda County Public Health Department, and others.

TABLE 2.6-1

West Oakland Community Action Plan Proposed Strategies

#	Strategies	Authority
	Land Use	
1	The City of Oakland continues working with California Waste Solutions and CASS, Inc. to relocate operations to the former Oakland Army Base and works with the property owners and local residents to redevelop the former sites in West Oakland with new business and light industrial uses that fit into a green economy.	City of Oakland
2	The Air District will continue to engage in environmental review processes for development projects in West Oakland, such as the Oakland A's Ballpark and the MacArthur Maze Vertical Clearance Project, including coordinating with community partners and lead agency staff, providing data and technical assistance, and reviewing and commenting on CEQA documents through 2025.	Air District
3	The Air District will study the potential air pollution and health outcomes of allowing truck traffic on I-580 and designating a truck lane on I-880. Allowing truck traffic on I-580 would require legislative approval, re-engineering, and re-construction.	Air District
4	Consistent with measures in the West Oakland Specific Plan, the City of Oakland identifies locations outside of West Oakland for heavier industrial businesses currently in West Oakland that contribute to air pollution emissions and negative health outcomes in West Oakland.	City of Oakland
5	The City of Oakland and Port of Oakland amends existing Ordinances, Resolutions, or Administrative policies to accelerate relocation of truck yards and truck repair, service, and fueling businesses in West Oakland currently located within the freeway boundaries that do not conform with the zoning designations adopted in the West Oakland Specific Plan.	City of Oakland, Port of Oakland
6	The City of Oakland uses incentives and subsidies to relocate businesses away from West Oakland that do not conform with the zoning designations adopted in the West Oakland Specific Plan. The Air District will provide emissions data and technical support to assist the City in these efforts and to ensure that any relocated businesses do not cause exposure issues at the new location.	City of Oakland, Air District
7	The City of Oakland revises business licensing procedures to require current and proposed businesses to disclose truck visits per day and works with Caltrans to determine the number of trucks that park in the Caltrans right-of-way near West Oakland. Caltrans works with WOEIP and the Air District to address air quality issues from truck parking leases, such as by modifying leases to allow for collecting surveys and partnering with the Air District and CARB to allow enforcement access.	City of Oakland, Caltrans
8	The City of Oakland amends existing City Ordinances and Administrative policies to list new truck yards and truck service, repair and fueling businesses as prohibited uses within the area of West Oakland that is inside the freeways (excluding the Port, OAB, and 3rd St. corridor of Jack London Square from Brush St. to Union St.).	City of Oakland
9	The City of Oakland develops a plan to limit the hours that trucks can operate in the community.	City of Oakland
10	The City of Oakland creates a comprehensive, area-wide urban canopy and vegetation plan that identifies locations that trees can be added and maintained, such as parks and along Caltrans' right-of-ways, and develops a plan to protect existing trees that reduce exposure to air pollution emissions in West Oakland. This includes partnering with local nonprofit groups and encouraging trees on private property.	City of Oakland, Caltrans
11	The City of Oakland works with local groups to train residents to maintain biofilters.	City of Oakland

#	Strategies	Authority
12	The Air District and the West Oakland Environmental Indicators Project intends to implement the green infrastructure project currently under development between Interstate I-880 and the Prescott neighborhood in West Oakland by 2021.	Air District
13	The City of Oakland conducts a study regarding development fees for environmental mitigations.	City of Oakland
14	The Air District provides subsidized loans for local small businesses to install energy storage systems (e.g. batteries, fuel cells) to replace stationary sources of pollution (e.g. back-up generators).	Air District
15	The City of Oakland continues requiring new developments to provide infrastructure for electrical vehicle charging stations.	City of Oakland
16	The City of Oakland, in partnership with the Steering Committee, CARB and the Air District, studies the exposure reduction benefit of requiring solid or vegetative barriers to be incorporated into site design between buildings and sources of air pollution (for example, a freeway).	City of Oakland CARB, Caltrans, Air District
17	The City of Oakland adopts policies to lessen air quality impacts of residential and office buildings through the reduction or elimination of natural gas systems.	City of Oakland
18	The Air District advocates for more electrical infrastructure and power storage, including development of (1) fast-charging facilities, (2) truck charging stations and (3) better land use support for electric trucks by 2025.	PG&E
19	The Port of Oakland adopts an Electrical Infrastructure Plan for the maritime waterfront areas of Oakland. This Plan seeks to remove barriers to adoption of zero-emission trucks, such as cost, land, and ownership of charging equipment.	Port of Oakland
20	The City of Oakland revises development requirements to require the implementation of as many transportation demand management (TDM) strategies as feasible by developers of new buildings.	City of Oakland
21	The Air District works with the City and Port of Oakland and other agency and local partners to create a Sustainable Freight Advisory Committee to provide recommendations to each agency's governing board or council. The Committee's scope includes: air quality issues, enhanced/increased enforcement of truck parking and idling, improved referral and follow-up to nuisance and odor complaints related to goods movement, improvements to the Port appointment system, charging infrastructure and rates, developing land-use restrictions in industrial areas, and consideration of video surveillance to enforce truck parking, route, and idling restrictions.	Air District, Port of Oakland, City of Oakland
22	The City of Oakland adopts more stringent air quality construction and operations requirements.	City of Oakland
23	The City adds the AB 617 Steering Committee Co-Chairs to the official lists to receive notification of "Applications on File" for discretionary planning projects and "Meeting Agendas" of the Planning Commission and its five subcommittees, and the Landmarks Preservation Board.	City of Oakland
24	The Air District works with agency and local partners to improve referral and follow-up on nuisance and odor complaints by 2021. This work includes updates to complaint processes, enforcement procedures, and coordination with other public agencies regarding odors, backyard burning, and other complaints.	Air District
25	To address potential changes in local pollution exposure, the City of Oakland works with local community groups to address gentrification and the pricing out of long-term residents caused by gentrification. This effort includes meetings with local community groups and incentives and loans targeted to existing businesses and residents. Funding for this effort is identified as needed.	City of Oakland
26	The City and Port of Oakland will work to establish permanent locations for parking and staging of Port related trucks and cargo equipment, i.e. tractors, chassis, and containers. Such facilities will provide long-term leases to parking operators and truck owner-operators at competitive rates. Such facilities will be at the City or Port logistics center or otherwise not adjacent to West	City of Oakland, Port of Oakland

#	Strategies	Authority
	Oakland residents.	
27	The City of Oakland and other appropriate local agencies limit fugitive dust from construction activity through better enforcement of existing regulations and permit requirements.	City of Oakland
	Mobile Sources	
28	The California Air Resources Board develops improvements to the existing truck and bus inspection and maintenance programs. Potential improvements include increasing warranty requirements, adding a lower in-use emissions performance level, increasing inspections in West Oakland, using aggregated GPS and other telecommunication records to identify locations of idling trucks and buses, and partnering with the Air District to develop a system using on-board diagnostic and remote sensing devices to identify and fix faulty emissions abatement devices on trucks and buses.	CARB
29	The California Air Resources Board develops the following regulations to increase the number of zero-emission trucks and buses operating in West Oakland: • The Advanced Clean Trucks regulation to transition to zero-emission technology those truck fleets that operate in urban centers, have stop-and-go driving cycles, and are centrally maintained and fueled. • Amendment to the drayage truck regulation to transition the drayage truck fleet to zero emissions.	CARB
30	The California Air Resources Board, in partnership with the Steering Committee, WOEIP and the Air District, conduct a pilot study to assess local idling impacts from trucks and buses. The Steering Committee, WOEIP and the Air District advocate for "Clean Idle" trucks and buses to idle no more than 5 minutes when in West Oakland.	CARB
31	The City of Oakland requires industrial and warehouse facilities to provide electrical connections for electric trucks and transportation refrigeration units in support of CARB regulations.	City of Oakland
32	The Port of Oakland, as part of the 2020 and Beyond Seaport Air Quality Plan, supports the transition to zero-emission drayage truck operations, including setting interim year targets out to 2035, coordinating an extensive zero-emission truck commercialization effort, working with the City of Oakland to amend local ordinances to increase the allowable weight limits for single-axle, zero-emission trucks on local streets located within the Port and the Oakland Army Base/Gateway areas, and developing an investment plan for needed upgrades to the Port's electrical infrastructure. The Port of Oakland also works with the California Public Utilities Commission and the California Energy Commission to study the development of time-of-day electric rate structures favorable to truck operators.	Port of Oakland
33	The City of Oakland, consistent with the West Oakland Truck Management Plan: 1) improves training for police officers, community resource officers, and parking control technicians who issue truck and trailer parking tickets; 2) changes the parking regulations so they are easier to enforce; 3) increases truck parking fines; 4) targets enforcement at specific times and locations; and 5) improves signage directing drivers to available truck parking.	City of Oakland
34	The City of Oakland, consistent with the West Oakland Truck Management Plan: 1) improves signage regarding existing truck routes; 2) works with businesses on preferred routes to use when destinations are not located on truck routes; and 3) adds to, or changes, truck routes and prohibited streets.	City of Oakland
35	The City of Oakland, consistent with the West Oakland Truck Management Plan, implements, in consultation with West Oakland residents, traffic calming measures to keep truck traffic off residential streets.	City of Oakland
36	The Air District works with CARB to streamline the process for providing financial incentives for fueling infrastructure, and for low and zero-emission equipment. The Air District increases outreach and assistance to individual owner-operators and small companies by providing two	Air District

#	Strategies	Authority
	workshops and enhanced outreach in West Oakland by 2022.	
37	The City and Port of Oakland award long-term leases to vendors that will deliver trucker services (including mini-market and convenience stores, fast food, and fast casual restaurants), and parking to keep trucks off West Oakland streets.	City of Oakland, Port of Oakland
38	The Port of Oakland studies the effects on truck flow and congestion due to increasing visits from larger container ships, the feasibility of an off-terminal container yard that utilizes zero-emission trucks to move containers to and from the marine terminals, and the potential efficiency gains from increasing the number of trucks hauling loaded containers on each leg of a roundtrip to the Port.	Port of Oakland
39	The Alameda County Transportation Commission works with West Oakland residents and businesses to develop mitigations to short- and long-term impacts caused by the construction of the 7th St Grade Separation East Project and the implementation of other elements of the GoPort Initiative.	ACTC
40	The City of Oakland collaborates with AC Transit, BART, Emery-Go-Round, and the local community to implement the broad array of transit improvements identified in the West Oakland Specific Plan.	City of Oakland, AC Transit, BART, City of Emeryville
41	The City of Oakland collaborates with MTC and ACTC to consider a program for extending car sharing to low-income individuals and groups.	City of Oakland, MTC, ACTC
42	AC Transit implements the Grand Avenue transit improvements identified in its Bus Rapid Transit Plan, as well as mitigations if the improvements cause increases in truck and auto idling on Grand Avenue.	AC Transit
43	The Air District plans to offer up to $7 million per year to replace older autos through the Vehicle Buy Back program, and up to $4 million per year through the Clean Cars for All program to replace older autos and provide an incentive for a hybrid electric, plug-in hybrid electric, battery electric vehicle, or Clipper Card for public transit.	Air District
44	The Air District offers financial incentives to replace box and yard diesel trucks with zero emission trucks owned by West Oakland businesses every year.	Air District
45	The Air District plans to offer financial incentives to upgrade tugs and barges operating at the Port of Oakland with cleaner engines every year.	Air District, Port of Oakland
46	The Air District plans to offer financial incentives to upgrade line-haul, passenger, and switcher (yard) locomotives with cleaner engines every year.	Air District
47	The Air District plans to offer financial incentives to support the development of a hydrogen refueling station and the purchase of trucks and off-road equipment powered by fuel cells every year.	Air District
48	The Air District offers financial incentives to replace long-haul diesel trucks with zero-emission trucks owned by West Oakland businesses every year.	Air District
49	The Air District will award up to $1 million in funding incentives to pay for the cost of purchasing cleaner equipment in West Oakland, potentially including: electric lawn and garden equipment, battery electric Transportation Refrigeration Units, and cargo-handling equipment, by 2021.	Air District
50	The Bay Area Rapid Transit District will develop a bike station with controlled access at the West	BART

#	Strategies	Authority
	Oakland BART Station.	
51	The City of Oakland implements the broad array of bicycle and pedestrian improvements identified in the West Oakland Specific Plan, the 2019 Oakland Bike Plan, and the 2017 Oakland Walks Pedestrian Plan.	City of Oakland
52	Through the Pilot Trip Reduction Program, the Air District offers incentives for the purchase of electric bicycles for bike share programs.	Air District
53	The Oakland Unified School District and the City of Oakland, as part of the Safe Routes to Schools Program in West Oakland, begin twice a day street closures next to public schools in West Oakland to keep cars and trucks away from arriving and departing students.	Oakland Unified School District, City of Oakland
54	The City of Oakland increases the frequency of street sweeping to decrease road dust, particularly on streets adjacent to schools, on designated truck routes, and on streets near freeways. The California Department of Transportation increases the frequency of street sweeping along the I-880, I-980, and I-580 freeways. Consideration is given to technology and techniques that avoid re-suspending road dust.	City of Oakland Caltrans
55	The California Air Resources Board develops amendments to the At-Berth Air Toxics Control Measure to further reduce ship emissions at berth by strengthening the regulation to cover more vessel visits and types of ships.	CARB
56	The California Air Resources Board develops amendments to the Commercial Harbor Craft Air Toxics Control Measure to achieve additional control of harbor craft emissions. The Steering Committee, WOEIP, and the Air District advocate for early compliance of harbor craft operating near West Oakland.	CARB
57	The California Air Resources Board develops regulations to reduce idling emissions from locomotives at rail yards with an emphasis on reducing emissions from locomotives not pre-empted under the federal Clean Air Act. The Steering Committee, WOEIP, and the Air District advocate for early compliance for locomotives operating in West Oakland.	CARB
58	The Port of Oakland implements a Clean Ship Program to increase the frequency of visits by ships with International Maritime Organization Tier 2 and Tier 3 engines.	Port of Oakland
59	The Port of Oakland implements a Clean Locomotive Program to increase the number of U.S. EPA Tier 4 compliant locomotives used by the UP, BNSF, and OGRE railways to provide service in and out of the Port of Oakland.	Port of Oakland
60	The Port of Oakland studies the feasibility of using electric switcher locomotives at the two Port railyards.	Port of Oakland
61	The Air District works with Schnizter Steel to study the feasibility of installing a shore-power or bonnet system to capture and abate vessel emissions at the West Oakland facility by 2021.	Air District
62	The Air District intends to seek authority in 2021 to reduce emissions and risk from magnet sources, such as the Port of Oakland, freight operations and warehouse distribution centers.	Air District
	Stationary Sources	
63	The Air District proposes amendments to existing regulations to further reduce emissions from metal recycling and foundry operations, such as changes to: 1) Rule 6-4: Metal Recycling and Shredding Operations, which requires metal recycling and shredding facilities to minimize fugitive PM emissions through the development and implementation of facility Emission Minimization Plans; and 2) Rule 12-13: Foundry and Forging Operations, which requires metal foundries and forges to minimize fugitive emissions of PM and odorous substances through the development and implementation of facility Emission Minimization Plans by 2025.	Air District
64	The Air District's Rule 11-18: Reduce Risk from TACS at Existing Facilities requires selected	Air District

#	Strategies	Authority
	Bay Area facilities to reduce risk or install best available retrofit control technology for toxics on all significant sources of toxic emissions. Based on the results of the Technical Assessment, the Air District may require Schnitzer Steel and the East Bay Municipal Utility District to adopt a Risk Reduction Plan if the health risk determined by the facility-wide health risk assessment exceeds a risk action level per the requirements of Rule 11-18 implementation.	
65	The Air District intends to provide incentives to replace existing diesel stationary and standby engines (fire pumps, dryers, conveyor belts, cranes) with Tier 4 diesel or cleaner engines. Priority is given to upgrading Tier 0, 1 & 2 engines located closest to schools, senior citizen centers, childcare facilities, and hospitals.	Air District
66	The Air District proposes new regulations to reduce emission sources from autobody and other coating operations, including the use of vanishing oils and rust inhibitors by 2025.	Air District
67	The Air District proposes new regulations to reduce emissions from wastewater treatment plants and anaerobic digestion facilities, such as a regulation to reduce emissions of methane, reactive organic gases, and oxides of nitrogen by 2019.	Air District
68	The Air District proposes a regulation to reduce emissions of reactive organic gases and other toxic compounds from organic liquid storage tanks by 2020.	Air District
69	The Air District advocates for a plan that East Bay Clean Energy and PG&E are spearheading to replace the Dynegy Power Plant with a cleaner and more reliable source of energy by 2022. The proposed location for this initiative is the Oakland C, Oakland L, Maritime Port of Oakland, and Schnitzer Steel substation pocket, which is located within PG&E's Oakland distribution planning area. Eligible resource types include: (1) in-front-of-the-meter renewable generation; (2) in-front-of-the-meter energy storage, and (3) behind-the-meter energy storage. EBCE is seeking to procure the energy, resource adequacy (RA), and renewable energy credits (RECs) associated with these local resources, while PG&E will focus on meeting Oakland's transmission reliability needs.	East Bay Clean Energy, PG&E
	Health Programs	
70	The Air District intends to develop and fund a program to reduce exposure to air pollution at schools, day care facilities, senior centers, health facilities, public facilities, apartments and homes in West Oakland by 2021. This strategy includes policies or grants for building energy efficiency upgrades to reduce infiltration of pollutants and the installation of high-efficiency air filtration systems (rated MERV 14 or higher).	Air District
71	The City of Oakland works with local and agency partners to implement regional and local adoption of the State Department of Public Health's Health In All Policies program.	City of Oakland
72	Consistent with the Oakland Healthy Development Guidelines, the City of Oakland implements a project-wide smoking ban in Oakland at new developments.	City of Oakland
73	Consistent with the State's Building Energy Efficiency Standards for air filtration in effect as of January 1, 2020, the City of Oakland requires newly constructed buildings of four or more habitable floors to include air filtration systems equal to or greater than MERV 13 (ASHRAE Standard 52.2), or a particle size efficiency rating equal to or greater than 50 percent in the 0.3-1.0 µm range and equal to or greater than 85 percent in the 1.0-3.0 µm range (AHRI Standard 680).	City of Oakland
74	The City of Oakland works with agency and community partners to undertake participatory budgeting with West Oakland community members to allocate local health improvement grants that reduce emissions or exposure to emissions.	City of Oakland
75	The Air District researches actions that are potentially exposure-reducing, such as: 1) an engineering evaluation of exhaust stacks and/or vents to determine if relocation will reduce local exposure; (2) a study to determine if smart air filtration systems can reduce exposure by in-taking air during daily non-peak vehicle travel times, such as between midnight and four a.m.; and (3) a study of the potential air quality benefits of a centralized package delivery site such as personal lockers by 2025.	Air District

#	Strategies	Authority
76	The City of Oakland works with local businesses, partner agencies, and community members to develop a Green Business Strategic Plan to attract, retain, and support innovative green companies in West Oakland. This effort includes coordination with State and local agencies to develop criteria for green business certification for new and existing businesses.	City of Oakland
77	The California Office of Environmental Health Hazard Assessment, in partnership with the Steering Committee, the City of Oakland, CARB, and the Air District, studies setting a limit on West Oakland's cumulative exposure to TACs.	OEHHA
78	The City of Oakland works with community partners to implement the Healthy Development Guidelines for new building projects.	City of Oakland
79	The Alameda County Public Health Department expands its Asthma Management programs.	Alameda County Public Health Department
80	The City of Oakland works with Alameda County Public Health to improve access to medical services within West Oakland. This work expands existing programs such as: (1) Child Health and Disability Prevention Program free health check-ups for infants through teens; (2) Asthma Management at schools; (3) Building Blocks for Health Equity which works to correct inequity in health outcomes for children; (4) Urban Male Health Initiative which is charged with reducing the premature mortality of men and boys in Alameda County; and (5) Alameda County Health Improvement Plan to develop and implement a five-year county plan to improve health and achieve health equity.	City of Oakland, Alameda County Public Health Department
81	The Alameda County Public Health Department works with agency and local partners to investigate the use of green building approaches in housing construction and renovation that will reduce emissions and exposure to air pollution emissions. This work examines weatherization/energy efficiency and renewable energy services. This work draws from the Contra Costa County Health Department's pilot effort in cooperation with the Regional Asthma Management Program.	Alameda County Public Health Department
82	CARB conducts a technology assessment of commercial cooking rules and control strategies and proposes incentives and/or a Suggested Control Measure for commercial cooking. The Air District offers incentives and/or proposes a regulation to reduce emissions from commercial cooking.	Air District, CARB
83	The City of Oakland revises standard conditions of approval for conditional use permits for large projects to require "opt-up" to East Bay Community Energy’s Brilliant 100 carbon-free electricity supply.	City of Oakland
84	The Alameda County Transportation Commission will continually engage with the community, at a minimum through participation in quarterly meetings of the WOCAP implementation committee, starting with the early planning and budgeting stages of transportation projects that are being developed by ACTC in West Oakland in order to ensure projects do not increase transportation impacts on residents. These projects will undergo appropriate reviews to assess the environmental and health impacts, and potential local benefits, and adopt associated mitigation measures so they do not result in a net increase in air pollution or health inequities for residents most impacted by the county’s freight transportation system in West Oakland.	ACTC, Caltrans, Air District

2.6.6 EMISSION REDUCTIONS AND COMMUNITY BENEFITS

Guidelines section 15124(b) states the project description may also discuss the project benefits. In addition, Public Resources Code Section 21082.4, AB 2782 (Friedman 2018 CEQA), authorizes lead agencies in describing and evaluating projects in an environmental document, to consider specific economic, legal, social, technological, or other benefits of the project and the negative impacts of denying the Project. Without the implementation of this Community Air Action Plan, the District might be in non-compliance with AB 617 and CARB's Community Air Protection Blueprint, which is the process for meeting statewide strategies to reduce emissions of criteria air pollutants, toxic air contaminants, and develop community emissions reduction programs and/or air monitoring plans.[1] Scientific, government, and academic research provides substantial evidence environmental inequities persist in disadvantaged communities.[2]

Pursuant to AB 617, the Plan will protect and improve community health by striving to eliminate disparities in exposure to local air pollution. This proposed Community Action Plan for the community of West Oakland, further advances the goals and objectives of the District's 2017 Clean Air Plan, *Spare the Air, Cool the Climate*. Both Plans, protect public health, and strengthen efforts to reduce emissions of fine particulate matter (PM) and toxic air contaminants. The implementation of the 84 control strategies is expected to result in overall air pollutant emission reductions and reinforce the District's commitment to protect public health in the most vulnerable communities. Similar to the Air District's 2017 Clean Air Plan, this Community Action Plan can inspire action, as an example of collaboration between numerous stakeholders to implement solutions to improve air quality, protect the climate, and eliminate disparities in exposure to air pollution.

The Steering Committee in partnership with the District developed targets to improve air quality and address exposure disparities. The Plan targets will assist the Steering Committee in determining whether it is on track to meet the Plan's goals. Simultaneously, the Plan will reduce disproportionate air quality impacts between West Oakland and rest of the Bay Area. The Plan has a five-year proposed implementation schedule from 2020 to 2024. The targets can be described as follows:

1. By 2025, throughout West Oakland, all neighborhoods will experience conditions of the ***average*** West Oakland residential neighborhood, as they existed during the base year (2017).

[1] https://ww2.arb.ca.gov/our-work/programs/community-air-protection-program/community-air-protection-blueprint

[2] For example, a study by Morello-Frosch et al., (2016), results revealed California's Cap-and-Trade Program inadequately protects public health and environmental equity goals. https://journals.plos.org/plosmedicine/article?id=10.1371/journal.pmed.1002604. In 2016, the environmental justice community lobbied for the approval of six major environmental justice bills: SB 1000 (Levya 2016) Planning for Healthy Communities Act; AB 2722 (Burke and Arambula 2016) Transformative Climate Communities; SB 32 (Pavley 2016) 2030 Greenhouse Gas Reduction Targets; AB 197 (E. Garcia 2016) Equity & Transparency in Climate Act; AB 1550 (Gomez 2016) Increased Climate Investments; and AB 1937 (Gomez 2016) EJ in Power Plant Siting.

2. By 2030, throughout West Oakland, all neighborhoods will experience conditions of the **least** impacted residential neighborhood during the base year (2017), i.e., the "cleanest" neighborhood in West Oakland.

These targets define the desired future conditions, which are based on the baseline (2017) model year findings. These conditions reflect the impact of local sources, holding aside the regional background. Targets address emissions and exposure from local sources only.

Targets for diesel particulate matter, particulate matter, and cancer risk include the following:

Diesel Particulate Matter (diesel PM) Target

1. By 2025, local emission sources will contribute to the average West Oakland residential neighborhood a concentration of diesel PM of no more than 0.25 ug/m^3 (micrograms per cubic meter).
2. By 2030, local emission sources will contribute to the average West Oakland residential neighborhood a concentration of diesel particulate matter (diesel PM) of no more than 0.12 ug/m^3.

Particulate Matter 2.5 ($PM_{2.5}$) Target

1. By 2025, local emission sources will contribute to the average West Oakland residential neighborhood a concentration of $PM_{2.5}$ of no more than 1.7 ug/m^3.
2. By 2030, local emission sources will contribute to the average West Oakland residential neighborhood a concentration of $PM_{2.5}$ of no more than 1.2 ug/m^3.

Cancer Risk Target

1. By 2025, local emission sources will contribute to the average West Oakland residential neighborhood a cancer risk of no more than 200 in a million.
2. By 2030, local emission sources will contribute to the average West Oakland residential neighborhood a cancer risk of no more than 120 in a million.

One of the benefits of the Plan is to provide financial incentives to reduce air pollutants. A UC Berkeley study (Harley, 2012) found that between 2009 and 2013, the average emission rate from Port diesel trucks declined 76% for black carbon, a major component of diesel PM. The average emission rate for nitrogen oxides, which contribute to the creation of PM and ozone, declined by 53%.[3] Several factors contributed to this decline, including more stringent CARB mobile vehicle emission requirements, changes in practices at the Port of Oakland, and normal "fleet turnover" in the state, as individuals and businesses replaced older, dirtier equipment and vehicles with newer, cleaner equipment and vehicles. Incentive programs played a critical role, too. Since 2009, the Air District has awarded over $39 million in incentive dollars for particulate filters and truck replacements at the Port.

[3] https://www.portofoakland.com/press-releases/press-release-372/ and http://its.berkeley.edu/btl/2012/winter/harley

The Air District also offers incentive dollars to purchase newer and less-polluting equipment and vehicles operating in and around West Oakland. For example, Strategies call for the Air District to commit money to retire or replace older light-duty autos (Strategy #43); replace diesel trucks with zero-emissions trucks (Strategy #44 and #48); upgrade tugs and barges operating at the Port of Oakland (Strategy #45); and upgrade line-haul, passenger, and switcher (yard) locomotives with cleaner engines (Strategy #46).

The Air District has made progress in these areas. See, for example, Table 2.6-2 for a list of projects the Air District has funded to purchase equipment that will assist to further reduce diesel particulate matter and $PM_{2.5}$ in West Oakland air over the next five years.

The Steering Committee will track the progress made towards the implementation of these strategies and targets, and the reduction of local disparities. This proposed project (the Plan) will provide an interdisciplinary, multifaceted approach to bring community groups, government agencies, and public citizens together to work toward reducing environmental disparities and protecting human health.

Table 2.6-2

Air District Funded Projects to Further Reduce Diesel Particulate Matter and $PM_{2.5}$

Project	Grantee Name	Incentive Funds Awarded	Grantee Contribution	Total Project Cost	PM2.5 Emissions Reduced (tpy)
One switcher locomotive	Oakland Global Rail Enterprise	$1,080,500	$1,139,500	$2,220,000	0.040
Two main engines in a tug boat (Sandra Hugh)	Amnav Maritime Corporation	$743,000	$743,656	$ 1,486,656	1.130
Two main engines in a tug boat (Revolution)	Amnav Maritime Corporation	$743,000	$743,656	$ 1,486,656	1.130
Two auxiliary engines in a tug boat (Sandra Hugh)	Amnav Maritime Corporation	$134,000	$16,068	$150,068	0.019
Two auxiliary engines in a tug boat (Revolution)	Amnav Maritime Corporation	$134,000	$16,068	$150,068	0.019
13 hybrid cranes	SSA Terminals	$5,011,500	$885,183	$ 5,896,683	0.166
On-road	Alameda-Contra Costa Transit District	$1,011,000	$5,464,000	$ 6,475,000	0.002
Two main and two auxiliary engines in a Tug boat (Z-3)	Harley Marine Services, Inc. Vessel: Z-Three	$1,613,500	$186,943	$1,800,443	0.364
Two main and two auxiliary engines in a Tug boat (Z-5)	Harley Marine Services, Inc. Vessel Z-Four	$1,613,500	$186,943	$1,800,443	0.364
Two main and two auxiliary engines in a Tug boat	Harley Marine Services, Inc. Vessel Z-Five	$1,613,500	$186,943	$1,800,443	0.364

CHAPTER 3

ENVIRONMENTAL SETTING, IMPACTS, MITIGATION MEASURES, AND CUMULATIVE IMPACTS

This page intentionally left blank.

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 and benefits[1] associated with the Community Action Plan for West Oakland, 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 prepared by the Air District for the Community Action Plan for West Oakland (BAAQMD, 2019) (see Appendix A). The Initial Study concluded that the following resource areas required further environmental impact analyses: Air Quality, Energy (electricity), Greenhouse Gas Emissions, Hazards and Hazardous Materials, and Utilities and Service Systems.[2]

The potential impacts identified in the Initial Study will be evaluated in this EIR. 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 environmental analysis commenced (2019) to the extent that information is available. Where data for 2019 are not available, the data from the year closest to 2019 is used to

[1]AB 2782 CEQA 21082.4.In describing and evaluating a project in an environmental review document prepared pursuant to this division, the lead agency may consider specific economic, legal, social, technological, or other benefits, including regionwide or statewide environmental benefits, of a proposed project and the negative impacts of denying the project. Any benefits or negative impacts considered pursuant to this section shall be based on substantial evidence in light of the whole record.
[2]CEQA Guidelines §15063 (a)(b)(1) Initial Study

define the baseline. 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 West Oakland Community Action Plan as determined in the Notice of Preparation and Initial Study (see Appendix A), and not those environmental resource areas determined to have no potential adverse impact from the proposed project. The Notice of Preparation and Initial Study (see Appendix A) determined that Air Quality, Energy, Greenhouse Gas Emissions, Hazards and Hazardous Materials, and Utilities and Service Systems (solid waste) associated with the proposed project could potentially be significant, either individually or cumulatively and required further detailed analyses in this EIR.

3.1.2 SIGNIFICANCE CRITERIA ((§15064.7 THRESHOLDS OF SIGNIFICANCE)

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 and the Air Districts CEQA Air Quality Guidelines (BAAQMD, 2017a).

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.[3]
>
> **No Impact:** There would be no impact to the identified resource as a result of the project.

[3] CEQA §15149 and AB 2782 CEQA

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 may 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. The potential for any control equipment or other design modifications to affected facilities to have secondary adverse environmental impacts will be evaluated at that time.

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:

1. Avoiding the impact altogether by not taking a certain action or parts of an action.

2. Minimizing impacts by limiting the degree or magnitude of the action and its implementation.

3. Rectifying the impact by repairing, rehabilitating or restoring the impacted environment.

4. Reducing or eliminating the impact over time by preservation and maintenance operations during the life of the action.

5. Compensating for the impact by replacing or providing substitute resources or environments, including through permanent protection of such resources in the form of conservation easements.

In accordance with CEQA statutes (§21081.6), a mitigation and monitoring program would be required to be adopted to demonstrate and monitor compliance with any mitigation measures identified in this EIR. 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 the proposed Strategies that the District may implement under the West Oakland Community Action Plan. The area evaluated for cumulative air impacts in this EIR is the area within West Oakland as identified in Figures 2-2 and 2-3.

3.1.6 OVERVIEW OF ANALYTICAL APPROACH

The West Oakland Community Action Plan is designed to be a comprehensive Plan for the District and other agencies and community groups to use to implement strategies to reduce West Oakland residents' exposure to diesel PM, $PM_{2.5}$, and Toxic Air Contaminant (TAC) emissions. To implement the Plan, the Air District, the West Oakland Environmental Indicators Project and other public agencies propose to draw on a full repertoire of tools and resources. This repertoire includes the District's principal regulatory tool, which is its rulemaking authority granted to it under the California Health & Safety Code to adopt mandatory regulations requiring stationary-source facilities to take action to reduce their air emissions. It also includes the District's grants and incentives programs, which provide monetary incentives for implementing voluntary actions to reduce emissions. And it also includes the District's role in promoting sound policy development and healthy air choices throughout all sectors of our economy and society. This last tool encompasses efforts such as providing technical support to other agencies as they develop and implement their own policies and programs to help achieve clean air; promoting best practices by developing model ordinances, guidance documents and other similar documents; outreach and education efforts to engage with community groups and other organizations; and advocacy in support of legislative and regulatory action at the federal, state and local levels to promote the District's air quality and public health goals.

To facilitate the analysis of the potential impacts from implementation of the strategies in the Community Action Plan, the District has organized the strategies into four categories; (1) stationary-source regulatory actions; (2) grants and incentive actions; (3) technical support, education outreach, and advocacy actions; and (4) strategies to be implemented by other agencies. The following discussion outlines each of these categories in general.

3.1.6.1 Stationary Source Regulatory Action

The principal type of activity that the Air District will engage in under the West Oakland Community Action Plan is to explore, research and/or adopt, if appropriate, mandatory regulations and rules requiring stationary-source facilities to take actions to reduce their air emissions, pursuant to the District's rulemaking authority under the California Health & Safety Code. The enhanced rules and regulations that the Air District proposes to develop under the Community Action Plan will help to reduce emissions in West Oakland. These proposed regulatory measures are evaluated to determine whether they could also result in any significant ancillary adverse environmental impacts.

The West Oakland Community Action Plan proposes a number of Strategies that would reduce emissions of diesel PM, $PM_{2.5}$, and TAC emissions. Potential stationary source strategies include reducing reactive organic gas (ROG) and TAC emissions from modification to existing regulations to further reduce emissions from metal recycling and foundry operations; and installing shore-power or a "bonnet" system on ships that visit the Schnitzer Steel marine terminal. The potential impacts of these types of Strategies are evaluated in Chapter 3 of the EIR as their implementation could result in future physical impacts.

In addition to new and modified rules and regulations, some of the Air District's proposed stationary source regulatory actions will enhance enforcement of existing regulations. These regulatory actions do not require any new or modified equipment at any facilities and as such, they are not expected to result in adverse physical environmental impacts. Strategy #21 which would create a Sustainable Freight Advisory Committee, that could include enhanced enforcement of truck parking and idling, and Strategy #24, which would also result in improved referral and follow-up of nuisance and odor complaints, both fall into this category of no adverse impacts. As this measure would not have any physical environmental impacts, it not addressed in the subsequent environmental analysis. Other similar Strategies include Strategy #2 (technical assistance reviewing and commenting on CEQA documents), Strategy #12 (implement the green infrastructure project currently under development between I-880 and the Prescott neighborhood), Strategy #24 (improved follow-up on nuisance and odor complaints), and Strategy #52 (incentives to purchase electric bikes).

For a number of other proposed stationary source control measures, it is not clear at this point what type of regulatory action (if any) the Air District may take to implement them. For example, several Strategies involve potential rules where further study is needed to determine whether it is possible to obtain additional emissions reductions, and if so, how that would be accomplished. Such measures include Strategy #68 to further control emissions from storage tanks, and Strategy #66 to control emissions from autobody and other coating operations, including vanishing oils and rust inhibitors.

For these types of measures, it is not possible to evaluate with any specificity whether there may be a significant environmental impacts arising from the Air District's implementation actions, as the implementation actions themselves and/or any resulting physical changes to the environment are not yet known with any specificity. In such situations, CEQA does not require a CEQA document to engage in speculation about what might or might not occur from such strategies. CEQA Guidelines Section 15145 provides that "[i]f, after thorough investigation, a lead agency finds that a particular impact is too speculative for evaluation, the agency should note its conclusion and terminate discussion of the impact." Accordingly, speculative implementation strategies of this type are not addressed in detail in the environmental analyses. The Air District has projected what implementation of the Community Action Plan may involve as precisely as is reasonably possible at the current stage of development and, wherever there are specific implementation actions and specific physical changes to the environment that are likely or reasonably possible to occur, they and their environmental impacts are evaluated in detail. But where it is not possible at this stage to project the nature or extent of an implementation action or any resulting environmental impacts beyond mere speculation, they are not evaluated, and indeed cannot be evaluated, in accordance with CEQA Guidelines Section 15145. In addition to the examples cited above, other measures which are considered too speculative to determine if any environmental impacts might occur at this stage include Strategy #3 (evaluate air pollution and health outcomes of allowing truck traffic on I-580 and a truck lane on I-880); as well as some of the measures that would encourage zero emission mobile sources.

3.1.6.2 Grants and Incentives

In addition to the stationary source regulatory measures proposed as part of the Community Action Plan, the Air District is also proposing to use its grants and incentives programs to fund projects in furtherance of the Plan's goals of reducing air pollution and protecting public health. The main vehicles for funding strategies are: the Air District's Transportation Fund for Clean Air (TFCA), which funds cost-effective projects aimed at reducing on-road motor vehicle emissions in the Bay Area, including vehicle replacement projects that fund the replacement of older, higher-emitting vehicles with cleaner zero emission vehicles or partial zero emission vehicles; the Carl Moyer Program; the Mobile Source Incentive Fund; and the Goods Movement Program.

The Air District is proposing to use the grants and incentive program to further the Plan's goals of reducing emissions in West Oakland. These Strategies call for using grant funding to target emissions reductions to be obtained from the transportation section, either by promoting emissions-free alternatives to motor vehicle travel such as walking and bicycling, or by promoting less-polluting vehicular transportation such as zero-emission mobile sources and public transit. In Strategy #43, the Air District would use up to $7 million per year to scrap older vehicles through the Vehicle Buy Back program and, up to $4 million per year through the Clean Cars for All program to replace older vehicles and provide an incentive for a zero emission vehicle or to get a Clipper Card for public transit.

A number of other strategies would also provide financial incentives to reduce emissions including loans for local businesses to install energy storage systems to replace stationary sources of pollution (e.g., back-up generators) (Strategy #14); financial incentives to replace diesel trucks with zero emission trucks (Strategy #44); financial incentives to replace long-haul diesel trucks (Strategy #48); financial incentives to upgrade tugs, barges, and locomotives with cleaner engines (Strategy #45 and #46); financial incentives to support development of hydrogen refueling stations and the purchase of trucks and off-road equipment powered by fuel cells (Strategy #47); financial incentives for the purchase of electric bicycles (Strategy #52); financial incentives to pay for cleaner equipment, e.g., electric lawn and garden equipment, batteries for transportation refrigeration units, and cargo-handling equipment (Strategy #49); and incentives and grants for building energy efficiency upgrades and high efficiency air filtration systems (Strategy #70).

For these types of implementation actions, it is only possible to evaluate the Plan's potential environmental impacts in highly general terms. Strategies #36 and #47 may require construction activities to install electric charging stations, for example, but more information on the location and number of stations is needed to evaluate the magnitude of the impacts. Strategies #45, #46, #48, 49, and #65 could fund the purchase and replacement of older internal combustion engines with newer engines. The disposal of older engines, vehicles, trucks, etc., could have an adverse impact associated with removing hazardous waste (anti-freeze, gasoline, oil) from the vehicles, but more information is needed specifically about how and where such activities would occur before a detailed analysis of potential impacts could be conducted. In addition, if electric vehicles are purchased with the grant funding there could be potential impacts associated with electricity production and supply. However, it is not possible to evaluate whether there could be any environmental impacts from individual projects the Air District might fund, or the nature and extent of any such impacts, as there are no specific projects at this point that have been proposed for grant funding and the availability of the funding, in most cases, is unknown. Given the unspecified nature of the particular activities that the Air District would fund through these strategies, there is no way to evaluate at this point whether there could potentially be any significant environmental impacts associated with them. Therefore, these impacts have been evaluated in a qualitative manner.

CEQA Guidelines §15145, as stated above, provides that "[i]f, after thorough investigation, a lead agency finds that a particular impact is too speculative for evaluation, the agency should note its conclusion and terminate discussion of the impact." That is also the case here with respect to evaluating impacts from some projects that the Air District may fund under the Community Action Plan. It is not possible at this stage to determine – beyond mere speculation – the nature, extent, location, or timing of any activities that may result from projects funded under the Plan and, therefore, it is not possible to evaluate whether any such activities may generate a significant impact. In such situations, CEQA does not contemplate an attempt to assess the significance of purely speculative impacts. Potential environmental impacts will be addressed as the Air District implements the Plan and it becomes clear what specific projects the District may support. When specific projects are proposed, they may be subjected to an applicable CEQA environmental analysis before they can be implemented. At that point, the specific details about the project, including what types of activity will be required and what the potential environmental impacts could be, will be evaluated. The future CEQA analysis will be able to conduct a full analysis of any potential environmental impacts at that time, as the nature, extent, amount of funding, location, timing, and duration of the activity will be known. For these reasons, the impacts analysis in Chapter 3 does not evaluate potential impacts from any projects that the Air District may fund through its grants and incentives programs, where the impacts are speculative.

3.1.6.3 Technical Support, Educational Outreach and Advocacy

The third category of actions the Air District is proposing in the West Oakland Community Action Plan involves measures to promote sound policy development and healthy air quality choices throughout all sector of the economy and society. These activities include promoting best practices by public agencies and other entities through information resources, model ordinances, guidance documents, etc.; outreach and education to engage with community groups and other organizations; and advocacy in support of legislative and regulatory action at the federal and state levels in order to promote the District's air quality and public health goals.

The Air District's technical support, educational and advocacy efforts are aimed at supporting and encouraging other agencies, organizations, businesses and individuals as they take action to address air pollution and climate change concerns in areas outside of the Air District's direct regulatory authority. The District regularly participates with such entities to support them in developing plans, policies and programs that are aligned with the Air District's clean air goals. The Air District has partnered and participated in multiple collaborative policy and planning efforts, such as: (1) *Plan Bay Area* in conjunction with the Metropolitan Transportation Commission (MTC) and the Association of Bay Area Governments (ABAG); (2) CARB's *2016 Mobile Source Strategy*; (3) MTC's regional *Goods Movement Plan*; and (4) the *Bay Area Goods Movement Collaborative* convened by MTC and the Alameda County Transportation Commission.

Portions of the West Oakland Community Action Plan would continue and expand technical support, educational and advocacy efforts. For example, Strategy #2 continues the District's engagement in the environmental review process for development projects in West Oakland, providing data and technical assistance to lead agencies. The Air District provides this support through resources it has developed through its CEQA Guidelines document, and its *Planning Healthy Places* guidance document, among others. The Community Action Plan calls on the Air District to continue and enhance these efforts in West Oakland going forward.

The Air District also focuses advocacy efforts on supporting legislative and regulatory initiatives to promote clean air and climate protection. The West Oakland Community Action Plan includes actions for the Air District to seek authority to reduce emissions and risk from magnet sources such as freight operations and warehouse distribution centers.

Finally, the Air District also engages in education and outreach efforts aimed at encouraging members of the public to generally make positive lifestyle choices to help improve air quality. For example, the Air District's existing "Spare the Air Every Day" Program encourages members of the public to reduce motor vehicle travel and other pollutant-emitting activities, when high ozone levels are predicted. The proposed West Oakland Community Action Plan incorporates education and outreach efforts through strategies that would provide education on measures that could reduce the use of energy and lead to more energy efficient buildings.

These technical support, education and advocacy efforts are not expected to result in any significant environmental impacts. Providing policy input by participating in the development of other agencies' plans and initiatives in those agencies' own regulatory areas, as the District has done with CARB's *Mobile Source Strategy* and MTC's *Goods Movement Plan*, does not involve any activities that could generate environmental impacts. Nor does providing technical support for implementing such plans and initiatives once they are adopted, for example identifying best practices to mitigate air quality impacts from infill development. And the same is true for other educational outreach and advocacy efforts the Air District will engage in under the proposed Plan, such as continuing to review and comment on CEQA documents, and providing educational programs to promote informed lifestyle choices related to clean air.

To the extent that the Air District's technical support, educational and advocacy efforts are aimed at promoting sound policy choices by other governmental agencies and private individuals, it is not possible to assess with any level of specificity how the District's efforts would result in specific actions by such third-parties that would result in physical changes to the environment. The Air District obviously hopes that its efforts will help influence positive outcomes. But it is not possible to predict beyond speculation what actions any other agency or private individual may take or not take as a result of the District's efforts, compared to what would occur absent any District action. As a result, it is not possible to assess whether there would be any physical changes to the environment that might occur as a result of the District's efforts under the Plan, let alone the extent of any potential adverse impacts associated with any such changes. Accordingly, under CEQA Guidelines Section 15145, such speculative impacts from the District's technical support, educational and advocacy efforts are not evaluated in Chapter 3.

3.1.6.4 Actions by Other Agencies

Finally, to be comprehensive, the West Oakland Community Action Plan also includes Strategies proposed to be implemented primarily or exclusively by other agencies, such as the City of Oakland and CARB. The major portion of the Strategies would be implemented by agencies other than the Air District.

The West Oakland Community Action Plan includes these control measures because they involve activities by other agencies in the region that further the same clean air goals for West Oakland that the Air District, and other agencies and organizations, are seeking to achieve under the Plan. Including them in the Plan serves to provide a comprehensive picture of all such activities throughout the region. These activities by other agencies are included for information purposes only, however. They are not dependent on approval of the Strategies that are under the authority of the Air District. Further, the Air District's approval of the Strategies will not authorize or commit those agencies to any action. As these actions and activities by independent agencies are not Air District actions and will occur independently of the District's approval of the Strategies under their authority, they are not direct or indirect effects resulting from approval of the Plan that must be analyzed in this document. Accordingly, Chapter 3 does not address implementation actions by other agencies that are independent of the Air District's implementation actions under the Community Action Plan.

CHAPTER 3.2

AIR QUALITY IMPACTS

This page intentionally left blank.

3.2 AIR QUALITY

This subchapter of the EIR evaluates the potential air quality impacts associated with implementation of the West Oakland Community Plan, which aims to reduce residents' exposure to diesel PM, fine particulate matter, and TACs.

As discussed in the Initial Study, in accordance with AB 617, the Community Action Plan was developed through monthly meetings with the West Oakland Steering Committee and provides strategies to reduce exposure to air pollution and related health effects in West Oakland. Certain Strategies have the potential to increase emissions of other pollutants, such as GHGs and criteria pollutants. Adverse impacts include increased emissions associated with construction activities and combustion sources from certain types of air pollution control equipment. The Notice of Preparation and Initial Study (see Appendix A) determined that air quality impacts of the proposed project are potentially significant. Project-specific and cumulative adverse air quality impacts associated with the proposed rule amendments have been evaluated in Chapter 3.2.4 through 3.2.6 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 (PM_{10} and $PM_{2.5}$), 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, annual $PM_{2.5}$ specifically for 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

AIR POLLUTANT	STATE STANDARD CONCENTRATION/ AVERAGING TIME	FEDERAL PRIMARY STANDARD CONCENTRATION/ AVERAGING TIME	MOST RELEVANT EFFECTS
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 (PM_{10})	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 ($PM_{2.5}$)	12 µg/m^3, annual arithmetic mean> No State 24-hr Standard	12.0 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 Districts 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 with over 30 monitoring stations within the San Francisco Bay Area. A summary of the most recent monitoring data in the Bay Area (2017) 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 – 2017

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 1-Hr Days	Cal 1-Hr Days	Max 1-Hr	Max 24-Hr	Nat 1-Hr Days	Cal 24-Hr Days	Ann Avg	Max 24-Hr	Nat 24-Hr Days	Cal 24-Hr 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	98	1	84	2	2	63	5.6	4.7	0	53	7	0	0	-	-	-	-	-	-	-	-	199.1	13	35	13.7	10.9
San Rafael	88	0	63	0	0	58	2.6	1.6	0	53	10	0	0	-	-	-	-	17.7	94	0	2	74.7	8	27	9.7	8.2
Sebastopol	87	0	71	1	1	53	2.1	1.6	0	35	5	0	0	-	-	-	-	-	-	-	-	81.8	4	21	8.1	6.5
Vallejo	105	1	88	2	2	61	3.1	2.1	0	49	8	0	0	5.9	2.17	0	0	-	-	-	-	101.9	9	30	11.6	9.5
Coast/Central Bay																										
Berkeley Aquatic Pk*	58	0	49	0	0	*	2.2	1.7	0	123	16	1	0	-	-	-	-	-	-	-	-	52.0	7	*	9.1	*
Laney College Fwy	-	-	-	-	-	-	1.9	1.3	0	68	17	0	0	-	-	-	-	-	-	-	-	70.8	8	27	11.6	10.1
Oakland	136	2	100	2	2	54	3.2	2.2	0	65	10	0	0	-	-	-	-	-	-	-	-	70.2	7	24	9.4	7.9
Oakland-West	87	0	68	0	0	48	6.0	2.1	0	52	13	0	0	16.9	2.2	0	0	-	-	-	-	56.0	7	28	12.8	10.6
Richmond	-	-	-	-	-	-	-	-	-	-	-	-		16.0	2.9	0	0	-	-	-	-	-	-	-	-	-
San Francisco	87	0	54	0	0	47	2.5	1.4	0	73	11	0	0	-	-	-	-	22.0	77	0	2	49.9	7	27	9.7	8.3
San Pablo	104	3	80	2	2	52	2.5	1.9	0	48	8	0	0	8.3	2.7	0	0	20.3	95	0	4	71.2	9	30	10.8	9.3
Eastern District																										
Bethel Island	90	0	71	1	2	68	1.6	1.0	0	34	5	0	0	5.3	3.5	0	0	16.3	52	0	1	-	-	-	-	-
Concord	82	0	70	0	0	66	1.7	1.3	0	41	7	0	0	13.2	2.6	0	0	13.3	41	0	0	89.4	6	26	12.0	8.9
Crockett	-	-	-	-	-	-	-	-	-	-	-	-	-	23.5	5.6	0	0	-	-	-	-	-	-	-	-	-
Fairfield	80	0	62	0	0	63	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Livermore	109	5	86	6	6	75	-	-	-	45	9	0	0	-	-	-	-	-	-	-	-	41.5	2	25	8.5	8.2
Martinez	-	-	-	-	-	-	-	-	-	-	-	-	-	15.9	3.1	0	0	-	-	-	-	-	-	-	-	-
San Ramon	92	0	75	2	2	68	-	-	-	31	5	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-
South Central Bay																										
Hayward	139	2	110	3	4	65	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Redwood City	115	2	86	2	2	56	2.8	1.4	0	67	11	0	0	-	-	-	-	-	-	-	-	60.8	6	23	9.1	7.7
Santa Clara Valley																										
Gilroy	96	1	84	1	1	64	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	48.4	2	18	75.5	6.1
Los Gatos	93	0	75	3	3	66	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
San Jose	121	3	98	4	4	67	2.1	1.8	0	68	12	0	0	3.6	1.1	0	0	21.6	70	0	6	49.7	6	27	9.5	9.3
San Jose Freeway	-	-	-	-	-	-	2.6	1.8	0	77	17	0	0	-	-	-	-	-	-	-	-	48.4	8	28	10.8	9.5
San Martin	96	1	86	3	3	69	-	-	-	-	-	-		-	-	-	-	-	-	-	-	-	-	-	-	-
Total Days over Standard		**6**		**6**	**6**				**0**			**1**	**0**			**0**	**0**			**0**	**6**		**18**			

Source: BAAQMD, 2018.
*Near-road air monitoring at Berkeley Aquatic Park began on July 1,2016. Therefore, 3-year average statistics for ozone and $PM_{2.5}$ are not available.
(ppb) = parts per billion (ppm) = parts per million, (µg/m³) = micrograms per cubic meter
.

The 2017 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 State or federal AAQS for CO and SO_2. There was one exceedance of the federal NO_2 AAQS at one monitoring station in 2017, although the area did not violate the NAAQS. All monitoring stations were in compliance with the federal PM_{10} standards. The State 24-hour PM_{10} standard was exceeded on six days in 2017, 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 $PM_{2.5}$ standard. The state and federal 8-hour ozone standards were exceeded on 6 days in 2017 at one site or more in the Air District; most frequently in the Eastern District (Livermore, Patterson Pass, and San Ramon) and the Santa Clara Valley (see Table 3.2-2). The federal 24-hour $PM_{2.5}$ standard was exceeded at one or more Bay Area station on 18 days in 2017, most frequently in the Napa, San Rafael, Vallejo, and San Pablo.

The air quality data for West Oakland shows that the area is in compliance with the state and federal standards for ozone, carbon monoxide, nitrogen dioxide, sulfur dioxide, and PM10. The West Oakland area exceeded the $PM_{2.5}$ federal 24-hour standard on seven days in 2017. However, the 24-hour design value was attained; therefore, in compliance with both $PM_{2.5}$ NAAQS.

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 PM_{10} standard, annual PM_{10} standard, and annual $PM_{2.5}$ standard. The Air District is unclassifiable/attainment for the federal CO, NO_2, SO_2, Pb, and PM_{10} 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 NAAQS.

TABLE 3.2-3

Bay Area Air Quality Summary
Days over Standards

YEAR	OZONE			CARBON MONOXIDE				NOx		SULFUR DIOXIDE		PM_{10}		$PM_{2.5}$
	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
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	0	0	0	0	0	1	9
2016	15	6	15	0	0	0	0	0	0	0	0	0	0	0
2017	6	6	6	0	0	0	0	1	0	0	0	0	6	18

Source: BAAQMD, 2018

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 reactive organic gases (ROG), 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 Reactive Organic Gases (ROGs)

It should be noted that there are no state or national ambient air quality standards for ROGs because they are not classified as criteria pollutants. ROGs are regulated, however, because ROG emissions contribute to the formation of ozone. They are also transformed into organic aerosols in the atmosphere, contributing to higher $PM_{2.5}$, $PM_{10,}$ and lower visibility levels.

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

ROG emissions result primarily from incomplete fuel combustion and the evaporation of paints, solvents and fuels. Mobile sources are the largest contributors to ROG emissions. Stationary sources include processes that use solvents (such as manufacturing, degreasing, and coating operations) and petroleum refining, and marketing. Area-wide ROG 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 (PM_{10} & $PM_{2.5}$)

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, PM_{10} and $PM_{2.5}$. 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 PM_{10} and $PM_{2.5}$.

A consistent correlation between elevated ambient particulate matter (PM_{10} and $PM_{2.5}$) 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 ($PM_{2.5}$) 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 PM_{10} and $PM_{2.5}$.

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 PM_{10}.

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 PM_{10} and $PM_{2.5}$. 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.

3.2.1.3.1 Ozone

NOx and ROG emissions are decreasing state-wide and in the San Francisco Bay Area since 1975 and are projected to continue to decline. ROG emissions result primarily from incomplete fuel combustion and the evaporation of paints, solvents and fuels. Mobile sources are the largest contributors to ROG emissions. Stationary sources include processes that use solvents (such as manufacturing, degreasing, and coating operations) and petroleum refining and marketing. Area-wide ROG 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 (see Table 3.2-4) (BAAQMD, 2017).

TABLE 3.2-4

Anthropogenic Air Emission Inventory 2015
(tons per day)

Source	ROG	NOx
On-Road Motor Vehicles	59.6	128.1
Other Mobile Sources	49.2	122.2
Petroleum & Solvent Evaporation	67.3	--
Industrial and Commercial	15.4	3.0
Combustion	13.0	44.7
Other Sources	54.4	1.2

Source: BAAQMD, 2017

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 ROG emissions have been reduced for both stationary and mobile sources due to more stringent regulations from CARB and the District, respectively (see Table 3.2-4) (BAAQMD, 2017).

3.2.1.3.2 Particulate Matter

Particulate matter (both PM_{10} and $PM_{2.5}$) 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 ($PM_{2.5}$) consists of particles 2.5 microns or less in diameter. PM_{10} 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 $PM_{2.5}$ (BAAQMD, 2017). Biomass combustion concentrations are about 3-4 times higher in winter than during the other seasons, and its contribution to peak $PM_{2.5}$ is greater. The increased winter biomass combustion sources reflect increased residential wood-burning during the winter season. The inventory of PM_{10} and $PM_{2.5}$ emission sources is provided in Table 3.2-5.

TABLE 3.2-5

Particulate Emissions Inventory by Source, Annual Average 2015 (tons per day)

Source	PM_{10}	$PM_{2.5}$
Residential Wood-Burning	12.0	11.8
Geological Dust	49.1	6.6
On-Road Motor Vehicles	12.0	5.6
Other Mobile Sources	5.5	5.6
Industrial Combustion	6.5	6.1
Industrial/Commercial Processes	7.6	4.7
Accidental Fires	4.4	3.8
Commercial Cooking	2.2	1.9
Animal Waste	9.8	0.9

Source: BAAQMD, 2017

3.2.1.4 Non-Criteria Pollutants Health Effects

Although the primary mandate of the Air District is attaining and maintaining the national and state Ambient Air Quality Standards for criteria pollutants within the Air District jurisdiction, the Air District also has a general responsibility to control, and where possible, reduce public exposure to airborne toxic compounds. TACs are a set of airborne pollutants defined by the state of California that may pose a present or potential hazard to human health. A wide range of sources from industrial plants to motor vehicles emit TACs, like $PM_{2.5}$. 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.

1. 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. Common stationary sources in this category include gasoline stations, dry cleaners, and diesel backup generators, among others.

2. 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.

3. The District’s Community Air Risk Evaluation (CARE) Program has been implemented to identify areas where air pollution contributes most to health impacts and where populations are most vulnerable to air pollution; to reduce the health impacts in these areas; and to engage the community and other agencies to develop additional actions to reduce local health impacts.

4. 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.

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

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

7. The District’s Regulation 11, Rule 18: Reduction from Air Toxic Emissions at Existing Facilities which was adopted November 15, 2017. This rule requires the

District to conduct screening analyses for facilities that report TAC emissions within the District and calculate health prioritization scores based on the amount of TAC emissions, the toxicity of the TAC pollutants, and the proximity of the facilities to local communities. The District will conduct health risk assessments (HRAs) for facilities that have priority scores above a certain level. Based on the health risk assessment, facilities found to have a potential health risk above the risk action level would be required to reduce their risk below the action level, or install Best Available Retrofit Control Technology for Toxics on all significant sources of toxic emissions.

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 or DPM) 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.

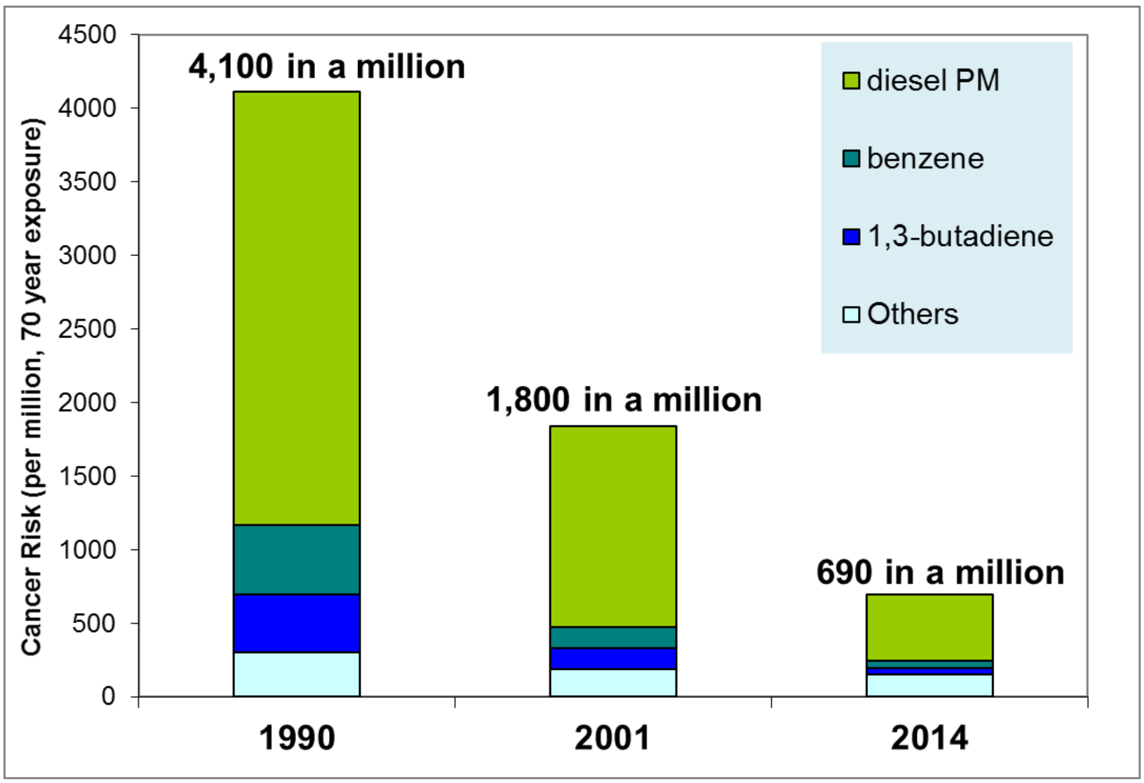
Acetaldehyde and formaldehyde are emitted from fuel combustion and other sources. They are also formed photo-chemically in the atmosphere from other compounds. Both compounds have been found to cause nasal cancers in animal studies and are also associated with skin and respiratory irritation. Human studies 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,[4] 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, 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

---

[4] 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.

3.2.1.4.2 Air Toxics Emission Inventory

The Air District 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 Air District 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 3.2-6 contains a summary of average ambient concentrations of TACs measured at monitoring stations in the Bay Area by the District in 2017.

TABLE 3.2-6

Summary of 2017 Air District Ambient Air Toxics Monitoring Data

Compound	Max. Conc. (ppb) (1)	Min. Conc. (ppb) (2)	Mean Conc. (ppb) (3)
1,3-Butadiene	0.541	0.000	0.012
Acetaldehyde	5.680	0.480	1.982
Acetone	29.901	0.345	4.072
Acetonitrile	3.799	0.000	0.088
Acyrlonitrile	0.323	0.000	0.001
Benzene	3.123	0.000	0.221
Carbon Tetrachloride	0.130	0.024	0.098
Chloroform	0.115	0.000	0.023
Dichloromethane	1.791	0.000	0.159
Ethyl Alcohol	91.740	0.236	5.455
Ethylbenzene	1.136	0.000	0.138
Ethylene Dibromide	0.000	0.000	0.000
Ethylene Dichloride	0.000	0.000	0.000
Formaldehyde	7.290	0.480	2.707
Freon-113	0.205	0.051	0.070
Methyl Chloroform	1.226	0.000	0.006
Methyl Ethyl Ketone	5.743	0.000	0.259
Tetrachloroethylene	0.337	0.000	0.003
Toluene	3.925	0.000	0.503
Trichloroethylene	0.328	0.000	0.001
Trichlorofluoromethane	0.593	0.194	0.248
Vinyl Chloride	0.000	0.000	0.000
m/p-Xylene	2.929	0.000	0.236
o-Xylene	1.446	0.000	0.108

Source: BAAQMD, 2018a

NOTES: Table 3.2-6 summarizes the results of the Air District gaseous toxic air contaminant monitoring network for the year 2017. These data represent monitoring results at 21 separate sites at which samples were collected.

(1) "Maximum Conc." is the highest daily concentration measured at any of the 21 monitoring sites.

(2) "Minimum Conc." is the lowest daily concentration measured at any of the 21 monitoring sites.

(3) "Mean Conc." is the arithmetic average of the air samples collected in 2017 at the 21 monitoring sites.

(4) Acetaldehyde and formaldehyde concentrations reflect measurements from one monitoring site (San Jose-Jackson).

3.2.1.4 Sensitive Receptors, Community-Scale Emissions Inventory, and Health Risks in West Oakland

Located in the urban core of the San Francisco Bay Area, West Oakland is bounded by Interstate 880 (I-880) to the south and west, Interstates 80 (I-80) and 580 (I-580) to the north, and Interstate 980 (I-980) to the east. The Port of Oakland and associated rail yards and rail lines lie to the south and west. The West Oakland Community Action Plan (Plan) area includes the Port of Oakland and is bounded by the Oakland Alameda Estuary to the south, the San Francisco Bay to the west, I-80 and I-580 to the north, and I-980 to the east (see Figures 2-1 and 2-2).

In West Oakland, people work, live, and play in proximity to the Port, the former Oakland Army Base (currently under redevelopment), regional infrastructure such as the Post Office, freeways, BART tracks, and other industrial uses including maritime-freight industry operations, large distribution centers, a concrete batch plant, a peaker power plant, and metal and recycling facilities. West Oakland has numerous sensitive receptors: schools, playground, senior facility, and residences (BAAQMD, 2018). Figure 3.2-2 identifies the location of sensitive receptors in West Oakland.

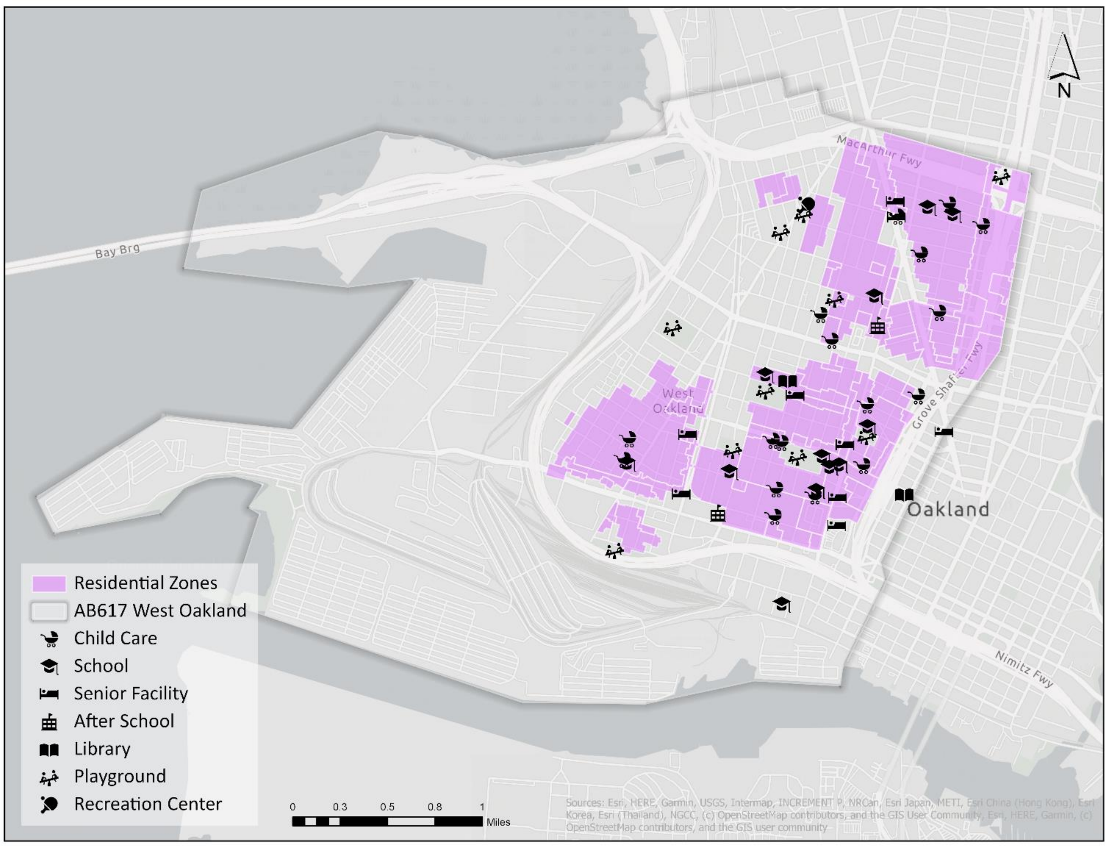


Figure 3.2-2: Sensitive Receptors in West Oakland

Infrastructure and industrial uses contribute to West Oakland's elevated levels of diesel particulate matter (DPM), fine particulate matter ($PM_{2.5}$), and TACs. Because of high levels of local pollution exposure and poor health conditions, the Air District identified West Oakland as an impacted community in the Community Air Risk Evaluation Program (CARE).[5] Similarly, the State of California, using the CalEnviroScreen screening tool, recognizes that across a wide array of environmental and health indicators that includes air, water, and soil pollution, West Oakland is one of the most impacted areas in the state. All West Oakland census tracts are in the top 50% of pollution-burdened census tracts, and approximately half of West Oakland's census tracts are in the top 90% of pollution-burdened census tracts in the State. While CalEnviroScreen is not intended to be used for CEQA purposes, CalEnvironScreen was used by CARB as one criterion for identifying disadvantaged communities under AB 617.

The Air District developed a "community-scale" emissions inventory for $PM_{2.5}$, DPM, and other air toxics from sources within West Oakland for 2017. This emissions inventory was developed using a bottom-up approach, where detailed activity data and emission factors are used to estimate total emissions. The District estimated that over 86 tons of $PM_{2.5}$ and 25 tons of DPM were emitted by local sources in West Oakland in 2017 (see Table 3.2-7).

However, there are several emission sources in West Oakland that were not accounted for in the community-scale emissions inventory, namely due to insufficient understanding of the spatial and temporal variability of these emissions (e.g., residential wood combustion, construction activities, etc.). Emissions from these sources were estimated using a top-down approach (based on regional inventories and spatial surrogates) but were not included in further dispersion modeling and risk assessment. The grand total emissions in West Oakland can be estimated by summing the results from the bottom-up emissions inventory and the top-down emissions inventory; ~66% of total $PM_{2.5}$ emissions (129.72 tons per year), and ~86% of total DPM emissions (29.61 tons per year) were accounted for in the community-scale emissions inventory (see Table 3.2-7).

The Air District used the American Meteorological Society/EPA Regulatory Model Improvement Committee Regulatory Model (AERMOD) to simulate dispersion from each emissions source in the community-scale emissions inventory, using source-specific temporal and spatial allocation data. Concentrations were sampled at receptors within the West Oakland community. The concentrations of DPM and other air toxics were then used to estimate cancer risk (see Table 3.2-8).

[5] Air District Community Air Risk Evaluation Program, April 2014

TABLE 3.2-7

West Oakland Emission Inventory

Source	2017 Emissions		
	Tons/year		Cancer Risk-Weighted
	$PM_{2.5}$	DPM	
West Oakland Sources Included in Community-Scale Modeling			
Highway	**20.28**	**2.12**	**1,789.82**
Non-truck vehicles	12.22	0.19	330.38
HD/Medium HD trucks	2.48	1.84	1,390.72
Light HD trucks	0.41	0.09	68.72
Road dust	5.17	--	--
Street	**22.34**	**2.06**	**1,687.33**
Non-truck vehicles	4.82	0.09	182.48
HD/Medium HD trucks	2.43	1.88	1,429.46
Light HD trucks	0.35	0.09	75.38
Road dust	14.74	--	--
Port	**22.46**	**17.45**	**13,009.80**
OGV maneuvering	3.94	3.84	2,858.72
OGV berthing	8.59	6.20	4,614.78
Harbor craft	3.64	3.75	2,791.10
Dredging	1.12	1.16	863.85
Bunkering	0.16	0.17	126.73
Port trucks*	0.93	0.50	385.32
Road dust	2.25	--	--
Cargo handling	1.59	1.58	1,176.63
OGRE Railyard	0.07	0.08	57.34
BNSF Railyard	0.17	0.18	135.54
Rail	**2.04**	**2.20**	**1,636.64**
Rail lines	1.02	1.09	810.18
UP Railyard	1.02	1.11	826.46
Permitted	**17.84**	**0.30**	**1,101.14**
Schnitzer (stationary)	5.20	0.00	822.78
EBMUD	3.99	0.09	110.19
Dynegy	1.96	0.00	0.64
Pinnacle Ag Services	1.48	0.00	0.00
Sierra Pacific	0.91	0.00	0.00
CASS	0.72	0.00	0.01
California Cereal	0.58	0.00	0.00
CA Waste (10th St)	0.46	0.00	0.00
Other	2.53	0.21	167.52

TABLE 3.2-7 (cont.)

Source	2017 Emissions		
	Tons/year		Cancer Risk-Weighted
	$PM_{2.5}$	DPM	
Other	**1.36**	**1.36**	**1,015.74**
Ferries	0.91	0.93	695.22
Schnitzer (ships)	0.30	0.30	225.23
Schnitzer (trucks)	0.04	0.01	8.32
Truck-related businesses	0.11	0.12	86.98
Total West Oakland Sources Included in Community-Scale Modeling	**86.32**	**25.49**	**20,240.47**
West Oakland Sources Not Included in Community-Scale Modeling			
Area	**30.40**	**0.00**	**413.15**
Commercial cooking	20.63	0.00	8.83
Food and agriculture	0.00	0.00	13.33
Residential fuel combustion	6.93	0.00	17.79
Commercial/industrial fuel combustion	2.30	0.00	17.29
Industrial processes	0.03	0.00	175.79
Solvent utilization	0.00	0.00	125.48
Consumer products	0.00	0.00	41.40
Other area sources	0.50	0.00	13.25
Non-Road	**13.00**	**4.12**	**3,358.05**
Construction equipment	4.10	3.33	2,500.95
Construction dust	6.74	--	--
Commercial/industrial equipment	1.17	0.51	436.11
Lawn & garden equipment	0.12	0.02	78.65
Transportation refrigeration units (TRUs)	0.24	0.26	191.84
Other non-road sources	0.63	0.00	150.50
Total West Oakland Sources Not Included in Community-Scale Modeling	**43.40**	**4.12**	**3,771.20**
GRAND TOTAL:	**129.72**	**29.61**	**24,011.67**

The "Port truck" sub-category includes all drayage truck emissions, including operations on highways and surface streets.

The cancer risk associated with the sources within West Oakland only has also been estimated by the District (see Table 3.2-8). The total estimated residential cancer risk from local sources in West Oakland is 204 per million. Based on the emissions modeling the primary local sources of emissions that contribute to the residential cancer risk in West Oakland are trucks (39%), marine vessels (31%), and rail (17%). The emissions data in Table 3.2-8 are from local emissions within West Oakland (only).

TABLE 3.2-8

Annual Average Modeled Impact of Local Sources on Residential Cancer Risk in West Oakland

Source	30-Year Residential Cancer Risk (per million)	Percent of Total Risk
Highway Sources		
Heavy/Medium Duty Trucks	32.2	16%
Non-truck vehicles	7.3	4%
Light Trucks	1.6	1%
Street Sources		
Heavy/Medium Trucks	39.3	19%
Non-Truck Vehicles	7.5	4%
Light Trucks	1.9	1%
Port Sources		
Harbor Craft	24.3	12%
Ocean-Going Vessel (at berth)	16.5	8%
Ocean-Going Vessel (maneuvering)	10.5	5%
Dredging	6.1	3%
Drayage Trucks	4.6	2%
Cargo Handling Equipment	3.4	2%
Railyard (OGRE)	2.2	1%
Railyard (BNSF)	1.6	1%
Bunkering (tugs & pumps)	1.0	0%
Non-Truck Vehicles	0.1	0%
Rail		
Railyard (UP)	15.5	8%
Rail Lines	14.9	7%
Permitted Sources		
Schnitzer (stationary sources)	4.1	2%
Other facilities	2.2	1%
EBMUD	1.6	1%
Other Sources		
Ferries	3.7	2%
Schnitzer (ships)	1.3	1%
Truck-related businesses	0.7	0%
Schnitzer (trucks)	0.1	0%
TOTAL:	204.2	100%

Source: West Oakland Community Action Plan, Bay Area Air Quality Management District, June 2019.

3.2.2 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 ozone, CO, NO_2, SO_2, PM_{10}, $PM_{2.5}$, 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, as well as the New Source Performance Standards (NSPS), both of which regulate stationary sources under specified conditions.

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 is responsible for developing and implementing air pollution control plans to achieve and maintain state and federal ambient air quality standards. CARB has primary responsibility for statewide pollution sources and produces a major part of the State Implementation Program (SIP). 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 (AB 2595) 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.

Assembly Bill (AB) 617 (C. Garcia, Chapter 136, Statutes of 2017) requires the adoption and implementation of community emissions reduction plans for targeted jurisdictions with disproportionate impacts from air pollution. Pursuant to AB 617, the Air District and the West Oakland Environmental Indicators Project jointly developed a community emissions reduction plan, referred to as the Community Action Plan, for West Oakland. The proposed plan includes strategies at the community level to maximize emission reductions and reduce residents' cumulative exposure to criteria air pollutants and toxic air contaminants. The West Oakland Community Action Plan is an integrated multi-pollutant community air quality plan to eliminate health risk disparities in West Oakland. This Community Action Plan also documents the Steering Committee's effort to study air pollution in West Oakland, and to identify and to prioritize Action Strategies that once implemented, will significantly reduce West Oakland's air pollution burden.

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:

1. Requiring the use of specific emission control strategies or equipment (e.g., the use of floating roof tanks for ROG emissions);
2. Requiring that emissions generated by a source be controlled by at least a specified percentage (e.g., 95 percent control of ROG emissions from pressure relief devices);
3. Requiring that emissions from a source not exceed specific concentration levels (e.g., 100 parts per million (ppm) by volume of ROG 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);
4. Requiring that emissions not exceed certain quantities for a given amount of material processed or fuel used at a source (e.g., 0.033 pounds NOx per million BTU of heat input, on a refinery-wide basis, for boilers, process heaters, and steam generators);
5. Requiring that emissions be controlled sufficient to not result in off property air concentrations above specified levels (e.g., 0.03 ppm by volume of hydrogen sulfide (H_2S) in the ambient air);
6. Requiring that emissions from a source not exceed specified opacity levels based on visible emissions observations (e.g., no more than 3 minutes in any hour in which emissions are as dark or darker than No. 1 on the Ringelmann chart);
7. Requiring that emissions be minimized by the use of all feasible prevention measures (e.g., flaring prohibited unless it is in accordance with an approved Flare Minimization Plan);
8. Requiring that emissions of non-methane organic compounds and methane from the waste decomposition process at solid waste disposal sites be limited;
9. Requiring emission limits on ozone precursor organic compounds from valves and flanges; and
10. Requiring the limitation of emissions of organic compounds from gasoline dispensing facilities.

3.2.2.2 Toxic Air Contaminants

3.2.2.2.1 Federal and State Regulations

TACs are regulated in the District through federal, state, and local programs. At the federal level, air toxics 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 required the U.S. EPA to promulgate NESHAPs on a specified schedule for certain categories of sources identified by the U.S. EPA as emitting one or more of the 189 listed HAPs. Emission standards for affected 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 promulgated by May 2015.

Many sources of HAPs that have been identified under the CAA are also subject to the California TAC regulatory programs. CARB developed four 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) (1987 Connelly) , as amended by Senate Bill (SB) 1731 (1982 Calderon), establishes 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. AB 2588 requires operators of certain stationary sources to inventory air toxic emissions from their operation and, if directed to do so by the local air district, prepare a health risk assessment to determine the potential health impacts of such emissions. If the health impacts are determined to be “significant” (greater than 10 per million exposures or non-cancer chronic or acute hazard index greater than 1.0), each facility must, upon approval of the health risk assessment, provide public notification to affect individuals.

Community Air Protection Program (AB 617): The Community Air Protection Program was established under AB 617 (2017 Garcia) to reduce exposure in communities most impacted by air pollution. The Program includes community air monitoring and community emissions reduction programs, as well as funding to support early actions to address localized air pollution through targeted incentive funding to deploy cleaner technologies in these impacted communities. AB 617 also includes new requirements for accelerated retrofit of pollution controls on industrial sources, increased penalty fees, and greater transparency and availability of air quality and emissions data, which will help advance air pollution control efforts. CARB is required to select the communities for action in the first year of the program and develop the program requirements by October 2018. The 2018 communities in the Bay Area recommended by CARB staff for approval by the CARB Governing Board are Richmond and West Oakland.

3.2.2.2.2 District TAC Rules and Regulations

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. 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.

District Rules and Regulations: The Air District has a number of rules that reduce or control emissions from stationary sources. A number of regulations that control criteria pollutant emissions also control TAC emissions. For example, inspection and maintenance programs for fugitive emission sources (e.g., pumps, valves, and flanges) control ROG emissions, some of which may also be TAC emissions. Also, as discussed above, the District's Regulation 11, Rule 18: Reduction from Air Toxic Emissions at Existing Facilities requires a review of TAC emissions, health risk assessments for facilities that have priority scores above a certain level, and risk reduction measures or installation of Best Available Retrofit Control Technology for Toxics on all significant sources of toxic emissions, if certain health risks are exceeded.

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.

Air Toxics Hot Spots Program: The Air Toxic Hot Spots program, or AB 2588 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.

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 3.2-9 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 3.2-9

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

Targeted Control of TACs Under the Community Air Risk Evaluation Program: In 2004, the Air District established the CARE program to identify locations with high emissions of TAC and high exposures of sensitive populations to TAC and to use this information to help establish policies to guide mitigation strategies that obtain the greatest health benefit from TAC emission reductions. For example, the Air District will use 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.

The CARE program was initiated to evaluate and reduce health risks associated with exposures to outdoor TACs and other pollutants in the Bay Area. The program examines emissions from point sources, area sources, and on-road and off-road mobile sources with an emphasis on diesel exhaust, which is a major contributor to airborne health risk in California. The main objectives of the program are to:

1. Characterize and evaluate potential cancer and non-cancer health risks associated with exposure to TACs and other pollutants from both stationary and mobile sources throughout the Bay Area.
2. Assess potential exposures to sensitive populations including children, senior citizens, and people with respiratory illnesses.

3. Identify significant sources of emissions and prioritize use of resources to reduce exposure in the most highly impacts areas (i.e., priority communities).
4. Develop and implement mitigation measures such as grants, guidelines or regulations, to achieve cleaner air for the public and the environment, focusing initially on priority communities.

The CARE program is an on-going program that encourages community involvement and input. The technical analysis portion of the CARE program is being implemented in three phases that includes an assessment of the sources of TAC emissions, modeling and measurement programs to estimate concentrations of TAC, and an assessment of exposures and health risks. Throughout the program, information derived from the technical analyses will be used to focus emission reduction measures in areas with high TAC exposures and high density of sensitive populations.

The District's Regulation 11, Rule 18: Reduction from Air Toxic Emissions at Existing Facilities: Rule 11-18, adopted November 15, 2017, requires the District to conduct screening analyses for facilities that report TAC emissions within the District and calculate health prioritization scores based on the amount of TAC emissions, the toxicity of the TAC pollutants, and the proximity of the facilities to local communities. The District will conduct health risk assessments for facilities that have priority scores above a certain level. Based on the health risk assessment, facilities found to have a potential health risk above the risk action level would be required to reduce their risk below the action level, or install Best Available Retrofit Control Technology for Toxics on all significant sources of toxic emissions.

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

1. Air District Regulation 1: General Provisions and Definitions
2. Air District Regulation 2, Rule 1: Permits, General Requirements
3. Air District Regulation 2, Rule 2: New Source Review
4. Air District Regulation 2, Rule 5: New Source Review of Toxic Air Contaminants
5. Air District Regulation 2, Rule 6: Major Facility Review (Title V)
6. Air District Regulation 6, Rule 1: Particulate Matter, General Requirements
7. Air District Regulation 6, Rule 2: Miscellaneous Operations
8. Air District Regulation 8, Rule 5: Storage of Organic Liquids
9. Air District Regulation 8, Rule 6: Terminals and Bulk Plants
10. Air District Regulation 8, Rule 7: Gasoline Dispensing Facilities
11. Air District Regulation 8, Rule 8: Wastewater (Oil-Water) Separators
12. Air District Regulation 8, Rule 9: Vacuum Producing Systems
13. Air District Regulation 8, Rule 10: Process Vessel Depressurization
14. Air District Regulation 8, Rule 18: Equipment Leaks
15. Air District Regulation 8, Rule 22: Valves and Flanges at Chemical Plants
16. Air District Regulation 8, Rule 28: Episodic Releases from Pressure Relief Devices at Petroleum Refineries and Chemical Plants

17. Air District Regulation 8, Rule 33: Gasoline Bulk Terminals and Gasoline Delivery Vehicles
18. Air District Regulation 8, Rule 39: Gasoline Bulk Terminals and Gasoline Delivery Vehicles
19. Air District Regulation 8, Rule 44: Marine Vessel Loading Terminals
20. Air District Regulation 9, Rule 1: Sulfur Dioxide
21. Air District Regulation 9, Rule 2: Hydrogen Sulfide
22. Air District Regulation 9, Rule 7: Nitrogen Oxides and Carbon Monoxide from Industrial, Institutional, and Commercial Boilers, Steam Generators, and Process Heaters
23. Air District Regulation 9, Rule 8: Nitrogen Oxides and Carbon Monoxide from Stationary Internal Combustion Engines
24. Air District Regulation 9, Rule 9: Nitrogen Oxides and Carbon Monoxide from Stationary Gas Turbines
25. Air District Regulation 9, Rule 10: Nitrogen Oxides and Carbon Monoxide from Boilers, Steam Generators and Process Heaters in Petroleum Refineries
26. Air District Regulation 9, Rule 11: Nitrogen Oxides And Carbon Monoxide from Utility Electric Power Generating Boilers
27. Air District Regulation 11, Rule 1: Lead
28. Air District Regulation 11, Rule 8: Hexavalent Chromium
29. Air District Regulation 11, Rule 18: Risk Reduction from Air Toxic Emissions at Existing Facilities
30. Air District Regulation 12, Rule 11: Flare Monitoring at Petroleum Refineries
31. Air District Regulation 12, Rule 12: Flares at Petroleum Refineries
32. 40 CFR Part 63, Subpart CC: Petroleum Refineries (NESHAP)
33. 40 CFR Part 63, Subpart UUU: Petroleum Refineries: Catalytic Cracking, Catalytic Reforming, and Sulfur Plant Units (NESHAP)
34. 40 CFR Part 61, Subpart FF: Benzene Waste Operations (NESHAP)
35. 40 CFR Part 60, Subpart J: Standards of Performance for Petroleum Refineries (NSPS)
36. State Airborne Toxic Control Measure for Stationary Compression Ignition (Diesel) Engines (ATCM)

3.2.3 SIGNIFICANCE CRITERIA

The most recently available Air District draft CEQA guidelines established criteria pollutant thresholds for specific projects, general plans, and regional plans. The Air District's draft CEQA Guidelines (BAAQMD, 2017a) established criteria pollutant thresholds for air quality plans of "no net increase in emissions," which is appropriate for air quality plans because they include a mix of control measures with individual trade-offs. For example, one control measure may result in combustion to reduce reactive organic emissions, while increasing criteria pollutant emissions associated with combustion by a small amount. Those small increases in combustion emissions would be offset by decreases from other measures focused on reducing criteria pollutants. Because the proposed project is a Community Action Plan with the goal of reducing emissions, the criteria pollutant threshold for air quality plans of “no net increase in emissions” will apply to the proposed project.

In addition, the Air District will also (to the extent feasible) evaluate whether the Strategies in the West Oakland Community Action Plan could have potential impacts associated with toxic air contaminants (TACs). For TACs, the Air District will use two thresholds of significance, one for carcinogenic health impacts and one for non-carcinogenic health impacts. For non-carcinogenic impacts, the Air District will use a “Hazard Index” of 1 as the threshold of significance. A Hazard Index of 1 is the level of exposure below which there are not expected to be any observable adverse health effects, based on scientific studies. If the Strategy will result in localized concentrations of TACs that will expose people to a Hazard Index greater than 1.0, that will be considered a significant impact. For carcinogenic impacts, the Air District will use a threshold of “100 in one million” increased risk from all emissions sources within 1,000 feet. This means an exposure level that would be expected to produce 100 additional cancer cases if a population of one million people were exposed to that level of exposure over a 70-year lifetime. Under this threshold, there will be a significant localized impact if any person will be subjected to an additional carcinogenic risk of 100 in one million, taking into account all of the net increases in TAC emissions that will occur as a result of the Strategy within 1000 feet of the person.

3.2.4 EVALUATION OF AIR QUALITY IMPACTS

As discussed previously, the Notice of Preparation and Initial Study (NOP/IS) (see Appendix A) found that the implementation of the West Oakland Community Action Plan could result in secondary air quality impacts from implementing certain of the Strategies.

It is expected that the direct effects of the West Oakland Community Action Plan would be reductions in criteria pollutant and TAC emissions. However, construction equipment and activities to install air pollution control equipment, enclosures, and new infrastructure 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 air pollution control equipment. For example, some types of air pollution control equipment that use ammonia as part of the control process have the potential to generate emissions of the material that may be considered a TAC.

Potential secondary air quality impacts from construction activities and equipment that may be required under the West Oakland Community Action Plan are analyzed herein. The analysis identifies construction air quality impacts from air pollution control equipment that could be installed to comply with the Strategies (e.g., Selective Catalytic Reduction (SCR) and enclosures). This subchapter evaluates the potential construction and operational air quality impacts that could result due to implementation of the West

Oakland Community Action Plan. The potential air quality impacts are summarized in Table 3.2-10.

TABLE 3.2-10

Strategies to be Implemented by the Air District with Potential Air Quality Impacts

Strategy #	Description	Control Methodology	Potential Air Quality Impacts
61	District works with Schnizter Steel to study the feasibility of installing a shore power or bonnet system to capture vessel emissions	Bonnet system could include SCR and filtration system or shore power could be used.	Air quality impacts associated with increased use of ammonia/catalyst, etc.; Air impacts associated with increased energy generation
63	Amendments to existing District Reg 6-4 and 12-13 to reduce fugitive PM emissions from metal recycling and foundry operations	Emission Minimization Plans would be prepared and are expected to required enclosures for fugitive emission sources	Construction emissions associated with enclosures
Various Measures (14, 36, 43, 44, 48,49)	Conversion of Sources from conventional to zero emission sources.	Increased electrification of sources.	Increased demand for electricity so increased need from electric generating facilities with increase air emissions.

3.2.4.1 Potential Criteria Pollutant Impacts During Construction

The proposed Plan aims to reduce $PM_{2.5}$ and TAC emissions, although other criteria pollutants would also be reduced. The Strategies aim to reduce emissions and exposure to emissions by replacing conventional vehicles with zero emission vehicles, installing air pollution control equipment at stationary sources, reducing fugitive emissions at stationary sources (metal recycling and foundry operations), and installing filtration devices at sensitive receptor locations, among others. Construction activities may be necessary to implement some of the Strategies. Of the Strategies that the Air District proposes to implement, Strategy #63 would be expected to require Emission Minimization Plans for metal recycling and foundry operations. The most likely method of reducing emissions from these facilities is through the enclosure of operations. Construction activities may also be required for stationary sources, the installation of zero-emission infrastructure and other similar Strategies. The potential secondary adverse air quality construction impacts from implementation of Strategies, to the extent that information is known or can be estimated, are analyzed in this subsection.

Construction equipment associated could result in ROG, NO_x, SO_x, CO, PM_{10}, and $PM_{2.5}$ emissions, although the amount generated by specific types of equipment can vary greatly. As shown in Table 3.2-11, different types of equipment can generate construction emissions in much different quantities depending on the type of equipment.

For example, the estimated emissions of NO_x range from of 0.17 pound per hour (lb/hr) of NO_x for a forklift to 1.06 lbs/hr for a large drill rig. 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 absence 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.

TABLE 3.2-11

Emission Factors Associated with Typical Construction Equipment(1)

Equipment Type	VOC (lb/hr)	CO (lb/hr)	NOx (lb/hr)	SOx (lb/hr)	PM10 (lb/hr)
Aerial Lift	0.00	0.17	0.10	0.00	0.0
Backhoe	0.02	0.36	0.27	0.00	0.02
Compressor	0.02	0.21	0.13	0.00	0.03
Crane	0.05	0.40	0.72	0.00	0.03
Drill Rig	0.08	0.50	1.06	0.00	0.04
Excavator	0.02	0.51	0.31	0.00	0.01
Forklift	0.02	0.22	0.17	0.00	0.01
Front End Loader	0.05	0.44	0.60	0.00	0.03
Generator	0.02	0.28	0.13	0.00	0.01
Light Plants	0.02	0.29	0.13	0.00	0.01
Welding Machine	0.03	0.23	0.18	0.00	0.02

(1) Emission Factors from Off-Road 2011, Model Year 2019. CO emissions from SCAQMD, 2006: http://www.aqmd.gov/ceqa/handbook/offroad/offroadEF07_25.xls.

To calculate the potential construction emissions associated with the construction of one enclosure, it was assumed that construction activities would take about 60 days and would require 20 workers. It is also assumed that only one enclosure would be constructed at a time as Strategy #63 would affect one facility in West Oakland. The potential emissions associated with the construction of an enclosure are summarized in Table 3.2-12.

Construction activities may also be associated with other Strategies that the Air District would implement but the details of those construction activities are unknown and, therefore, speculative or expected to be very minor. Under Strategy #61, implementation of a bonnet system would most likely occur on a barge because of limited space near Schnitzer Steel and the adjacent Port. The equipment would be purchased and then placed on a barge. Because of the limited space, it is unlikely that the control system would be put together in West Oakland. It is more likely that the barge would be configured elsewhere and transported to Schnitzer Steel for use. Further, Strategy #70 could require building energy efficiency upgrades and the installation of high efficiency air filtration systems in existing schools, day care facilities, hospitals, apartments, and homes. The construction activities associated with this Strategy are expected to be minor and limited to 1-3 workers.

TABLE 3.2-12

Estimated Construction Emissions for Enclosures

ACTIVITY	ROG	CO	NOx	SOx	PM_{10}	$PM_{2.5}$
Peak Day Construction Emissions (lbs/day)						
Construction Activities for 1 Enclosure(1)	2.43	24.78	23.37	0.07	2.59	1.57
Construction Significance Thresholds(2)	54	--	54	--	82	54
Total Construction Estimates (tons emitted during construction period – tons/yr)						
Construction Activities for 1 Enclosure(1)	0.06	0.69	0.50	0.00	0.04	0.03
Construction Significance Thresholds(2)	10	--	10	--	15	10

(1) See Appendix B for detailed emissions calculations.
(2) BAAQMD, 2017a

The construction of additional electrical or hydrogen cell infrastructure would be required under several Strategies in the West Oakland Community Action Plan. The type of equipment, magnitude of any construction activities, location of the activities, etc., are currently unknown and considered to be speculative. However, additional construction activities associated with Strategies that the Air District would seek to implement are expected to be minor such as installing electric charging stations or hydrogen fuel stations, for example, which would likely be added to existing facilities (e.g., gas stations).

Based on the construction emissions in Tables 3.2-12, it is concluded that construction emissions associated with the Strategies that the Air District expects to implement under the West Oakland Plan would be below the Air District construction significance thresholds for criteria pollutants and would, therefore, be less than significant. Construction emissions are temporary as construction emissions would cease following completion of construction activities. Future projects proposed to implement Strategies by other government agencies presumably would complete further environmental analyses per CEQA.

3.2.4.2 Potential Criteria Pollutant Impacts During Operation

The net effect of implementing the West Oakland Community Action Plan is to reduce TAC and $PM_{2.5}$ emissions as well as exposure to emissions in West Oakland. However, some control technologies have the potential to generate secondary or indirect air quality impacts as part of the control process.

3.2.4.2.1 Air Pollution Control Equipment

The installation of a bonnet system to control emissions from marine vessels at berth (Strategy #61) could include emission control equipment to control particulate matter (e.g., baghouse) as well as other control equipment, such as a Selective Catalytic Reduction (SCR) Unit. While the West Oakland Community Action Plan does not require the control of NOx emissions, NOx is a major pollutant from marine engines and it is likely that control equipment to reduce NOx would be included in a bonnet system, if such a system were to be built.

SCR Units have been used to control NOx emissions from stationary sources for many years by promoting chemical reactions in the presence of a catalyst. Installation of new SCR equipment would be expected to increase the amount of ammonia used for NOx control. SCRs would require the additional deliver of ammonia or urea to the facilities where they are installed. In addition, the bonnet system would require servicing of the diesel particulate filter or other similar maintenance activities. It is estimated that a peak of two trucks per peak day would be required to delivery ammonia/urea, catalyst and other supplies, or about 40 truck trips per year would be required for the delivery of supplies. This amount could vary depending on the size of the SCR and size of the ammonia or urea storage systems. However, the 40 trucks per year is expected to provide a conservative estimate of transportation requirements. As shown in Table 3.2-13, indirect mobile source emissions from transport delivery trucks would be low. Truck trip emissions from transporting to and from facilities would not generate significant adverse operational air quality impacts or contribute to significant adverse operational air quality impacts that may be caused by other control technologies.

TABLE 3.2-13

Delivery Truck Emissions

Material	Criteria Pollutant					
	ROG	CO	NOx	SOx	PM_{10}	$PM_{2.5}$
Operational Emissions Per Facility (lbs/day)						
Ammonia/Catalyst for SCR	<0.01	0.03	0.12	<0.01	0.03	0.01
Operational Emissions Per Facility (Tons/year)						
Ammonia/Catalyst for SCR	<0.01	0.01	0.02	<0.01	0.01	<0.01

See Appendix B for detailed emission calculations.

The installation of an SCR Unit may potentially result in increased ammonia emissions due to "ammonia slip" (unreacted ammonia released in the exhaust). As a result, ammonia slip emissions could increase, thus, contributing to PM_{10} concentrations. Ammonia can be released in liquid form, thus, directly generating PM_{10} emissions. Ammonia can also be released in gaseous form where it is a precursor to PM_{10} emissions. Ammonia slip can increase as the catalyst ages and becomes less effective. Ammonia slip from SCR equipment can be continuously monitored and controlled. The SCR technology has progressed such that ammonia slip can be limited to five parts per million (ppm) or less. SCR vendors have developed better injection systems that result in a more even distribution of NOx ahead of the catalyst so that the potential for ammonia slip has been reduced. Similarly, ammonia injection rates are more precisely controlled by model control logic units that are a combination of feed-back control and feed forward control using a proportional/integral controller that sets flow rates by predicting SCR outlet ammonia concentrations and calibrating them to a set reference value. Installation of an SCR would require an Authority to Construct from the Air District. A limit on ammonia slip is normally included in air permits for stationary sources. Operators would be required to monitor ammonia slip by conducting an annual source test and maintain a continuous monitoring system to accurately indicate the ammonia-to-emitted-NOx mole ratio at the inlet of the SCR. In addition, the barge system would include a diesel particulate filter or some other similar type of particulate control, which could also control ammonia slip. These measures are expected to minimize potential air quality impacts associated with ammonia slip. Further, the bonnet system would be located on a barge within/adjacent to the Port and would be located about 0.5 mile from the closest residential area, further minimizing the potential for exposure to TAC emissions.

3.2.4.2.2 Secondary Impacts from Increased Electricity Demand

Implementing Strategies in the West Oakland Community Action Plan is expected to increase future demand for electricity in two ways. First, electricity is often used as the power source to operate various components of add-on control equipment that may be required to reduce emissions. Second, a number of Strategies may increase future demand for electricity as a result of increasing the penetration of electric on-road and off-road vehicles or replacing existing equipment with zero or near-zero emissions, electric-powered equipment. Although increasing the number of on-road and off-road electric vehicles in West Oakland, it is anticipated that the increased electricity generation emissions would be offset by emission reductions from removing gasoline and diesel-powered vehicles from district fleets.

Electricity Demand Impacts from Operating Control Equipment

There are a variety of different types of air pollution control equipment, such as SCRs and filters/baghouses associated with a bonnet system, that may require additional electricity. In the case of the bonnet system, it would be expected that the air pollution control equipment would be placed on a barge because of lack of space along the waterfront within and adjacent to the Port. Since the bonnet system would be placed on a barge, it would be operated through the diesel engines on the barge so that no increase in electricity from a public utility company would be required. See Section 3.2.4.4 for the estimated emissions decreased associated with the use of the bonnet system.

Strategy #70 that would place filtration devices on schools, day care facilities, hospitals, apartments, and homes, could place additional electricity demands to operate heaters or air conditioners. Increased demand for electrical energy may require generation of additional electricity, which in turn could result in increased indirect emissions of criteria pollutants in the Bay Area and in other portions of California that export electricity to the Bay Area. However, installation of high-energy efficient systems could help offset any electricity increases. Details on the filtration systems, ventilation systems, fan motors, where they would be located, how many would be installed, etc., are currently unknown. Therefore, the potential increase in electricity and the related air quality impacts are currently unknown and considered to be speculative.

Electricity Demand Impacts from Mobile Sources

Because of the need for ever more stringent emission control regulations to achieve all Ambient Air Quality Standards (AAQSs), electricity is becoming more important as an energy source to reduce emissions in a number of economic sectors, especially mobile sources. With regard to some of the West Oakland Strategies, assumptions have been made regarding future electricity demand. For example, several Strategies would increase future demand for electricity to achieve the control measures' targets of zero emissions from on-road and off-road vehicles. The following information summarizes the Strategies in the Plan that could result in an increase in future electricity demand:

1. Strategy #14: Provide financial incentives for local businesses to install energy storage systems (e.g., batteries, fuel cells) to replace stationary sources of pollution (e.g., back-up generators).

2. Strategy #36: Provide financial incentives for fueling infrastructure, and for low and zero emission equipment.

3. Strategy #43: Offer up to $7 million per year to replace older autos through the Vehicle Buy Back program, and up to $4 million per year through the Clean Cars for All program to replace older autos and provide an incentive for a hybrid electric, plug-in hybrid electric, battery electric vehicle, or funding for public transit.

4. Strategy #44: Offer financial incentives to replace box and yard diesel trucks with zero emission trucks.

5. Strategy #48: Offer financial incentives to replace long-haul diesel trucks with zero emission trucks.

6. Strategy #49: Offer up to $1 million in funding incentives to pay for the purchase of cleaner equipment, including electric lawn and garden equipment, Transportation Refrigeration Units, and cargo-handling equipment.

7. Strategy #61: Study the feasibility of installing shore power to marine vessels at Schnitzer Steel.

Increasing penetration of zero and near-zero emission vehicles would increase future demand for electricity in the Bay Area and other areas of California that provide electricity to the Bay Area. For the purpose of this analysis, a zero emission vehicle is assumed to be an electric vehicle. Near-zero vehicles are assumed to be plug-in hybrid sources. Potential increased electricity demand from West Oakland Community Action Plan Strategies that increase the penetration of zero on-road and off-road mobile sources are shown in Table 3.3-3 in Section 3.3 – Energy. Estimates of the potential increase in electricity use are provided where sufficient information is available to estimate the number of pieces of equipment or vehicles that would be required under each of the Strategies. In most cases, that information is not available and cannot be determined at this time.

As shown in Table 3.3-3, the potential increase in future demand for electricity to provide energy for on-road and off-road mobile sources associated with the West Oakland Plan is expected to be less than one gigawatt-hours (GWh) in the year 2021. Assuming Strategy #43 is implemented through 2023, the increase would be approximately one GWh in 2023 (see Table 3.3-3 for further details).

Electricity to Alameda County, including West Oakland, is supplied by Pacific Gas and Electric (PG&E). PG&E has prepared an Integrated Resources Plan (IRP) that outlines how the utility will shape its future energy portfolio to meet California's clean energy goals in a reliable and cost-effect manner. As part of the IRP (PG&E, 2018), PG&E has forecasted the potential load impacts on electricity demand that would be expected to occur from increased charging of electric vehicles in the future. PG&E has estimated that meeting the state's goal of five million electric vehicles (or two million within PG&E's service territory) by 2030 would increase the current electrical use for electric vehicles from about 160 GWh in 2018 to 2,353 GWh in 2022, to 4,205 GWh in 2026, and 5,982 GWh in 2030 (PG&E, 2018). PG&E plans to add resources to supply sufficient electricity to its customers for electric vehicles as well as from population growth. Most of the increases will come for additional bioenergy, solar, and wind resources due to the renewables portfolio standard (RPS) requirements.

While the electricity use associated with electric vehicles is expected to increase, PG&E predicts that its overall sales in electricity would increase slightly (up to eight percent). The expected increases in energy efficiency and solar photovoltaic projects are expected to offset a majority of the growth in electric vehicles, as well as economic and population driven growth (PG&E, 2018).

As part of the IRP process, PG&E is required to provide estimates of local air emissions from the plants that it operates. Air emissions associated with PG&E's facilities are forecasted to decrease (NOx) or stay flat ($PM_{2.5}$) through 2030 due to: (1) changes in PG&Es load and supply portfolio; (2) decreased combined heat and power emissions as units come off contracts; and (3) decreased biogas/biomass emissions (see Table 3.2-14) (PG&E, 2018). The electrification of motor vehicles and other commercial and industrial equipment would greatly reduce fossil fuel usage. The criteria pollutant emissions shown in Table 3.2-14 do not reflect the emission reductions from the transportation sector related to electrification of vehicles in California.

TABLE 3.2-14

PG&E Air Emission Forecast(1)

Source	2018	2022(2)	2026	2030
NOx Emissions (metric tons/year)				
CASIO Dispatchable Thermal Resources(2)	16	(43) to (83)	280-341	395-407
Combined Heat & Power	3,358	1,462	718	316
Biogas	1,060	1,289	1,285	836
Biomass	886	961	829	755
Total NOx Emissions	5,320	3,669	3,112-3,173	2,302-2,314
$PM_{2.5}$ Emissions (metric tons/year)				
CASIO Dispatchable Thermal Resources(2)	10	(26) to (50)	169-205	224-230
Combined Heat & Power	109	48	23	10
Biogas	9	15	17	17
Biomass	538	520	473	417
Total $PM_{2.5}$ Emissions	666	533-557	682-718	668-674

(1) Source: PG&E, 2018. Data presented are from both the Conforming and Preferred Scenarios.
(2) Numbers in parenthesis indicate negative numbers.
(3) Combined cycle gas turbines with emissions from start-ups, CTs, and reciprocating engines

The potential increase in electric vehicles under the Strategies in the West Oakland Community Action Plan are within the range of vehicles that PG&E has forecast for its service area of two million vehicles. As shown in Table 3.2-14, overall emissions associated with providing electricity from power plants is expected to decline or remain relatively consistent. Therefore, implementation of the Strategies is not expected to result in an increase in air emissions associated with electricity over those already contemplated in the PG&E service areas.

New power generation equipment within the Bay Area would be subject to Air District Regulation 9, Rule 9. New power generating equipment would not result in air quality impacts because they would be subject to Best Available Control Technology (BACT) requirements, and all emission increases would have to be offset (through emission reduction credits) before permits could be issued.

Electricity in California is also generated by alternative sources that include hydroelectric plants, geothermal energy, wind power, and solar energy, which are clean sources of energy. California's RPS requires retail sellers of electricity to increase their procurement of eligible renewable energy resources by at least one percent per year so that 33 percent of their retail sales are procured from eligible renewable energy resources by 2020, and 50 percent by December 31, 2030. 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. These regulatory requirements are expected to move California towards the use of more renewable sources of electricity, reducing the use of fossil fuels. These renewable sources of electricity generate little, if any, air emissions. Increased use of these and other clean technologies will continue to minimize emissions from the generation of electricity.

The West Oakland Community Action Plan is designed to reduce PM and TAC emissions and reduce exposure to TACs. The Plan has the potential to create impacts on electricity demand; however, the existing and future air quality, greenhouse gas rules and regulations, and RPS requirements are expected to minimize operational emissions associated with increased electrical generation. Furthermore, electricity providers are moving towards compliance with California's RPS and generating 50 percent of their electricity from renewable energy resources by 2030.

Concurrent with increased demand for electricity associated with electric vehicles, it is expected that emissions from the combustion of gasoline or diesel fuels would be reduced (see Table 3.2-15). Combustion emissions from gasoline and diesel fuels would be displaced by combustion emissions from natural gas, which is the primary fuel used for generating electricity in the district. However, as discussed above, new sources of electricity are generally from renewable energy sources (e.g., solar). Emissions from diesel combustion (e.g., marine vessel engines) are orders of magnitude higher than emissions from the combustion of natural gas. So, overall combustion emissions from energy production are expected to decline in the future. Therefore, no significant adverse impacts to air quality are expected from control measures requiring increased demand for electricity.

TABLE 3.2-15

Potential Reduction in Fuel Use Associated With Implementation of the West Oakland Community Action Plan

Strategy	Reduced Fuel Use (gals/yr)[(a)]
Strategy 43 – offer up to $7 million per year to replace older vehicles through the Vehicle Buy Back Program (estimated 60-80 vehicles)	16,963 – 22,618
Strategy 43 – offer up to $4 million per year to replace older vehicles through the Cleaner Cars for All program (estimated 40-50 vehicles)	11,309 – 14,136
Potential Reduction in Fuel Use	**28,272 – 36,754**

(a) See Appendix B for detailed emission calculation assumptions.

3.2.4.3 Potential Toxic Air Contaminant Impacts

Unreacted ammonia emissions generated from SCR units are referred to as ammonia slip. Best Available Control Technology (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)[6]. Thus, the peak concentration of ammonia at a receptor

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

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 $\mu g/m^3$) and acute (3,200 $\mu g/m^3$) reference exposure levels (RELs). Table 3.2-16 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.

TABLE 3.2-16

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 exit of the stack (SCAQMD, 2015b). The dispersion factor is based on local meteorology.
(3) Hazard index = conc. at receptor 25 m from stack, ug/m^3/REL, ug/m^3

In general, it should be noted that in addition to the estimated TAC emission increases that may occur due to the use of an SCR system, a reduction in TAC emissions would also be expected. The goal of the West Oakland Community Action Plan is to reduce emissions of $PM_{2.5}$ and TACs, as well as exposure to those pollutants. The Plan is expected to result in reduced emissions from diesel particulate matter by reducing the use of conventional mobile sources and encouraging the use of zero and near-zero emission mobile sources, among other strategies.

However, it is not possible to estimate the potential TAC emissions reductions at this point until the sources that will be controlled are known and the appropriate engineering analyses have been completed and so forth. Nonetheless, the reduction in use of conventional fuels as outlined in Table 3.2-15 is expected to result in a reduction in TAC emissions in the West Oakland areas. Therefore, TAC emissions associated with the proposed project are expected to be less than significant.

3.2.4.4 Air Quality Benefits

Emission benefits from certain measures in the West Oakland Community Action Plan that the Air District will implement are presented in Table 3.2-17. For some of the potential Strategies, emission reductions are unknown at this time. For particular sources or pollutants, there may be uncertainties associated with emission estimates or the level of control and emission reductions achievable, and further study and evaluation would be required to develop more detailed estimates.

Under Strategy #43, the District is proposing up to $7 million per year to replace older autos through the Vehicle Buy Back program and up to $4 million per year through the

Cleaner Cars for All program to replace older autos and provide an incentive for zero emission vehicles. The number of vehicles that may be retired under this Strategy is up to 60-80 per year for the Vehicle Buy Back Program and up to 40-50 per year for the Cleaner Cars for All program (see Table 3.2-17).

Emission reduction estimates have also been provided for providing shore power to Schnitzer Steel as it is expected to be the better choice for reducing emissions from ships at berth. The emission calculations assume that ships would be at dock 100 days per year and assumes the hotel emissions are 80 percent from shore power and 20 percent for the auxiliary engine (see Appendix B for detailed emission calculations).

Finally, emission reductions have also been provided for the partial enclosure of storage piles at metal recycling and foundry operations. It was assumed that five 100-foot diameter by 40-foot high conical storage piles were enclosed with an estimated control of 95 percent (see Appendix B for detailed emission calculations).

TABLE 3.2-17

West Oakland Community Action Plan Predicted Emission Reductions

Strategy	Estimated Emission Reductions Criteria Air Pollutants (tons/yr)					
	ROG(1)	CO(1)	NOx(1)	SOx(1)	PM_{10}(1)	$PM_{2.5}$(1)
#43 Vehicle Buy Back Program(2)	(0.76)–(1.01)	(3.94)-(5.25)	(0.57)-(0.76)	<0.00	(0.03)–(0.04)	(0.02)
#43 Cleaner Cars for All Program(2)	(0.51)-(0.63)	(2.62)-(3.28)	(0.38)-(0.48)	<0.00	0.03	0.01
#61 Shore Power to Schnitzer Steel	(0.18)	(0.30)	(6.23)	(0.21)	(0.13)	(0.12)
#63 Reduction from Enclosures	--	--	--	--	(0.79)	(0.12)
Total Emissions (tons/yr)	(1.45)-(1.82)	(6.86)-(8.83)	(7.18)-(7.47)	(0.21)	(0.92)-(0.93)	(0.25)
Total Emissions (lbs/day)	(7.95)-(9.97)	(37.59)-(48.38)	(39.34)-(40.93)	(1.15)	(5.04)-(5.10)	(1.37)

(1) Numbers in parenthesis indicate negative numbers.
(2) See Appendix B for complete detailed emission calculations.

3.2.4.5 Summary of Operational Emission Impacts

As shown in Table 3.2-18, the implementation of the Strategies by the Air District would result in a minor increase in emissions associated with the potential delivery of materials to supply air emission control systems that would be implemented as part of the Plan. The potential emission increases are expected to be offset with emission decreases that would occur due to implementation of the Plan (see Table 3.2-18).

Based on the evaluation of the Strategies that the Air District would implement as part of the West Oakland Community Action Plan, the emission reductions associated with the

Plan are expected to exceed the potential air quality increases and there would be no net emission increases. Therefore, air quality impacts would be less than significant.

TABLE 3.2-18

Operational Emissions Under Strategies that the Air District Would Implement under the West Oakland Community Action Plan

ACTIVITY	ROG	CO	NOx	SOx	PM_{10}	$PM_{2.5}$
Daily Concurrent Operational Emissions (lb/day)						
Delivery Trucks for Bonnet System	<0.01	0.03	0.12	<0.01	0.03	0.01
Reductions from Project Implementation(1)	(7.95)-(9.97)	(37.59)-(48.38)	(39.34)-(40.93)	(1.15)	(5.04)-(5.10)	(1.37)
Net Concurrent Emissions(2)	(7.95)-(9.97)	(37.56)-(48.35)	(39.22)-(40.81)	(1.15)	(5.01)-(5.07)	(1.36)
Significant?	**No**	**--**	**No**	**--**	**No**	**No**
Annual Concurrent Operational Emissions (tons/yr)						
Delivery Trucks for Bonnet System	<0.01	0.01	0.02	<0.01	0.01	<0.01
Reductions from Project Implementation(1)	(1.45)-(1.82)	(6.86)-(8.83)	(7.18)-(7.47)	(0.21)	(0.92)-(0.93)	(0.25)
Net Concurrent Emissions(2)	(1.45)-(1.82)	(6.85)-(8.82)	(7.16)-(7.45)	(0.21)	(0.91)-(0.92)	(0.25)
Significant?	**No**	**--**	**No**	**--**	**No**	**No**

(1) See Table 3.2-17. Assumes 365 days of operations.
(2) Numbers in parenthesis indicate emission reductions.

Additionally, specific information regarding a number of the Strategies that the Air District would implement are not currently available. For example, additional emission reductions would be expected from: (1) Strategies #44 and #48 replacing diesel trucks with zero emission trucks; (2) Strategy #45 to upgrade tugs and barges with cleaner engines; (3) Strategy #46 to upgrade locomotives with cleaner engines; (4) Strategy #49 to purchase cleaner electric lawn and garden equipment, battery electric Transportation Refrigeration Units, and cargo-handling equipment; and (4) Strategy #65 to replace existing diesel stationary and standby engines with Tier 4 diesel or cleaner engines. Additional emissions reductions would be expected from these and other Strategies that would be implemented by other agencies. However, sufficient information is not available to estimate the potential emission reductions at this time.

3.2.5 MITIGATION MEASURES

Air quality impacts associated with the implementation of the Strategies by the Air District as part of the West Oakland Community Action Plan are expected to be less than significant; therefore, no mitigation measures are required. However, the following measures are recommended to minimize increases associated with construction activities to implement Strategies in the West Oakland Community Action Plan.

On-Road Mobile Sources:

A-1 Construction activities should require the preparation of an Emission Management Plan 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/from the site 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-2 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-3 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-4 The facility operator shall survey and document the locations of construction areas and identify all construction areas that are served by electricity. Electric welders shall be used in all construction areas that are demonstrated to be served by electricity. Onsite electricity rather than temporary power generators shall be used in all construction areas that are demonstrated to be served by electricity.

A-5 If cranes are required for construction, cranes rated 200 hp or greater equipped with Tier 4 or equivalent engines shall be used. 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.

A-6 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.

3.2.6 CUMULATIVE 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(b) requires that an EIR's "discussion of cumulative impacts reflect the severity of the 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:

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

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

3. "[A] cumulative impact consists of an impact which 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)).

3.2.6.1 Criteria Air Pollutants

3.2.6.1.2 Operational Air Quality Impacts

As noted above, implementation of the Strategies in the West Oakland Community Action Plan by the Air District is not expected to generate significant adverse project-specific air quality impacts and is not expected to exceed the applicable significance thresholds (result in an increase in emissions). These thresholds represent the levels at which a project's individual emissions would result in a cumulatively considerable contribution to the Air District's existing air quality conditions for individual projects (BAAQMD, 2017a). As a result, air quality impacts from the proposed project are not considered to be cumulatively considerable pursuant to CEQA Guidelines §15064 (h)(1). As discussed above, the West Oakland Community Action Plan is expected to result in more emission reductions than increases. It is not possible to estimate all of those emission reductions at this point until specific information for the Strategies has been identified, appropriate engineering analyses have been completed and so forth. It is expected that the potential emissions increases would be offset with emission decreases.

As described in the EIR for the Clean Air Plan (BAAQMD, 2017), air quality within the Bay Area has improved since 1955 when the Air District was created and is projected to continue to improve. This improvement is mainly due to lower-polluting on-road motor vehicles, more stringent regulation of industrial sources, and the implementation of emission reduction strategies by the Air District. This trend towards cleaner air has occurred in spite of continued population growth. The Air District is in attainment of the State and federal ambient air quality standards for CO, NO_2, and SO_2.

However, the Bay Area is designated as a non-attainment area for the federal and state 8-hour ozone standard. The State 8-hour standard was exceeded on 6 days in 2017 in the Air District, most frequently in the Eastern part of the District (Livermore, Patterson Pass, and San Ramon) and the Santa Clara Valley (see Table 3.2-2). The federal 8-hour standard was also exceeded on 6 days in 2017. The Air District is unclassified for the federal 24-hour PM_{10} standard and is non-attainment with the State 24-hour PM_{10} standard. Since the District is not in attainment for the federal and state ozone standard, the state 24-hour PM_{10} standard, and the federal 24-hour $PM_{2.5}$ standard, past projects and activities have contributed to the nonattainment air quality impacts that are cumulatively significant.

The 2017 Clean Air Plan contains numerous control measures that the District intends to impose to improve overall air quality in the District. Control measures in the 2017 Clean Air Plan contain a number of other control measures to control emissions from stationary sources. The 2017 Clean Air Plan is expected to result in overall reductions in ROG, NOx, SOx, and PM emissions, providing an air quality benefit (BAAQMD, 2017). As reported in the Final EIR for the 2017 Clean Air Plan, large emission reductions are expected from implementation of the 2017 Plan including reductions in ROG emissions of 1,596 tons/year; NOx emissions of 2,929 tons/year, SOx emissions of 2,590 tons/year, and $PM_{2.5}$ emissions of 503 tons/year (see Table 3.2-21 of the Final EIR, BAAQMD

2017). These emission reductions are expected to help the Bay Area come into compliance or attainment with the federal and state 8-hour ozone standard, the federal and state PM_{10} standards, the federal 24-hour $PM_{2.5}$ standards, and the state 24-hour $PM_{2.5}$ standard, providing both air quality and public health benefits. Emission reductions from the 2017 Clean Air Plan, in conjunction with the Strategies in the West Oakland Community Plan, are expected to far outweigh any potential secondary emission increases associated with implementation of the Strategies in the West Oakland Community Action Plan, providing a beneficial impact on air quality and public health.

3.2.6.2 Toxic Air Contaminants

It was concluded for the analysis of TAC air quality impacts, that TAC emissions from the use of ammonia 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 the proposed project, (e.g., reduction in the use of diesel fuel and the emissions of diesel particulate matter), but those emission reductions and the related health risk benefits cannot be estimated at this time.

CHAPTER 3.3

ENERGY

Environmental Setting
Regulatory Setting
Existing Setting
Significance Criteria
Environmental Impacts
Mitigation Measures
Cumulative Energy Impacts

This page intentionally left blank.

3.3 ENERGY

This subchapter of the EIR evaluates the potential energy impacts associated with implementation of the West Oakland Community Action Plan, which aims to reduce residents' exposure to diesel PM, fine particulate matter, and TACs.

As discussed in the Initial Study, in accordance with AB 617, the Community Action Plan was developed through monthly meetings with the West Oakland Steering Committee and provides strategies to reduce exposure to air pollution and related health effects in West Oakland. The Notice of Preparation and Initial Study (see Appendix A) evaluated the potential energy impacts associated with implementation of the Strategies in the Community Action Plan. The Notice of Preparation and Initial Study determined that some Strategies have the potential to increase electricity demand due to measures that encourage the use of zero emission mobile sources and provide shore power to ships. This subchapter evaluates the potential energy impacts that could result due to implementation of the West Oakland Community Action Plan.

3.3.1 ENVIRONMENTAL SETTING

Power plants in California provided approximately 70.65 percent of the total in-state electricity demand in 2017, of which 29.65 percent came from renewable sources such as biomass, solar, and wind power. The Pacific Northwest provided another 13.65 percent of total electricity demand and the remaining 15.69 percent was imported from the Southwest (CEC, 2019a). The total electricity used in California in 2017 was 292,039 gigawatts (GWh)[1].

The contribution between in-state and out-of-state power plants depends upon, among other factors, the precipitation that occurred in the previous year and the corresponding amount of hydroelectric power that is available. The installed capacity of the 1,520 in-state power plants [greater than 0.1 megawatts (MW)[2]] totaled 88,003 MW (CEC, 2019b). The Pittsburg Generating Station, located in Contra Costa County, is currently the only facility located within Air District jurisdiction that ranks within the top ten power generating facilities in California. Smaller power plants and cogeneration facilities are located throughout the Bay Area. Pacific Gas and Electric (PG&E) is the primary supplier of electricity to northern California, including the Bay Area.

When signed into law in 1996, the electricity market in California was restructured under Assembly Bill 1890 (AB 1890) (Brulte 1995). Restructuring involved decentralizing the generation, transmission, distribution and customer services, which had previously been integrated into individual, privately-owned utilities. The objective of restructuring was to increase competition in the power generation business, while increasing customer choice

[1] A gigawatt equals one billion (10^9) watts of electricity.
[2] A megawatt equals one million watts.

through the Power Exchange. Additionally, the goal was to release control by privately-owned utilities of their transmission lines to a central operator called the Independent System Operator (ISO).

AB 1890 states the Legislature's intention that the State's publicly-owned utilities voluntarily give control of their transmission facilities to the ISO, just as is required of the privately-owned utilities. However, changes instituted by AB 1890 do not apply to them to the same extent as the privately-owned utilities. Power plants within California supply most of California's electricity demand while power plants from the Pacific Northwest, and power plants in the southwestern U.S. provide for California's out-of-state needs. The majority of power generated in the Bay Area comes from plants located in Contra Costa County.

The Pittsburg Generating Station, Delta Energy Center, and Marsh Landing Generating Center are the three largest power plants within Bay Area, providing 1,029, 860, and 828 MW respectively and are fueled primarily by natural gas. Due to an explosion in January 2017, the Pittsburg Generating Station was shut down for the first half of 2017. It was partially restarted in June of 2017 to meet summer demand and then shut down again in October to finish repairs. The Pittsburg Generation Station repairs were completed in January 2018 (East Bay Times, 2018). There are five additional facilities that produce over 500 MW in the Bay Area; the Russel City Energy Company Facility in Alameda (625 MW), the Gateway Generating Station in Contra Costa (613 MW), the Los Medanos Energy Center in Contra Costa (594 MW), the Metcalf Energy Center in Santa Clara (566 MW), and the Shiloh Wind Power Plant in Solano (CEC, 2019b). Additionally, the Altamont Pass Wind Farm located in Alameda is capable of producing 576 MW of electricity. No other facilities within the Bay Area provide over 250 MW of power.

Local electricity distribution service is provided to customers within the Air District by privately-owned utilities such as PG&E. Many public-owned utilities, such as Alameda Power and Telecom, East Bay Municipal Utility District, Silicon Valley Power, and the Santa Clara Electric Department also provide service. PG&E is the largest electricity utility in the Bay Area, with a service area that covers all, or nearly all, of Alameda, Contra Costa, Marin, Napa, San Francisco, San Mateo, Santa Clara, Solano, and Sonoma counties. PG&E provides over 90 percent of the total electricity demand in the Air District (CEC, 2015). The City of Oakland operates three 55 MW fossil fuel plants that supplement PG&E's electricity generation.

Table 3.3-1 shows the amount of electricity delivered to residential and non-residential entities in the counties in the Bay Area in 2017.

TABLE 3.3-1

Bay Area Utility Electricity Consumption by County for 2017
(million kilowatt-hour – kWh)[(1)]

County	Non-Residential	Residential	Total
Alameda	8,043	3,070	11,113
Contra Costa	6,809	2,969	9,778
Marin	718	677	1,395
Napa	685	380	1,065
San Francisco	4,221	1,519	5,740
San Mateo	2,805	1,562	4,367
Santa Clara	13,139	4,050	17,189
Solano	2,102	1,101	3,203
Sonoma	1,679	1,361	3,040
		Total Electricity Consumption:	56,890

Source: CEC, 2019c – Electricity Consumption by County

(1) All usage expressed in millions of kilowatt-hour (kWh): kWh is the most commonly used unit of measure telling the amount of electricity consumed over time. It means one kilowatt (1000 watts) of electricity supplied for one hour.

There are no other major facilities listed as pending construction or under review on the California Energy Commission's "Status of All Projects" webpage (CEC, 2019d). Two smaller facilities are listed but are planned specifically to provide uninterrupted power for private data centers.

3.3.2 REGULATORY SETTING

3.3.2.1 Federal Regulations

Federal and state agencies regulate energy use and consumption through various means and programs. On the federal level, the United States Department of Transportation (U.S. DOT), United States Department of Energy (U.S. DOE), and United States Environmental Protection Agency (U.S. EPA) are three agencies with substantial influence over energy policies and programs. Generally, federal agencies influence transportation energy consumption through establishment and enforcement of fuel economy standards for automobiles and light trucks, through funding of energy related research and development projects, and through funding for transportation infrastructure projects.

Energy Policy and Conservation Act, and CAFE Standards: The Energy Policy and Conservation Act (EPCA) of 1975 established nationwide fuel economy standards in order to conserve oil. Pursuant to this Act, the National Highway Traffic and Safety Administration, part of the U.S. DOT, is responsible for revising existing fuel economy standards and establishing new vehicle fuel economy standards. The Corporate Average Fuel Economy (CAFE) program was established to determine vehicle manufacturer compliance with the government's fuel economy standards. Compliance with CAFÉ standards is determined based on each manufacturer's average fuel economy for the portion of their vehicles produced for sale in the United States. The U.S. EPA calculates a CAFE value for each manufacturer based on city and highway fuel economy test results and vehicle sales. The CAFE values are a weighted harmonic average of the EPA city and highway fuel economy test results. Based on information generated under the CAFE program, the U.S. Department of Transportation is authorized to assess penalties for noncompliance. Under the Energy Independence and Security Act of 2007 (described below), the CAFE standards were revised for the first time in 30 years.

Energy Policy Act of 1992 (EPACT92): EPACT92 is comprised of twenty-seven titles. It was passed by Congress and set goals, created mandates, and amended utility laws to increase clean energy use and improve overall energy efficiency in the United States. EPACT92 established regulations requiring certain federal, state, and alternative fuel provider fleets to build an inventory of alternative fuel vehicles. EPACT92 was amended several times in the Energy Conservation and Reauthorization Act of 1998 and in 2005 via the Energy Policy Act in 2005, which emphasized alternative fuel use and infrastructure development.

Energy Policy Act of 2005: The Energy Policy Act of 2005 addresses energy efficiency; renewable energy requirements; oil, natural gas and coal; alternative-fuel use; tribal energy, nuclear security; vehicles and vehicle fuels, hydropower and geothermal energy, and climate change technology. The Act provides revised annual energy reduction goals (two percent per year beginning in 2006), revised renewable energy purchase goals, federal procurement of Energy Star or Federal Energy Management Program-designated products, federal green building standards, and fuel cell vehicle and hydrogen energy system research and demonstration.

Energy Independence and Security Act of 2007 (EISA): The EISA of 2007 was signed into law on December 19, 2007. The objectives of the Act are to move the United States toward greater energy independence and security, increase the production of clean renewable fuels, protect consumers, increase the efficiency of products, buildings and vehicles, promote greenhouse gas research, improve the energy efficiency of the Federal government, and improve vehicle fuel economy.

The renewable fuel standard in EISA requires 36 billion gallons of ethanol per year by 2022, with corn-based ethanol limited to 15 billion gallons. The CAFE standard for light duty vehicles is 35 miles per gallon by 2020. EISA also specifies that vehicle attribute-based standards are to be developed separately for cars and light trucks. EISA creates a CAFE credit and transfer program among manufacturers and across a manufacturer's fleet. It allowed an extension through 2019 of the CAFE credits specified under the Alternative Motor Fuels Act. It established appliance energy efficiency standards for boilers, dehumidifiers, dishwashers, clothes washers, external power supplies, commercial walk-in coolers and freezers, federal buildings; lighting energy efficiency standards for general service incandescent lighting in 2012; and standards for industrial electric motor efficiency.

Heavy-Duty National Program: The Heavy-Duty National Program was adopted on August 9, 2011, to establish the first fuel efficiency requirements for medium- and heavy-duty vehicles beginning with the model year 2014.

3.3.2.2 State Regulations

On the state level, the California Public Utilities Commission (CPUC) and California Energy Commission (CEC) are two agencies with authority over different aspects of energy. The CPUC regulates privately-owned electric, natural gas, telecommunications, water, railroad, rail transit, and passenger transportation companies. The CEC collects and analyzes energy-related data; forecasts future energy needs; promotes energy efficient and conservation by setting appliance and building energy efficiency standards; supports energy research; develops renewable energy resources, promotes alternative and renewable transportation fuels and technologies; certifies thermal power plants 50 megawatts and larger; and plans for and directs state response to energy emergencies. Some of the more relevant federal and state transportation-energy-related laws and plans are discussed in the following subsections.

California Building Energy Efficiency Standards (Title 24): California established statewide building energy efficiency standards following legislative action. The legislation required the standards to be cost-effective based on the building life cycle and to include both prescriptive and performance-based approaches. The 2005 Building Energy Efficiency Standards were first adopted in November 2003, and took effect October 1, 2005. Subsequently the standards have undergone two updates, one in 2008 and one in 2013. The 2016 Standards went into effect on January 1, 2017 for new construction of, and additions and alterations to, residential and nonresidential buildings.

California Green Building Standards Code (CALGreen): CALGreen is a statewide regulatory code for all residential, commercial, hospital, and school buildings and includes both mandatory and voluntary components that can be adopted by local jurisdictions. CALGreen is intended to encourage more sustainable and environmentally-friendly building practices, require low emitting substances that do not cause harm to the environment, conserve natural resources, and promote the use of energy-efficient materials and equipment. The five CALGreen categories include: (1) Planning and Design; (2) Energy Efficiency; (3) Water Efficiency and Conservation; (4) Material Conservation and Resource Efficiency; and (5) Environmental Quality. CALGreen became mandatory on January 1, 2011, for new residential and commercial construction.

California Building Standards: The California Building Standards Commission approved a standard that will require solar power on single-family and multi-family dwellings (including condos and apartment buildings up to three stores) built in California after 2020.

AB 1007 – Alternative Fuels Plan: The Alternative Fuels Plan adopted in 2007 by the State Energy Resources Conservation and Development Commission and CARB as required under state law, AB 1007 (Pavley 2005), recommends that the governor set targets on a gasoline gallon equivalent basis for use of ten different alternative motor fuels in the on-road and off-road sectors by nine percent by 2012, 11 percent by 2017, and 26 percent by 2022. These goals will require a dramatic expansion in the use of such fuels as electricity, compressed natural gas, hydrogen, renewable diesel, bio-diesel and ethanol in motor vehicles. Also built into the Alternative Fuels Plan is a multi-part strategy to develop hybrid and electric vehicle technologies; build the infrastructure to deliver the alternative fuels; increase the blending of more biofuels into gasoline and diesel; improve the fuel efficiency of vehicles; and reduce vehicle miles traveled by California motorists with more effective land use planning.

California Solar Initiative: On January 12, 2006, the CPUC approved the California Solar Initiative (CSI), which provided $2.2 billion in incentives between 2007 and 2016. CSI is part of the Go Solar California campaign, and builds on 10 years of state solar rebates offered to California's IOU territories: Pacific Gas & Electric (PG&E), Southern California Edison (SCE), and San Diego Gas & Electric (SDG&E.) The California Solar Initiative is overseen by the CPUC, and has a goal of installing 200,000 new solar hot water systems and approximately 1,940 MW of new solar generation capacity.

AB 2514 – Energy Storage Systems: AB 2514 (Skinner 2010) requires the CPUC to adopt an energy storage system procurement target, if determined to be appropriate, to be achieved by each load-serving entity by December 31, 2015, and a 2nd target to be achieved by December 31, 2020. The bill would require the governing board of a local publicly owned electric utility to adopt an energy storage system procurement target, if determined to be appropriate, to be achieved by the utility by December 31, 2016, and a second target to be achieved by December 31, 2021. The bill would require each load-serving entity and local publicly-owned electric utility to report certain information to the CPUC, for a load-serving entity, or to the Energy Commission, for a local publicly-owned electric utility.

Executive Order B-16-2012: Executive Order B-16-2012 establishes long-term targets of reaching 1.5 million zero-emission vehicles on California's roadways by 2025 and sets zero-emission vehicle purchasing requirements for State Government fleets. Executive Order B-16-2012 also sets a target for 2050 of a reduction of GHG emissions from the transportation sector equaling 80 percent less than 1990 levels. In February 2013, an interagency working group developed the zero-emission vehicle Action Plan, which identifies specific strategies and actions that State agencies will take to meet the milestones of the Executive Order. The Zero-Emission Vehicle Action Plan states: "*Zero-Emission Vehicles are crucial to achieving the state's 2050 greenhouse gas goal of 80 percent emission reductions below 1990 levels, as well as meeting federal air quality standards. Achieving 1.5 million Zero-Emission Vehicles by 2025 is essential to advance the market and put the state on a path to meet these requirements.*"

Renewables Portfolio Standard: California's renewables portfolio standard (RPS) requires retail sellers of electricity to increase their procurement of eligible renewable energy resources by at least one percent per year so that 20 percent of their retail sales are procured from eligible renewable energy resources by 2017. If a seller falls short in a given year, they must procure more renewables in succeeding years to make up the shortfall. Once a retail seller reaches 20 percent, they need not increase their procurement in succeeding years. RPS was enacted via SB 1078 (Sher 2002), signed in September 2002. The CEC and the CPUC are jointly implementing the standard. In 2006, RPS was modified by SB 107 (Simitan 2006) to require retail sellers of electricity to reach the 20 percent renewables goal by 2010. In 2011, RPS was further modified by SB 2 (Atkins 2017) to require retailers to reach 33 percent renewable energy by 2020.

California SB 350: SB 350 (DeLeon 2015) was approved 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.

Executive Order B-18-12: Executive Order B-18-12 was signed into law on April 25, 2012 directing state agencies to reduce their grid-based energy purchases by at least 20 percent by 2018, as compared to a 2003 baseline. Pursuant to Executive Order B-18-12, all new state buildings and major renovations beginning design after 2025 shall be constructed as Zero Net Energy facilities with an interim target for 50 percent of new facilities beginning design after 2020 to be Zero Net Energy. State agencies shall also take measures toward achieving Zero Net Energy for 50 percent of the square footage of existing state-owned building area by 2025 and reduce water use by 20 percent by 2020. Additionally, the following measures relevant to energy are required:

1. Any proposed new or major renovation of state buildings larger than 10,000 square feet shall use clean, on-site power generation, such as solar photovoltaic, solar thermal and wind power generation, and clean back-up power supplies, if economically feasible;

2. New or major renovated state buildings and build-to-suit leases larger than 10,000 square feet shall obtain LEED "Silver" certification or higher, using the applicable version of LEED;

3. New and existing buildings shall incorporate building commissioning to facilitate improved and efficient building operation; and,

4. State agencies shall identify and pursue opportunities to provide electric vehicle charging stations, and accommodate future charging infrastructure demand, at employee parking facilities in new and existing buildings.

3.3.2.3 Local Regulations

The U.S. DOE Clean Cities Program promotes voluntary, locally based government/industry partnerships for the purpose of expanding the use of alternatives to gasoline and diesel fuel by accelerating the deployment of alternative fuel vehicles and building a local alternative fuel vehicle refueling infrastructure. The mission of the Clean Cities Program is to advance the nation's energy security by supporting local decisions to adopt practices that contribute to the reduction of petroleum consumption. Clean Cities carries out this mission through a network of more than 80 volunteer coalitions, which develop public/private partnerships to promote alternative fuels and vehicles, fuel blends, fuel economy, hybrid vehicles, and idle reduction.

City of Oakland Sustainability Programs: The City of Oakland's sustainability programs are administered under the Oakland Sustainability Community Development Initiative, which was created in 1998 under Ordinance 74675 CMS. The City's sustainability programs range from the encouragement of green building practices to the replacement of heavy-duty diesel trucks. Oakland has funded a Phase I feasibility study and Phase II implementation plan to become a community choice aggregator, which would allow the City to purchase electricity on behalf of its energy users. Potential benefits of becoming an aggregator include increase use of renewable energy sources to meet Oakland's energy needs and a reduction in electricity costs.

City of Oakland Green Building Ordinance and Sustainable Green Building Requirements for Private Development: The City of Oakland adopted a Civic Green Building Ordinance in May 2005, requiring City-owned and occupied buildings to meet specific green building standards set by the U.S. Green Building Council's Leadership in Energy and Environmental Design (LEED) rating system. In October 2010, the City adopted mandatory green building standards for private development projects. The intent of the mandatory green building standards is to integrate environmentally sustainable strategies in building construction and landscapes in Oakland.

City of Oakland Energy and Climate Action Plan: The Oakland Energy and Climate Action Plan (ECAP) was adopted on December 4, 2012. The purpose of the ECAP is to identify and prioritize actions the City of Oakland can take to reduce energy consumption and GHG emissions. The ECAP recommends GHG reduction actions and establishes a framework for coordinating implementation, as well as monitoring and reporting on progress.

The primary sources of Oakland's GHG emissions are transportation and land use, building energy use, and material consumption and waste. Oakland approved a preliminary GHG reduction target for the year 2020 of 36 percent below 2005 levels. The ECAP recommends over 150 actions to be implemented over a ten-year period that would enable the City of Oakland to achieve a 36 percent reduction in GHG emissions. Implementation of renewable energy and energy efficiency measures include measures to reduce vehicle miles traveled annually by 20 percent, electricity consumption by 32 percent and natural gas consumption by 14 percent. These measures include the adoption of a green building ordinance for private development, the use of property-based financing for alternative energy systems, and advancing the use of transit. The ECAP was updated in 2018 to provide updates to the City's actions, but there were no changes to the GHG reduction goals.[3]

3.3.3 SIGNIFICANCE CRITERIA

The impacts to energy will be considered significant if any of the following criteria are met:

- The project uses energy resources in a wasteful, inefficient, or unnecessary manner.
- The project conflicts with or obstructs a state or local plan for renewable energy or energy efficiency.

3.3.4 EVALUATION OF ENERGY IMPACTS

As discussed previously, the Notice of Preparation and Initial Study (see Appendix A) found that the implementation of the West Oakland Community Action Plan could result in energy impacts from implementing certain of the Strategies.

It is expected that the direct effects of the West Oakland Community Action Plan would be reductions in criteria pollutant and TAC emissions through the implementation of Strategies. Of the Strategies that the District would implement, a number of them would apply to existing sources and could include replacing diesel engines, controlling emissions from existing facilities, and adding filtration systems to existing buildings. Other strategies would encourage the use of zero emissions mobile sources (trucks, buses, locomotives), and provide shore power for ships. Implementation of these types of Strategies would not be expected to use energy in a wasteful, inefficient or unnecessary manner, or conflict with an energy conservation plan. However, Strategies that encourage zero emission mobile sources would increase electricity use, potentially requiring additional electricity or energy infrastructure. As such, the potential energy impacts from the implementation of Strategies that may increase electricity usage under

[3] https://www.oaklandca.gov/documents/energy-and-climate-action-plan-ecap-1

the West Oakland Community Action Plan are analyzed herein. The Strategies that may have potential energy impacts are summarized in Table 3.3-2.

TABLE 3.3-2

Strategies with Potential Energy Impacts

Strategy #	Description	Control Methodology	Potential Energy Impacts
14	Loans to install energy storage systems to replace stationary emission sources	Electrification of sources	Increased demand for electricity
36	Financial incentives for fueling infrastructure, and for low and zero-emission equipment	Electrification of sources	Increased demand for electricity
43	Up to $7 million per year to replace autos through the Vehicle Buy Back Program and $4 million per year through the Clean Cars for All programs	Electrification of vehicles	Increased demand for electricity
44	Financial incentives to replace box and yard trucks with zero-emission trucks	Electrification of trucks	Increased demand for electricity
48	Financial incentives to replace long-haul diesel trucks with zero-emission	Electrification of trucks	Increased demand for electricity
49	Up to $1 million to purchase cleaner electric lawn/garden equipment, battery electric Transportation Refrigeration Units, and cargo-handling equipment	Electrification of equipment	Increased demand for electricity
61	Evaluate the feasibility of installing a shore power or bonnet system to capture vessel emissions at Schnitzer Steel	Use of electricity to shore power for use on marine vessels	Potential increase in electricity use

Because of the need for ever more stringent emission control regulations to achieve all ambient air quality standards, electricity is becoming more important as an energy source to reduce emissions in a number of economic sectors, especially mobile sources. With regard to some of the West Oakland Strategies, assumptions have been made regarding future electricity demand. As shown in Table 3.3-2, strategies would increase future demand for electricity to achieve the Strategies' targets of zero emissions from on-road and off-road vehicles.

As discussed in Section 3.2.4.2.2 of this EIR, increasing penetration of zero and near-zero vehicles would increase future demand for electricity in the Bay Area and other areas of California that provide electricity to the Bay Area. Potential increased electricity demand from Strategies that the Air District may implement are shown in Table 3.3-3.

TABLE 3.3-3

Estimated Electricity Increases Associated with the West Oakland Community Action Plan (GWh)

CONTROL MEASURE	2017[(a)]	2021	2023
Baseline Electricity Consumption in Alameda Co.	11.13	n/a	n/a
Strategy #61 – Installation of shore power to reduce emissions from auxiliary engine on vessels at Schnitzer Steel[(b)]	n/a	0.42	0.42
Strategy #43 – offer up to $4 million per year to replace older vehicles through the Cleaner Cars for Everyone program (estimated 40-50 vehicles)[(c)]	n/a	0.20 – 0.26	0.6 – 0.8
Total Electrical Use for Mobile Source Measures		**0.62 – 0.68**	**1.0 – 1.2**

(a) See Table 3.3-1 for electricity use in 2017.
(b) See Appendix B for electricity estimates.
(c) Based on 15,000 miles/year and 0.34 kWh/mile.

As shown in Table 3.3-3, the potential increased demand for electricity to implement Strategies in the Plan that would electrify on-road and off-road mobile sources is expected to be less than one gigawatt-hours (GWh) (0.6-0.7 GWh) in the year 2021. Assuming Strategy #43 is implemented through 2023, the increase would be approximately one GWh in 2023 (see Table 3.3-3 for further details).

Electricity to Alameda County, including West Oakland, is supplied by PG&E. PG&E has prepared an Integrated Resources Plan (IRP) that outlines how the utility will shape its future energy portfolio to meet California's clean energy goals in a reliable and cost-effect manner. As part of the IRP (PG&E, 2018), PG&E has forecasted the potential load impacts on electricity demand that would be expected to occur from increased charging of electric vehicles in the future. PG&E has estimated that meeting the state's goal of five million electric vehicles (or two million within PG&E's service territory) by 2030 would increase the current electrical demand for electric vehicles of approximately 160 GWh in 2018 to 5,982 GWh in 2030 (see Table 3.3-4). PG&E plans to add resources to supply sufficient electricity to its customers for electric vehicles as well as from population growth. Most of the increases will come for additional bioenergy, solar, and wind resources due to the RPS requirements.

TABLE 3.3-4

PG&E Energy Sales Forecast (GWh)

Description	2018	2022	2026	2030
PG&E Net Gross System Usage	87,475	102,149	109,941	116,897
Energy Efficiency	(4,147)	(8,894)	(15,930)	(22,573)
Distributed Generation	(2,614)	(13,662)	(17,243)	(20,290)
Solar-PV	(2,395)	(10,012)	(13,487)	(16,459)
Non-PV	(220)	(3,650)	(3,756)	(3,831)
Electric Vehicles	160	2,353	4,205	5,982
PG&E Net System Sales	80,774	81,946	80,973	80,016

Note: Negative numbers are reductions.
Source: PG&E, 2018

While the electricity use associated with electric vehicles is expected to increase, PG&E predicts that its overall sales in electricity would remain the same or increase slightly (up to eight percent). The expected increases in energy efficiency and solar photovoltaic production are expected to offset a majority of the growth in electric vehicles, as well as economic and population driven growth (PG&E, 2018).

The potential increase in electric vehicles under the Strategies in the West Oakland Community Action Plan are within the range of vehicles that PG&E has forecast for its service area of two million vehicles. In addition to the vehicles, electricity may also be supplied to Schnitzer Steel to power marine vessels while at berth. The electricity to power a marine vessel is estimated to be 0.42 GWh, which is a very small increase in overall electricity use (less than 0.0005 percent). Therefore, implementation of the Strategies in the West Oakland Community Action Plan is not expected to result in significant impacts to energy/electricity, over those already contemplated in the PG&E service areas.

Further, some of the Strategies in the West Oakland Community Action Plan would encourage the use of electricity to reduce emissions from mobile and stationary sources. As these Strategies would provide environmental and health benefits, the energy use associated with the Strategies would not be a wasteful, inefficient or unnecessary use of energy resources.

As discussed in Section 3.3.2.2, electricity providers are moving towards compliance with California's RPS to generate 50 percent of their electricity from renewable energy resources by 2030. Therefore, modifications to existing electricity generating facilities and new generating facilities are expected to be implemented in the near future to comply with state RPS regulations. The Strategies that would convert mobile sources to zero-emission sources would further the goals of a number of state programs and plans including:

1. Executive Order B-16-2012, which established a target of reaching 1.5 million zero-emission vehicles on California's roadways by 2025 to help meet federal air quality standards.

2. The Air District's 2017 Spare the Air/Cool the Climate Plan: A Blueprint for Clean Air and Climate Protection in the Bay Area, which included a number of transportation control measures, several of which would encourage the use of zero-emission or near zero-emission mobile sources.

3. The City of Oakland's Sustainability Programs, which encourage the replacement of heavy-duty diesel trucks.

It should also be noted that in addition to Strategies that may result in an increase in electricity, the West Oakland Community Action Plan also includes a number of measures that are aimed at energy efficiency and are expected to result in decreases in electricity use including: Strategy #70 (includes policies or grants for building energy efficiency upgrades to reduce infiltration of pollutants at sensitive receptors); and Strategy #81 (examine weatherization/energy efficiency and renewable energy services). The method in which these Strategies would be implemented is speculative and the potential energy benefits are unknown, so no electricity reduction is assumed at this time.

The West Oakland Community Action Plan is designed to reduce PM and TAC emissions and reduce exposure to TACs. The Plan has the potential to create impacts on electricity demand; however, the existing and future air quality, greenhouse gas rules and regulations, and RPS requirements are expected to minimize the need for increased electrical generation. Furthermore, electricity providers are moving towards compliance with California's RPS and generating 50 percent of their electricity from renewable energy resources by 2030. Therefore, the Plan impacts on electricity demand are less than significant.

The Strategies in the West Oakland Community Action Plan would further the existing State and local plans to encourage electrification of mobile and stationary sources, as well as increase the energy efficiency of a number of sources. Therefore, the Plan would not obstruct a state or local plan for renewable energy or energy efficiency. Instead the Plan would help to further to goals of a number of state and local plans for renewable energy and energy efficiency.

3.3.5 MITIGATION MEASURES

The potential increase in electricity associated with the West Oakland Community Action Plan is expected to be a small percentage of the existing electrical demand and is not expected to exceed the current capacity of the electric utilities in the Bay Area or create significant impacts on regional electricity supplies or on requirements for additional electricity. The Plan impacts on electricity supply are less than significant.

CEQA requires mitigation measures to be implemented to avoid or minimize any significant impacts. As no significant energy impacts have been identified, no mitigation measures to reduce or avoid energy impacts are required or proposed for the Plan.

3.3.6 CUMULATIVE ENERGY IMPACTS

In addition to evaluating whether any action the Air District may take in implementing the proposed Plan will cause significant energy impacts by itself, the EIR must also evaluate whether any District action may contribute to significant cumulative energy impacts caused by other existing and reasonably foreseeable future activities. Specifically, CEQA Guidelines Section 15064(h) requires an evaluation of whether the District's implementation of the proposed Plan will result in any "cumulatively considerable" contribution to an existing (or reasonably foreseeable future) significant energy impact. The geographical location for the cumulative analysis for electricity is the PG&E service area.

3.3.6.1 Impacts of Past, Present and Reasonably Foreseeable Future Projects

As described in Section 3.3.1, the Bay Area has sufficient electricity supplies. As discussed in Section 3.3.2.2, electricity providers are moving towards compliance with California's RPS to generate 50 percent of their electricity from renewable energy resources by 2030. Therefore, modifications to existing electricity generating facilities and new generating facilities are expected to be implemented in the near future to comply with state RPS regulations, as well as improved energy efficiency requirements. California is moving forward with a number of programs, plans, and requirements that impact energy/electricity requirements and increase energy efficiency including:

1. California Building Standards to require solar power on single-family and multi-family dwellings built in California after 2020.

2. RPS requires retail sellers of electricity to increase their procurement of eligible renewable energy resources to 33 percent renewable energy by 2020 and 50 percent by 2030.

3. Executive Order B-18-12 requires all new state buildings and major renovations beginning design after 2025 to be constructed as zero net energy facilities with an interim target for 50 percent of new facilities beginning design after 2020 to be zero net energy. The Order also encourages the use of on-site power generation (e.g., solar photovoltaic), if feasible.

4. Executive Order B-16-2012 which established a target of reaching 1.5 million zero emission vehicles on California's roadways by 2025 to help meet federal air quality standards.

5. The Air District's 2017 Spare the Air/Cool the Climate Plan: A Blueprint for Clean Air and Climate Protection in the Bay Area, which included a number of transportation control measures, several of which would encourage the use of zero emission or near zero-emission mobile sources.

6. The City of Oakland's Green Building Ordinance and Sustainable Green Building Requirements adopted mandatory green building standards for public and private developments and encourage sustainable building strategies.

7. City of Oakland's Energy and Climate Action Plan prioritizes actions the City can take to reduce energy consumption and GHG emissions, including renewable energy and energy efficiency measures to reduce vehicle miles travels by 20 percent annually, electricity consumption by 32 percent, and natural gas consumption by 14 percent.

The overall impact of these measures are expected to be a reduction in electricity use, an increase in the use of renewable energy sources, and a decrease in GHG emissions, as well as criteria pollutant emissions.

3.3.6.2 Contribution of the Proposed Project

The Plan is not expected to exceed the current capacity of the electric utilities in the Bay Area or create significant impacts on regional electricity supplies or on requirements for additional electricity. The Plan impacts on electricity supply are less than significant. Therefore, energy impacts associated with the Plan are not cumulatively significant and would not make a considerable contribution to a cumulatively significant energy impact. The Air District concludes that the Plan will not result in any significant energy impacts, individually or cumulatively, that must be addressed in this EIR.

The Strategies in the West Oakland Community Action Plan would further the existing State and local plans to encourage electrification of mobile and stationary sources, as well as increase the energy efficiency of a number of sources, providing a beneficial impact on energy resources.

CEQA requires mitigation measures to be implemented to avoid or minimize any significant impacts. As no significant cumulative energy impacts have been identified, no mitigation measures to reduce or avoid energy impacts are proposed for the Plan.

CHAPTER 3.4

GREENHOUSE GAS EMISSIONS

This page intentionally left blank.

3.4 GREENHOUSE GAS EMISSIONS

This subchapter of the EIR evaluates the potential greenhouse gas (GHG) impacts associated with implementation of the West Oakland Community Action Plan, which aims to reduce residents' exposure to diesel PM, fine particulate matter, and TACs.

As discussed in the Initial Study, in accordance with AB 617, the Community Action Plan was developed through monthly meetings with the West Oakland Steering Committee and provides strategies to reduce exposure to air pollution and related health effects in West Oakland. The Notice of Preparation and Initial Study (see Appendix A) evaluated the potential GHG impacts associated with implementation of the control strategies in the Community Action Plan. The Notice of Preparation and Initial Study determined that some control measures have the potential to require modifications to facilities that would require the generation of additional electricity to operate mobile sources, including vehicles, trucks, locomotives, and ships, which could generate additional GHG impact. This subchapter evaluates the potential GHG materials impacts that could result due to implementation of the West Oakland Community Action Plan.

3.4.1 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 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). 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 (CO_2e) basis. Diesel engines and wood-burning are key sources of black carbon in the Bay Area. It is also important to reduce emissions of "super-GHGs" (with very high global warming potential) such as methane, black carbon, and fluorinated gases, in addition to carbon dioxide. The Air Resources Board refers to these compounds as short-lived climate pollutants (SLCPs).

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.

The Air District's Clean Air Plan, *Spare the Air, Cool the Climate* (2017), provides scientific data that California and the Bay Area is already experiencing a wide range of climate change impacts, which are predicted to intensify in the future negatively affecting natural systems, infrastructure, agriculture, air quality, and human health. The Air District's data and modeling shows the following:

1. Higher temperatures produce more high ozone days
2. Higher temperatures produce more pollution from power plants and vehicles
3. Changes in air mixing and flow can increase pollution levels
4. Higher temperatures and drought are fueling wildfires
5. Climate change will have non-air quality impacts on public health:
    - Heat-Related illnesses and death will increase
    - Urban heat island impacts will grow
    - Higher temperatures will increase vector-borne diseases
    - Other public health impacts from higher temperatures include worsening of allergy seasons, asthma, and other respiratory and cardiovascular diseases.

3.4.2 ENVIRONMENTAL SETTING

There are dozens of GHGs, but a subset of six of these gases has been identified by the Kyoto Protocol (plus carbon black) as the primary agents of climate change:

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 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 3.4-1 shows atmospheric lifespan, 20-year and 100-year GWP values, and key emission sources for GHGs, which are also addressed in the 2017 Clean Air Plan.

TABLE 3.4-1

Greenhouse Gases and Global Warming Potential

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

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. In 2014, total GHG emissions in the State of California were an estimated 441.5 million metric tons of CO_2 equivalent ($MMTCO_2e$), a decrease of 3.51 $MMTCO_2e$ compared to 2010. Fuel combustion activities (including energy industries, manufacturing and construction, transportation and other sectors) accounted for approximately 82 percent of the GHGs emitted in the State. GHG emissions from transportation account for about 36 percent of the total GHG emissions in the State, followed by energy industries (e.g., electric plants) with 32 percent of the total (CARB, 2016).

Table 3.4-2 presents the GHG emission inventory by major source categories in calendar year 2015, as identified by the Air District. 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 3.4-2

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

Source Category	CO_2, CH_4, N_2O, HFC/PFC, SF6	Black Carbon	Total Emissions (CO_2e)
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, 2016

The emission inventory in Table 3.4-2 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. 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 were 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 3.4-3 shows emissions trends by major sources for the period 1990 to 2020. The long term GHG emissions trends are expected to go upwards by approximately 0.5 percent per year in the absence policy changes. Year-to-year fluctuation in emissions trends are due to variation in economic activity and the fraction of electric power generation in this region (BAAQMD, 2015).

TABLE 3.4-3

Bay Area Emission Trends by Major Sources
(Million metric Tons CO_2e)

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, 2015)

In June 2006 the City of Oakland, along with 10 other local governments in Alameda County, committed to becoming a member of Local Governments for Sustainability (ICLEI) and participating in the Alameda County Climate Protection Project. In December 2006, the City of Oakland completed their Baseline Greenhouse Gas Emissions Inventory Report to determine the community-wide levels of GHG emissions that the City of Oakland emitted in its base year (2005).

Subsequently, the City of Oakland has completed a Draft Energy and Climate Action Plan, which includes an updated analysis of community-wide emissions. As shown in Table 3.4-4, Oakland emitted approximately 3.4 million metric tons of CO_2e in 2005 from all areas sources and highway transportation sources. Of these emissions, transportation generated the most emissions (51 percent), following by building energy use (37 percent), other stationary sources (7 percent), and methane from solid waste landfills (four percent) (City of Oakland, 2014).

TABLE 3.4-4

Oakland Estimated GHG Emissions

GHG Emission Source	CO_2e (metric tons)	Percent of Total
Non-Highway Transportation	759,883	22
Highway Transportation	1,006,911	29
Mobile Sources (Port of Oakland)	211,910	6
Commercial/Industrial Electricity	320,212	9
Commercial/Industrial Natural Gas	285,365	8
Residential Electricity	150,105	4
Residential Natural Gas	346,339	10
Other Stationary Sources	226,900	7
Landfill Methane from Solid Waste	126,361	4
TOTAL:	**3,433,986**	**100**

Source: City of Oakland, 2014

3.4.3 REGULATORY SETTING

3.4.3.1 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 greenhouse gas air pollution 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 (RFS): 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 Prevention of Significant Deterioration (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 CO_2e 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_2e 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 U.S. EPA announced the Clean Power Plan. The Clean Power Plan set standards to reduce carbon dioxide emissions by 32 percent from 2005 levels by 2030. This Plan established 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. In February 2016, the U.S. Supreme Court issued a stay of this rule pending final determination on litigation challenging the rule. The Trump Administration has announced potential changes to the plan which is now known as the Affordable Clean Energy 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 area 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:

1. Reduce agency building energy intensity as measured in Btu/ft^2 by 2.5 percent annually through 2025.
2. Improve data center energy efficiency at agency buildings.
3. Ensure a minimum percentage of total building electric and thermal energy shall be from clean energy sources.

4. Improve agency water use efficiency and management (including stormwater management).
5. Improve agency fleet and vehicle efficiency and management by achieving minimum percentage GHG emission reductions.

3.4.3.2 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 (Nunez and Pavely), the California Global Warming Solutions Act of 2006, was enacted by the State of California and signed by Governor Schwarzenegger. 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 greenhouse gas 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[1]: 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, the Cal/EPA, and the CARB. According to OPR, the "Technical Advisory" offers the 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 (Pavley 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, the 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 (Perata) is the companion bill of AB 32 and was signed by Governor Schwarzenegger in September 2006. SB 1368 required the

[1]The CA Climate Change website provides a complete list of regulations https://www.climatechange.ca.gov/state/regulations.html

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)[2]: 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, the CARB, the 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 (Steinberg), 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

[2] CA climate change Executive Orders
https://www.climatechange.ca.gov/state/executive_orders.html

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, Committee on Budget and Fiscal Review) 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)[3]: 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.

Executive Order B-55-18: Under Executive Order B-55-18 the State is required to achieve carbon neutrality by 2045 and maintain on-going net negative emissions.

3.4.3.3 Local Regulations

3.4.3.3.1 Air District

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% 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

[3] A complete list of California climate change legislation with a brief description provided on the CA Climate Change website https://www.climatechange.ca.gov/state/legislation.html.

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, in 2017 the Air District approved the Clean Air Plan: *Spare the Air, Cool the Climate: A Blueprint for Clean Air and Climate Protection in the Bay Area*. The 2017 Plan identified 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.

3.4.3.3.2 City of Oakland

Numerous counties within the Bay Area have prepared and adopted Climate Action Plans including Alameda County, Contra Costa County, Marin County, San Francisco County, Sonoma County and Solano County[4]. These plans outline the county's measures and actions to reduce GHG emissions with each county's jurisdiction. Napa County addressed climate change and sustainable practices in the Conservation Element of its General Plan. In addition a number of communities (e.g., cities) have finalized and adopted community climate action plans, or are in the process of drafting climate action plans (ABAG, 2013).

City of Oakland Energy and Climate Action Plan: The Oakland Energy and Climate Action Plan (ECAP) was adopted on December 4, 2012. The purpose of the ECAP is to identify and prioritize actions the City of Oakland can take to reduce energy consumption and GHG emissions. The ECAP recommends GHG reduction actions and establishes a framework for coordinating implementation, as well as monitoring and reporting on progress.

The primary sources of Oakland's GHG emissions are transportation and land use, building energy use, and material consumption and waste. Oakland approved a preliminary GHG reduction target for the year 2020 of 36 percent below 2005 levels. The ECAP recommends over 150 actions to be implemented over a ten-year period that would enable the City of Oakland to achieve a 36 percent reduction in GHG emissions. Implementation of renewable energy and energy efficiency measures include measures to reduce vehicle miles traveled annually by 20 percent, electricity consumption by 32

[4] A complete list and map of cities and counties of climate action planning efforts provided by CARB https://coolcalifornia.arb.ca.gov/local-government

percent and natural gas consumption by 14 percent. These measures include the adoption of a green building ordinance for private development, the use of property-based financing for alternative energy systems, and advancing the use of transit. The ECAP was updated in 2018 to show the several types of updates on City's actions, but without changing the greenhouse gas reduction goals.[5]

City of Oakland Green Building Ordinance and Sustainable Green Building Requirements for Private Development: The City of Oakland adopted a Civic Green Building Ordinance in May 2005, requiring City-owned and occupied buildings to meet specific green building standards set by the U.S. Green Building Council's Leadership in Energy and Environmental Design (LEED) rating system. In October 2010, the City adopted mandatory green building standards for private development projects. The intent of the mandatory green building standards is to integrate environmentally sustainable strategies in building construction and landscapes in Oakland.

Land Use and Transportation Element: The City of Oakland General Plan Land Use and Transportation element includes a Pedestrian Master Plan and Bicycle Master Plan with a number of policies related to GHG emissions and climate change that encourages the use of public transit, encourages transit-oriented and pedestrian-oriented developments, encourages the use of alternative transportation options, and encourages infill development.

3.4.4 SIGNIFICANCE CRITERIA

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.

The Air District draft CEQA Guidelines (BAAQMD, 2017a) established a GHG threshold for air quality plans of "no net increase in emissions," which is appropriate for air quality plans because they include a mix of 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. Because the proposed project is a Community Action Plan with the goal of reducing emissions, the GHG threshold for air quality plans of "no net increase in emissions" will apply to the proposed project.

[5] https://www.oaklandca.gov/documents/energy-and-climate-action-plan-ecap-1

3.4.5 EVALUATION OF GHG/CLIMATE CHANGE IMPACTS

As discussed in the Notice of Preparation and Initial Study (see Appendix A), some of these Strategies could potentially have secondary adverse impacts that could result in increased GHG emissions. For example, implementation of some of the control measures that accelerate zero-emission technologies, rely on electricity; an increase in electrical demand may result in increased electricity generation and subsequently increased GHG emissions associated with combustion and power plants. GHG emissions may increase from one emission sector as a result of these measures in order to effectively reduce overall GHG emissions from fossil fuel combustion. Therefore, this EIR evaluates whether the implementation of Strategies associated with the West Oakland Community Action Plan will result in adverse GHG impacts.

CEQA defines a "project" broadly to include "the whole of an action, which has a potential for resulting in either a direct physical change in the environment, or a reasonably foreseeable indirect physical change in the environment." (CEQA Guidelines, §15378(a) It is expected that the direct effects of the West Oakland Community Action Plan would be reductions in criteria pollutant and TAC emissions. However, construction equipment and activities to install air pollution control equipment, enclosures, and new infrastructure has the potential to generate GHG emission impacts, primarily from exhaust emissions. Potential secondary GHG impacts from activities that may be required under the West Oakland Community Action Plan are analyzed herein. The Strategies with potential GHG emission increases are summarized in Table 3.4-5. Those Strategies where no direct or indirect GHG emission impacts were identified, or where the impacts are unknown or considered speculative, are not discussed further in the following subsections.

CEQA Guidelines, §15064.4(a) states "the lead agency shall make a good-faith effort, based to the extent possible on scientific and factual data, to describe, calculate or estimate the amount of greenhouse gas emissions resulting from a project. A lead agency shall have discretion to determine, in the context of a particular project, whether to: (1) Quantify greenhouse gas emissions, resulting from a project; and/or (2) Rely on a qualitative analysis or performance based standards."

TABLE 3.4-5

Control Strategies to be Implemented by the Air District with Potential GHG Impacts

Strategy #	Description	Control Methodology	Potential GHG Impacts
14	Loans to install energy storage systems to replace stationary emission sources	Electrification of sources	Potential GHG emissions associated with increased demand for electricity
36	Financial incentives for fueling infrastructure, and for low and zero-emission equipment	Electrification of sources	Potential GHG emissions associated with increased demand for electricity
43	Up to $7 million per year to replace autos through the Vehicle Buy Back Program and $4 million per year through the Clean Cars for All programs	Electrification of vehicles	Potential GHG emissions associated with increased demand for electricity
44	Incentives to replace box and yard trucks with zero-emission trucks	Electrification of trucks	Potential GHG emissions associated with increased demand for electricity
48	Incentives to replace long-haul diesel trucks with zero-emission trucks	Electrification of trucks	Potential GHG emissions associated with increased demand for electricity
49	Up to $1 million to purchase cleaner electric lawn/garden equipment, battery electric Transportation Refrigeration Units, and cargo-handling equipment	Electrification of equipment	Potential GHG emissions associated with increased demand for electricity
61	Evaluate the feasibility of installing a shore power or bonnet system to capture vessel emissions at Schnitzer Steel	Use of electricity for shore power for use on marine vessels	Potential GHG emissions associated with increased demand for electricity
63	Amendments to existing District Reg 6-4 and 12-13 to reduce fugitive PM emissions from metal recycling and foundry operations	Emission Minimization Plans would be prepared and are expected to required enclosures for fugitive emission sources	Potential GHG emissions associated with construction activities

3.4.5.1 Potential GHG Impacts During Construction Activities

A few of the Strategies in the Plan have the potential to generate construction activities to install air pollution control or modify operations. It is impossible to predict at the Plan stage all of the construction activities that may be required, or how, when, or where they may be carried out. However, construction activities can be estimated for implementation of some of the Strategies.

Construction activities would result in temporary GHG emissions, although the amount generated by specific types of equipment can vary greatly as shown in Table 3.4-6. The estimated emissions for construction equipment operating on a typical eight-hour day are also provided in Table 3.4-6.

TABLE 3.4-6

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)
Bore/Drill Rigs	0.06	0.47
Cranes	0.04	0.28
Excavators	0.03	0.26
Graders	0.04	0.33
Pavers	0.03	0.23
Paving Equipment	0.02	0.20
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
Aerial Lifts	0.01	0.09
Forklifts	0.01	0.08

(1) Emission Factors from Off-Road 2011.

To calculate the potential GHG emissions associated with the construction of one enclosure, it was assumed that construction activities would take about 60 days and would require 20 workers. It is also assumed that only one enclosure would be constructed as Strategy #63 would affect one facility in West Oakland. The potential GHG emissions associated with the construction of an enclosure are summarized in Table 3.4-7.

The estimated GHG construction emission increases associated with the Plan are 75 metric tons or 3 metric tons per year amortized over 30 years. Construction emissions are temporary as construction emissions would cease following completion of construction activities.

TABLE 3.4-7

West Oakland Community Action Plan
GHG Construction Emissions Summary

Construction Emissions	CO_2e (MT)	30-Year Amortized CO2e (MT/yr)
Construction Emissions Associated with Enclosure (1)	75	3

(1) See Appendix B for detailed emission calculations.

The construction of additional electrical or hydrogen cell infrastructure would be required under several Strategies in the West Oakland Community Action Plan. The type of equipment, magnitude of any construction activities, location of the activities, etc., are currently unknown and considered to be speculative. However, additional construction activities associated with Strategies that the Air District would seek to implement are expected to be minor, such as installing electric charging stations or hydrogen fuel stations, for example, would likely be added to existing facilities (e.g., gas stations).

3.4.5.2 Potential GHG Impacts Associated with Operational Activities

The net effect of implementing the West Oakland Community Action Plan is to reduce TAC and $PM_{2.5}$ emissions as well as exposure to emissions in West Oakland. However, some control technologies have the potential to generate secondary or indirect GHG emission impacts as part of the control process.

3.4.5.2.1 GHG Emissions Associated with Truck Deliveries

Table 3.4-5 lists the Strategies that may have secondary or indirect operational GHG impacts. The installation of a bonnet system to control emissions from marine vessels at berth could include emission control equipment to control particulate matter, as well as other pollutants. Installation of a bonnet system would be expected to result in the increase in delivery trucks to support the system. It is estimated that two trucks per peak day would be required to delivery ammonia/urea, catalyst and other supplies, or about 40 truck trips per year would be required for the delivery of supplies. This amount could vary depending on the size of the bonnet system and related equipment (e.g., SCR and size of the ammonia or urea storage systems). However, the 40 trucks per year is expected to provide a conservative estimate of transportation requirements. The estimated increase in GHG emissions associated with truck deliveries to support the bonnet system would be 7 metric tons per year (see Table 3.4-8).

TABLE 3.4-8

West Oakland Community Action Plan
Potential Indirect GHG Emission Impacts Associated with Transportation Activities

Material	Trucks per year	Trip Length (roundtrip miles)	CO2e (MT/year)
Truck Deliveries to Support Bonnet System	40	100	7

(1) See Appendix B for detailed emission calculations.

3.4.5.2.2 GHG Emissions from Increased Electricity Demand

Implementing Strategies in the West Oakland Community Action Plan is expected to increase future demand for electricity in two ways. First, electricity is often used as the power source to operate various components of add-on control equipment that may be required to reduce emissions. Second, a number of Strategies may increase future demand for electricity as a result of increasing the penetration of electric on-road and off-road vehicles or replacing existing equipment with zero or near-zero equipment. Although increasing the number of on-road and off-road electric vehicles in West Oakland, it is anticipated that the increased electricity generation emissions would be offset by emission reductions from removing gasoline and diesel-powered vehicles from district fleets.

Electricity Demand Impacts from Operating Control Equipment

There are a variety of different types of air pollution control equipment, such as SCRs and filters/baghouses associated with a bonnet system, that may require additional electricity. In the case of the bonnet system, it would be expected that the air pollution control equipment would be placed on a barge because of lack of space along the waterfront within and adjacent to the Port. Since the bonnet system would be placed on a barge, it would be operated through the diesel engines on the barge so that no increase in electricity from a public utility company would be required.

Strategy #70 that would place filtration devices on schools, day care facilities, hospitals, apartments, and homes, could place additional electricity demands to operate heaters or air conditioners. Increased demand for electrical energy may require generation of additional electricity, which in turn could result in increased GHG emissions associated with electricity generation. However, installation of high-energy efficient systems could help offset any electricity increases. Details on the filtration systems, ventilation systems, fan motors, where they would be located, how many would be installed, and other details are currently unknown. Therefore, the potential increase in electricity and the related GHG impacts are currently difficult to estimate and considered to be speculative.

Electricity Demand Impacts from Electric Vehicles

Because of the need for ever more stringent emission control regulations to achieve all ambient air quality standards and climate protection goals, electricity is becoming more important as an energy source to reduce emissions in a number of economic sectors, especially mobile sources. With regard to some of the West Oakland Strategies, assumptions have been made regarding future electricity demand. For example, several Strategies would increase future demand for electricity to achieve the control measures' targets of zero emissions from on-road and off-road vehicles. The following information summarizes the Strategies in the Plan that could result in an increase in future electricity demand:

1. Strategy #14: Provide financial incentives for local businesses to install energy storage systems (e.g., batteries, fuel cells) to replace stationary sources of pollution (e.g., back-up generators).

2. Strategy #36: Provide financial incentives for fueling infrastructure, and for low and zero emission equipment.

3. Strategy #43: Offer up to $7 million per year to replace older autos through the Vehicle Buy Back program, and up to $4 million per year through the Clean Cars for All program to replace older autos and provide an incentive for a hybrid electric, plug-in hybrid electric, battery electric vehicle, or funding for public transit.

4. Strategy #44: Offer financial incentives to replace box and yard diesel trucks with zero emission trucks.

5. Strategy #48: Offer financial incentives to replace long-haul diesel trucks with zero emission trucks.

6. Strategy #49: Offer up to $1 million in funding incentives to pay for the purchase of cleaner equipment, including electric lawn and garden equipment, Transportation Refrigeration Units, and cargo-handling equipment.

Increasing penetration of zero and near-zero emission vehicles and electrification of stationary sources could increase future demand for electricity in the Bay Area and other areas of California that provide electricity to the Bay Area. Potential increased electricity demand from West Oakland Community Action Plan Strategies that increase the penetration of zero on-road and off-road mobile sources are shown in Table 3.3-3 in Section 3.3 – Energy. Estimates of the potential increase in electricity use are provided where sufficient information is available to estimate the number of pieces of equipment or vehicles that would be required under each of the Strategies. In most cases, that information is not available and cannot be determined at this time. The potential increase in future demand for electricity to provide energy for on-road and off-road mobile sources associated with the West Oakland Plan is expected to be less than one gigawatt-hours (GWh) in the year 2021. Assuming Strategy #43 is implemented through 2023, the increase would be approximately one GWh in 2023 (see Table 3.3-3 for further details).

As discussed in Section 3.3.4, PG&E has forecasted the potential load impacts on electricity demand that would be expected to occur from increased charging of electric vehicles in the future as part of its IRP. PG&E has estimated that meeting the goal of five million electric vehicles in California (or two million within PG&E's service territory by 2030) would increase the current electrical use for electric vehicles from about 160 GWh in 2018 to 2,353 GWh in 2022, to 4,205 GWh in 2026, and 5,982 GWh in 2030 (PG&E, 2018). PG&E plans to add bioenergy, solar and wind resources (due to RPS requirements) to supply sufficient electricity to its customers.

As part of the IRP process, PG&E is required to provide estimates of GHG emissions from the plants that it operates. PG&E has forecasted its 2030 GHG emissions to be 4.72 to 4.59 million metric tons (MMT) which is below the required benchmark level of 5.50 to 6.06 MMT (PG&E, 2018). The electrification of motor vehicles and other commercial and industrial equipment would greatly reduce fossil fuel usage (see Table 3.2-15).

The potential increase in electric vehicles under the Strategies in the West Oakland Community Action Plan is within the range of vehicles that PG&E has forecast for its service area of two million vehicles. PG&E is expected to meet its forecast GHG benchmarks by 2030. Therefore, implementation of the Strategies is not expected to result in an increase in GHG emissions over those already contemplated in the PG&E service areas.

3.4.5.3 Potential GHG Emission Reduction Benefits

The estimated emission benefits from implementation of several Strategies that the Air District may implement in the West Oakland Community Action Plan are presented in Table 3.2-17. For some of the potential Strategies, emission reductions are unknown at this time. For particular sources or pollutants, there may be uncertainties associated with emission estimates or the level of control and emission reductions achievable, and further study and evaluation would be required to develop more detailed estimates.

Under Strategy #43, the District is proposing up to $7 million per year to replace older autos through the Vehicle Buy Back program and up to $4 million per year through the Cleaner Cars for All program to replace older vehicles and provide an incentive for zero emission vehicles. The number of vehicles that may be retired in West Oakland under this Strategy is up to 60-80 per year for the Vehicle Buy Back Program and up to 40-50 per year for the Cleaner Cars for All program.

TABLE 3.4-9

West Oakland Community Action Plan Predicted GHG Emission Reductions

Construction Emissions(1)	CO_2e (MT/year)
#43 Vehicle Buy Back Program	-142 to -189
#43 Cleaner Cars for All Program	-55 to -69
#61 Shore Power to Schnitzer Steel	-18
Total GHG Emission Reductions (tons/yr)	-215 to -276

(1) See Appendix B for detailed emission calculations.

Emission reduction estimates have also been provided for providing shore power to Schnitzer Steel as it is expected to be the better choice for reducing emissions from ships at berth. The emission calculations assume that ships would be at dock 100 days per year and assumes the total emissions are 80 percent from shore power and 20 percent for the auxiliary engine (see Appendix B for detailed emission calculations).

As summarized in Table 3.4-9, GHG emissions reductions are expected to range from 182 to 276 metric tons per year, providing a beneficial impact on GHG emissions.

3.4.5.4 Summary of Operational Emission Impacts

Implementation of the Strategies in the West Oakland Community Action Plan by the Air District would result in a minor increase in emissions associated with the potential delivery of materials to supply air emission control systems that would be implemented as part of the Plan. The potential GHG emission increases are expected to be offset with emission decreases that would occur due to implementation of the Plan (see Table 3.4-10).

Based on the evaluation of the Strategies that the Air District would implement as part of the West Oakland Community Action Plan, the emission reductions associated with the Plan are expected to exceed the potential air quality increases and there would be no net GHG emission increases. Therefore, GHG impacts would be less than significant.

TABLE 3.4-10

West Oakland Community Action Plan Predicted GHG Emission Reductions

Construction Emissions(1)	CO_2e (MT)
Potential GHG Emissions Increases	
Construction Emissions	3
Truck Deliveries to Support Bonnet System	7
Potential GHG Emission Increases	10
Potential GHG Emission Reductions	
Project GHG Emission Reductions	-215 to -276
Total GHG Emission Reductions (tons/yr)	-205 to -246 -162 to -256

(1) See Appendix B for detailed emission calculations.

The West Oakland Community Action is predicted to result in a decrease in fuel use of 28,272 to 36,754 gallons per year, providing both GHG emission reductions (see Table 3.4-9), as well as criteria pollutant emissions reductions.

3.4.6 CONCLUSION ON GHG EMISSION IMPACTS AND CUMULATIVE IMPACTS

Table 3.4-10 provides a summary of the estimated GHG emission increases associated with implementation of the West Oakland Community Action Plan, along with the estimated decreases in GHG emissions associated with the Plan. As shown in Table 3.4-10, the emission reductions from the Plan are expected to outweigh the potential secondary GHG emissions and result in a beneficial impact on climate change. The GHG analysis is cumulative in nature. Since the Plan is a GHG emission benefit, the GHG emissions impacts from the Plan are not cumulatively considerable.

3.4.6.1 Impacts of Past, Present and Reasonably Foreseeable Future Projects

As discussed in Section 3.4.3.2, electricity providers are moving towards compliance with California's RPS to generate 50 percent of their electricity from renewable energy resources by 2030 and reduce GHG emissions. Therefore, modifications to existing electricity generating facilities and new generating facilities are expected to be implemented in the near future to comply with state RPS regulations, as well as improved energy efficiency requirements. California is moving forward with a number of programs, plans, and requirements that impact energy requirements and increase energy efficiency, with the overall goal of decreasing GHG emissions and its impact on climate change including the following:

1. AB 32: Global Warming Solutions Act (Nunez and Pavley 2006) lays out a program to inventory and reduce GHG emissions in California by three percent

per year from 2015 to 2020 in California from industrial facilities, including power generating facilities.

2. SB 375 (Steinberg 2008) aligns regional transportation planning efforts, regional GHG reduction targets, and land use and housing allocation aimed at reducing GHGs emitted by passenger cars and light trucks California. The GHG emission reduction targets in this program are to reduce per capita GHG emissions by seven percent below 2005 levels by 2020 and 15 percent below 2005 levels by 2035.

3. California Building Standards require solar power on single-family and multi-family dwellings built in California after 2020.

4. RPS requires retail sellers of electricity to increase their procurement of eligible renewable energy resources to 33 percent renewable energy by 2020 and 50 percent by 2030.

5. Executive Order B-18-12 requires all new state buildings and major renovations beginning design after 2025 to be constructed as zero net energy facilities with an interim target for 50 percent of new facilities beginning design after 2020 to be zero net energy. The Order also encourages the use of on-site power generation (e.g., solar photovoltaic), if feasible.

6. Executive Order B-16-2012 which established a target of reaching 1.5 million zero-emission vehicles on California's roadways by 2025 to help meet federal air quality standards.

7. The Air District's 2017 *Spare the Air/Cool the Climate Plan: A Blueprint for Clean Air and Climate Protection in the Bay Area* identified 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.

8. Air District Climate Action Work Program outlines the District's priorities to reduce GHG emissions 80 percent below 1990 levels by 2050.

9. The City of Oakland's Green Building Ordinance and Sustainable Green Building Requirements adopted mandatory green building standards for public and private developments and encourage sustainable building strategies.

10. City of Oakland's Energy and Climate Action Plan prioritizes actions the City can take to reduce energy consumption and GHG emissions, including renewable energy and energy efficiency measures to achieve a 36 percent reduction in GHG emissions by 2020.

11. City of Oakland General Plan Land Use and Transportation element includes a Pedestrian Master Plan and Bicycle Master Plan with a number of policies related to GHG emissions and climate change that encourages the use of public transit, encourages transit-oriented and pedestrian-oriented developments, encourages the use of alternative transportation operations, and encourages infill development.

The overall impact of these measures are expected to be a reduction in electricity use, an increase in the use of renewable energy sources, and a decrease in GHG emissions, as well as criteria pollutant emissions.

3.4.6.2 Contribution of the Proposed Project

CEQA Guidelines, §15064.4(b): "In determining the significance of a project's greenhouse gas emissions, the lead agency should focus its analysis on the reasonably foreseeable incremental contribution of the project's emissions to the effects of climate change."

The emission reductions from the Plan are expected to reduce greenhouse gas emissions compared to the existing environmental setting, outweigh the potential secondary GHG emissions, comply with existing regulations, implement reductions, and provide beneficial impacts on climate change and human health. The GHG analysis is cumulative in nature. Since the Plan is a GHG emission benefit, the GHG emissions impacts from the Plan are not cumulatively considerable.

CHAPTER 3.5

HAZARDS AND HAZARDOUS MATERIALS

This page intentionally left blank.

3.5 HAZARDS AND HAZARDOUS MATERIALS

This subchapter of the EIR evaluates the potential hazards and hazardous material impacts associated with implementation of the West Oakland Community Action Plan, which aims to reduce residents exposure to diesel PM, fine particulate matter, and TACs.

As discussed in the Initial Study, in accordance with AB 617, the Community Action Plan was developed through monthly meetings with the West Oakland Steering Committee and provides strategies to reduce exposure to air pollution and related health effects in West Oakland. The Notice of Preparation and Initial Study (see Appendix A) evaluated the potential hazard and hazardous materials impacts associated with implementation of the Strategies in the Community Action Plan. The Notice of Preparation and Initial Study determined that some Strategies have the potential to create direct or indirect hazard impacts. For example, control devices may increase the hazards or releases at industrial facilities due to the increased use of hazardous materials in air pollution control equipment, as well as hazards associated with energy-generating facilities. This subchapter evaluates the potential hazards and hazardous materials impacts that could result due to implementation of the West Oakland Community Action Plan.

3.5.1 ENVIRONMENTAL SETTING

3.5.1.1 Contaminated Sites

West Oakland was one of the first industrial locations in the San Francisco Bay Area, later became a center for defense related industries, and continues to be a major transportation hub and industrial area. Over the years, many transportation and industrial uses have relocated or closed and many of the industrial properties have been abandoned and left contaminated (City of Oakland, 2014).

West Oakland currently contains a mix of industrial, commercial, residential, and transportation uses. Industrial uses are often located adjacent to or near residential and other sensitive land uses, such as schools and parks. Many ongoing industrial operations use, store, and/or transport hazardous materials, which potentially pose a hazard to human health and the environment through releases that contaminate soil or groundwater.

In California, regulatory databases listing hazardous materials sites provided by numerous federal, state, and local agencies are consolidated in the “Cortese List” pursuant to Government Code Section 65962.5. The Cortese List is located on the California Environmental Protection Agency’s website and is a compilation of the following lists:

1. The list of Hazardous Waste and Substances sites from the California Department of Toxic Substances Control (DTSC) “EnviroStor” database;

2. The list of Leaking Underground Storage Tank Sites (LUSTs) from the California Water Resources Control Board’s (WRCB) “Geotracker” database;

3. The list of solid waste disposal sites identified by the WRCB with waste constituents above hazardous waste levels outside the waste management unit; and

4. The list of hazardous waste facilities subject to corrective action pursuant to Section 25187.5 of the Health and Safety Code, identified by DTSC.

The Alameda County Department of Environmental Health (ACDEH) maintains a list of sites for which it is the administrative agency responsible for coordination and enforcement of local, state, and federal hazardous materials management and environmental protection programs, as recognized by the California Department of Toxics Substances Control.

Regulatory databases contain relatively current information about environmental cases involving suspected or confirmed releases of hazardous materials to the subsurface soil or groundwater. The status of each environmental case can be active (ongoing investigations or remediation), closed (remediation or cleanup completed and approved by the regulatory agency), or unknown. The information and status of identified sites changes as characterization, cleanup and monitoring of contamination occurs. Sites are typically closed once it has been demonstrated that existing or intended site uses combined with the levels of identified contamination present no significant risk to human health or the environment (City of Oakland, 2014).

Within West Oakland, there are a total of 123 reported environmental cases. Nearly 65% of these reported cases have been closed by the respective oversight agencies. Of those cases that remain open, remediation efforts are still needed before new development can occur. Within those closed case sites, the level of prior clean-up efforts may vary and may be appropriate only for commercial or industrial uses, may have deed restrictions preventing sensitive uses, or may stipulate additional agency oversight should development be considered.

The majority of reported environmental cases within West Oakland are attributed to leaking underground storage tanks, most of which contain, or used to contain petroleum products, e.g., gasoline. However, there are also a number of reported cases of more complex and hazardous incidents where toxic chemicals have been spilled or released into the soils and groundwater, resulting in potential health and safety concerns for residents and employees of the area.

One property within West Oakland is on the National Priorities List (NPL) of federal Superfund sites, for former AMCO Chemical facility located at 141 3rd Street, one block south of the West Oakland BART station. From 1960s to 1989, the site was owned and operated by AMCO as a chemical distribution facility. Investigative studies on the site found that the primary source of contamination to groundwater, soil, and soil gas is from tetrachloroethene (PCE), trichloroethene (TCE), other volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs), pesticides, and dioxins/furans, floating on groundwater beneath the former AMCO site. The highest concentrations of contaminants were observed in the central and south-central areas of the site, corresponding with the known locations of former chemical storage units and buried distribution piping. Concrete pavement at the site and off-site locations provides a protective layer that isolates on-site workers from the contaminated soil, soil gas and groundwater contamination underneath the site (City of Oakland, 2014). Active remediation continues at the AMCO facility.

3.5.1.2 Hazardous Materials

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 Bay Area 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.

3.5.1.3 Hazardous Materials Incidents

Emergency incidents involving hazardous materials can threaten human life, damage property, contaminate the environment, require the evacuation of nearby populations and impact transportation routes. Potential hazards include accidental releases of toxic/hazardous materials, as well as fires and explosions. 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. 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 and are summarized in yearly incident summary reports (PHMSA, 2018).

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 the California Governor's Office of Emergency Services (Cal OES). While information on accidental releases is reported to Cal OES, Cal OES no longer conducts statistical evaluations of the releases.

Table 3.5-1 provides a summary of the reported hazardous materials incidents in the nine counties within the Bay Area. In 2018, there were a total of 1,396 incidents reported in the nine counties in the Bay Area (see Table 3.5-1), with the most incidents (380) reported in Alameda County, followed by Contra Costa County (245).

TABLE 3.5-1

Hazardous Materials Incidents 2018 by County

County	Reported Incidents
Alameda	380
Contra Costa	245
Marin	82
Napa	39
San Francisco	74
San Mateo	129
Santa Clara	185
Solano	106
Sonoma	156
Total No. of Reported Incidents	**1,396**

Source: OES, 2019

The location of the spills varies (see Table 3.5-2). In the nine counties that comprise the Air District, hazardous materials incidents during transportation, in residential areas, and at waterways were the most common locations, respectively, for hazardous materials incidents. About 15 percent of the hazardous materials incidents that occurred within California occurred within the nine counties that comprise the Bay Area, with spills in waterways being the most common (24 percent), followed by residential areas (15 percent).

TABLE 3.5-2

Hazardous Materials Incidents 2018

Spill Site	Bay Area	Statewide	Percent of State Total
Waterways	206	860	24%
Transportation	407	2,831	14%
Industrial	65	486	13%
Commercial	212	1,463	14%
Residential	192	1,290	15%
Utilities	26	208	13%
Military	4	57	7%
Other	155	1,251	12%
Total	1,267	8,446	15%

Source: OES, 2019

3.5.1.4 Potential Hazards Associated with Air Pollution Control Equipment

The District has evaluated the hazards associated with the implementation of rules in previous air plans (2017 Clean Air Plan) and proposed District rules.[1] 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 scrubbers, bag filters, SCRs, vapor recovery systems, 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 hazardous materials are evaluated herein.

3.5.1.5 Electric Vehicles

Electric and hybrid vehicles (hybrids) both use electricity as part of their fuel system. Electric vehicles rely purely on electric power stored in batteries. Hybrids also use batteries as part of their fuel supply; however, hybrids supplement their electric demand by using gasoline engines to generate either mechanical or electric power on demand. Since gasoline is a conventional

[1] http://www.baaqmd.gov/plans-and-climate/air-quality-plans/current-plans

fuel, any difference in hazards associated with hybrid vehicles would be from the batteries. The most common battery technologies used in modern electric vehicles and hybrids are nickel-metal hydride (NiMH) and lithium ion (Li-ion) (AFDC, 2016). A number of state-back incentives have pushed the sales of zero emission vehicles, including CARB's State Implementation Plan and the Air District's 2017 Air Plan. Electric and plug-in hybrid vehicles now represent 7.8 percent of all new car sales in California, (CARB, 2019).

3.5.2 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.

3.5.2.1 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.

3.5.2.1.1 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.

3.5.2.1.2 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.

3.5.2.1.3 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.

3.5.2.1.4 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.

3.5.2.1.5 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 the 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).

Health Hazards Guidance: In addition to fire impacts, health hazards can also be generated due to exposure of chemicals present in products, by-products and wastes. 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 the American Conference of Governmental Industrial Hygienists (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.

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.

3.5.2.2 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 in California. 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:

1. California Health and Safety Code §25270.7, §25270.8, and §25507;
2. California Vehicle Code §23112.5;
3. California Public Utilities Code §7673 (General Orders #22-B, 161);
4. California Government Code §51018 and §8670.25.5(a);
5. California Water Code §13271 and §13272; and,
6. 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 Risk Management Plans (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 transportation) 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. The CalARP regulations were last updated in October 2017 to include new Program 4 requirements.

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 0ground Spill Prevention Control and Countermeasures (SPCC) Program; Hazardous Materials Release Response Plans and Inventories (business plans); the CalARP Program; the Underground Storage Tank 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.

AB 440: On October 5, 2013, the Governor signed AB 440 (Gatto), giving cities, counties, and some housing authorities the authority to compel cleanup of contaminated properties. AB 440 gives municipalities the right to obtain environmental information from property owners, the authority to compel cleanup of properties, cost recovery for cleanup efforts, and immunity from liability during the cleanup process. AB 440 expands on the previous Polanco Act provisions by applying to properties with the presence or perceived presence of a release of hazardous materials that contributes to the vacancies, abandonment of property, or reduction in property utilization.

3.5.2.3 Local Regulations

San Francisco Bay Regional Water Quality Control Board: West Oakland is located within the jurisdiction of the San Francisco Bay Water Board. The Water Board provides for protection of State waters in accordance with the Porter-Cologne Water Quality Act. The Water Board can act as lead agency to provide oversight for sites where the quality of groundwater or surface waters is threatened, and has authority to require investigations and remedial actions.

Alameda County Department of Environmental Health[2] and Oakland Fire Department[3]: The Alameda County Department of Environmental Health and Oakland Fire Department are the primary agencies responsible for local enforcement of State and federal regulations pertaining to hazardous materials management and oversight of hazardous materials investigations and remediation in Alameda County.

Urban Land Redevelopment Program: The Oakland Urban Land Redevelopment Program is a collaborative effort by the City of Oakland and the principal agencies charged with enforcing environmental regulations, including DTSC, the Regional Water Board, and Alameda County Department of Environmental Health, to facilitate the cleanup and redevelopment of contaminated properties in Oakland. The program is coordinated by the City and is specific to Oakland sites. The Program clarifies environmental investigation requirements and establishes Oakland-specific, risk-based corrective action standards for qualifying sites. Implementation of this program is intended to provide assurance that human health and environmental resources will be protected without needlessly delaying future construction and development projects.

Oakland Hazardous Materials Regulation: the City of Oakland assumed authority and responsibility for the administration and enforcement of the unified hazardous waste and hazardous materials management program within the city. The Office of Emergency Services is the administering agency for the CUPA program in Oakland. The CUPA programs include coordination of the local hazardous waste generator programs, underground and above ground storage tank management, and investigations of leaking underground storage tank sites. The Oakland Fire Department also implements the City of Oakland Hazardous Materials Assessment and Reporting Program, which requires notification of hazardous materials storage, use and handling, and an assessment as to whether this storage, use and handling would cause a public health hazard.

City of Oakland Hazardous Materials Release Response Plan Program: The Oakland Fire Department requires any business that handles more than a threshold quantity of a hazardous material (varies by chemical) to develop and submit to the Oakland Fire Department a Hazardous Materials Business Plan. The Hazardous Materials Business Plan must include and address facility information including the inventory of hazardous materials, facility map, location of

[2] https://www.acgov.org/aceh/hazard/
[3] http://www2.oaklandnet.com/government/o/OFD/s/HAZMAT/index.htm

hazardous materials storage, emergency response plans and procedures, training, release reporting, underground storage tanks, and hazardous waste treatment/tiered permitting.

In addition to the above, the City of Oakland's General Plan Safety Element has policies relevant to the management of hazards and hazardous materials, e.g., minimize the potential risks to human and environmental health and safety associated with the past and present use, handling, storage and disposal of hazardous materials; and reduces the public's exposure to toxic air contaminants.

3.5.3 SIGNIFICANCE CRITERIA

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

1. Non-compliance with any applicable design code or regulation.
2. Non-conformance to National Fire Protection Association standards.
3. 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.
4. Exposure to hazardous chemicals in concentrations equal to or greater than the Emergency Response Planning Guideline (ERPG) 2 levels.
5. Be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, would it create a significant hazard to the public or the environment.
6. Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school.

3.5.4 EVALUATION OF HAZARDS AND HAZARDOUS MATERIALS IMPACTS

As discussed previously, the Notice of Preparation and Initial Study (see Appendix A) found that the implementation of the West Oakland Community Action Plan could result in potential hazard impacts from implementing certain of the Strategies.

It is expected that the direct effects of the West Oakland Community Action Plan would be reductions in criteria pollutant and TAC emissions through the implementation of Strategies. Of the strategies that the District would implement, a number of them would apply to existing sources and could include replacing diesel engines; several strategies could result in new hazards associated with modifications to energy-generating facilities, as well as the increased use of hazardous materials associated with air pollution control equipment.[4] This subchapter evaluates the potential impacts on hazards and hazardous materials that could result in future projects due to implementation of the West Oakland Community Action Plan. The potential hazard impacts associated with the Strategies that the Air District would implement are summarized in Table 3.5-3.

[4] It should be noted that the Initial Study indicated that modifications to refineries associated with the production of alternative fuels could also generate potentially significant hazard impacts. Since the preparation of the NOP/IS, the Strategies that would have encouraged the use of alternative fuels have been modified to encourage the use of zero emission vehicles, eliminating the potential impacts of alternative fuels.

TABLE 3.5-3

Control Strategy with Potential Hazard/Hazardous Materials Impacts

Strategy #	Description	Control Methodology	Potential Hazard Impacts
47	Incentives to support the development of hydrogen fuel cell infrastructure.	Reduce emissions through the development of hydrogen cells	Potential hazards due to increased use of hydrogen.
61	District works with Schnitzer Steel to study the feasibility of installing a shore power or bonnet system to capture vessel emissions	Bonnet system could include SCR and filtration system or shore power could be used.	Potential hazards associated with the use of ammonia to control NOx emissions from vessels.

3.5.4.1 Ammonia Use in SCRs

Proposed Strategy 61 may require or encourage the use of a bonnet system that could include an SCR to reduce NOx emissions. Ammonia or urea is used to react with the 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 and other applications 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 Office of Emergency Services' regulations implementing the CalARP requirements, both anhydrous and aqueous ammonia (20 percent or greater) are regulated under the California Code of Regulations Title 19, Section 2770.5.

The Schnitzer Steel facility is located in an industrial area adjacent to the Port, so that a SCR unit would be located within an industrial area. However, the use and storage of anhydrous ammonia could 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. In the event of a release, anhydrous ammonia would 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 Emergency Response Planning Guidelines-2 (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 the 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. Anhydrous ammonia and aqueous ammonia (greater than 10 percent) is considered a hazardous material under 49 CFR 172 (§172.101).

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.

In the unlikely event that a tanker truck would rupture and release the entire contents of anhydrous ammonia, the 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. There are federal, State and local agencies with jurisdiction over hazardous materials and waste that are responsible for ensuring that hazardous materials and waste handling activities are conducted in accordance with applicable laws and regulations. While compliance with these laws and regulations will minimize the chance of an accidental release of anhydrous ammonia, the potential will still exist that an unplanned release could occur. 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 high concentrations of ammonia resulting in potentially significant impacts.

3.5.4.2 Hydrogen Fuel Cells

Hydrogen is the simplest, lightest and most plentiful element in the universe. In its normal gaseous state, hydrogen is colorless, odorless, tasteless, non-toxic and burns invisibly. Most hydrogen is made from natural gas through a process known as steam reforming. Reforming separates hydrogen from hydrocarbons by adding heat. Hydrogen can also be produced from a variety of sources including water and biomass. Hydrogen can be used as a combustion fuel or in fuel cell vehicles to produce electricity to power electric motors. Most automakers have placed fuel cell electric vehicles (FCEVs) with customers, or plan to introduce FCEVs to the early commercial market soon. Currently, approximately 6,800 FCEVs have been sold or leased in California and 31 fuel cell buses are in operation. The Alameda-Contra Costa Transit District (AC Transit) operates buses that use hydrogen fuel cell technologies, with bus engines that have operated over 25,000 hours (California Fuel Cell Partnership, 2019).

The generation and distribution of hydrogen as a consumer product is also still in developmental stages. Currently there are 39 hydrogen refueling stations within California, with 11 of those in the Bay Area. An additional 10 fueling stations are under construction or undergoing planning/approval within the Bay Area, including one in Oakland (California Fuel Cell Partnership, 2019). The closest existing or planned hydrogen fueling stations within or adjacent to Oakland include the following:

1. 1172 45th St. Emeryville, CA 94608

2. 1250 University Avenue, Berkeley, CA 94702 (has planning approval, expected to be completed in 2019).
3. 350 Grand Avenue, Oakland, CA 92610 (under construction, expected to be completed in 2019)

Most of the refueling stations depend on bulk liquid hydrogen delivery; however, a few hydrogen gas pipeline stations and on-site steam reformer stations exist. The physical hazards associated with bulk liquid transport and storage are similar to liquid natural gas, as they are both cryogenic liquids. The physical hazards associated with pipeline and steam reformer stations are similar to compressed natural gas, as they are both compressed gases. In general, the fire hazards associated with hydrogen spills or leaks are higher than conventional fuels. This is due to the wide flammability range and low ignition energy of hydrogen. However, hydrogen tanks are built to more rigorous standards than conventional fuel tanks, which reduces the likelihood of spills or leaks.

The main additional hazard associated with the use of hydrogen versus conventional fuels is the difficulty in seeing hydrogen fires and potentiality of a large fire stemming from a release in the case of an accident (e.g., a tanker truck accident). Another potentially significant hazard is a release of hydrogen in an enclosed space (e.g., garage or vehicle maintenance facility).

Compared with diesel fuel and gasoline, the following can be stated about hydrogen:

1. Diesel fuel and gasoline are toxic to the skin and lungs and hydrogen is non-toxic and non-reactive, so if released, it does not present a health hazard to humans.

2. Diesel fuel gasoline vapors are heavier than air (for specific gravity of air = 1, gasoline is 3.4, diesel fuel is 4.0) while hydrogen is 14 times lighter than air. If released, hydrogen will quickly dissipate into the atmosphere.

3. Hydrogen has an extremely low ignition energy requirement; about 20 microjoules can ignite hydrogen/air, which is about 10 times less than what is required to ignite a gasoline/air mixture (PNL, 2004).

4. Hydrogen is clear, odorless, and tasteless. It burns with an extremely hot, but nonluminous flame which is difficult to see. The flame of burning hydrogen has few warning properties.

5. Hydrogen has an unusually large flammability range and can form ignitable mixtures between four and 75 percent by volume in air. Given confinement and good mixing, hydrogen can be detonated over the range of 18 to 59 percent by volume in air.

Hydrogen is non-toxic and disperses more readily in air than gasoline or diesel. Based upon the preceding information, health hazards associated with hydrogen are approximately equivalent or less when compared to conventional fuels. Furthermore, hydrogen is limited in its use as a transportation fuel.

While hydrogen fuel cell technology is promising, its use in the future is dependent on many things (cost-effectiveness of the technology, availability of hydrogen, etc.), so that the extent to which it may be used in the future to replace petroleum fuels is currently unknown. Hydrogen technologies are controlled through codes and standards in a manner similar to other fuels. Key standards include the National Fire Protection Association (NFPA) 2 Hydrogen Technologies Code, and the NFPA 853 Standard for Fuel Cell Energy Systems. Table 3.5-4 provides an overview of key regulations, codes and standards related to hydrogen infrastructure safety.

The regulations, codes and standards related to hydrogen infrastructure safety address all key aspects of system design, construction, operation, and maintenance. Compliance with these requirements should reduce the potential hazards associated with hydrogen use to a safe level. Further, the hazards associated with hydrogen are not expected to be higher than the hazards associated with the use of conventional gasoline or diesel. For these reasons, the use of hydrogen fuel is not expected to generate significant adverse hazard impacts.

3.5.4.3 Construction Activities at Contaminated Sites

West Oakland contains numerous sites which are included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 (the Cortese List). The Cortese list identifies public drinking water wells with detectable levels of contamination, hazardous substances sites selected for remedial action, sites with known toxic material identified through the abandoned site assessment program, sites with underground storage tanks having a reportable release, and all solid waste disposal facilities from which there is a known migration. Implementation of the Strategies could require future construction activities within sites that have been contaminated.

Any required treatment, remediation or disposal of contaminated soil or groundwater would be required to comply with all local, State, and federal regulations. A Remedial Action Plan, Soil Management Plan, and Groundwater Management Plan, if applicable, would be required to address issues such as dust suppression, protection of surface waters and storm waters, noise attenuation, etc. The Air District may also impose specific requirements to protect ambient air quality from dust, hydrocarbon vapors, or other airborne contaminants that may be released during site remediation activities. A Risk Management Plan and a Site Health and Safety Plan in conformance with federal and CalOSHA regulations could also be required. These plans would include identification of chemicals of concern, potential hazards, personal protection clothing and devices, and emergency response procedures as well as required fencing, dust control or other site control measures needed during excavation to protect the health and safety of workers and the public. OSHA requirements mandate an initial training course and subsequent annual training for workers at contaminated sites. Site-specific training may also be required. For transportation of hazardous materials for disposal, the application would be required to follow state and federal regulations for manifesting the wastes, using licensed waste haulers, and disposing of the materials at a permitted disposal or recycling facility.

The District's Strategies (Table 3.5-3) to provide incentives to support the development of hydrogen fuel cell infrastructure and conduct feasibility studies with Schnitzer Steel will have less than significant impact. Any potential future projects by other agencies will be required to conduct environmental analysis per CEQA. With compliance with the required local, State and federal regulations for treatment, remediation or disposal of contaminated soil or groundwater, the hazards to the public or the environment from hazardous materials at sites required for implementation of the Strategies in the West Oakland Community Action Plan, are expected to be less than significant.

TABLE 3.5-4

Overview of Regulations, Codes, and Standards Related to Hydrogen Infrastructure and Safety

Regulations, Codes, Standards	Description
Federal Regulations	
OSHA Regulations 29 CFR 1910 Subpart H	Safe storage, use and handling of hydrogen in the workplace
DOT Regulations 49 CFR 171-179	Safe transport of hydrogen in commerce
Hydrogen Technologies Specific Fire Codes and Standards	
NFPA 2 Hydrogen Technologies	Comprehensive code for hydrogen technologies constructed of extract material from documents such as NFPA 55 and 853 and original material
NFPA 55 Compressed Gas and Cryogenic Fluids Code	Comprehensive gas safety code that addresses flammable gases as a class of hazardous materials and also contains hydrogen-specific requirements
NFPA 853	Covers installation of all commercial fuel cells
Hydrogen Technologies Component, Performance, and Installation Standards	
American Society of Mechanical Engineers (ASME) B31.3 and B31.12 Piping and Pipelines	Piping design and installation codes that also cover material selection
ASME Boiler and Pressure Vessel Code	Addresses design of steel alloy and composite for pressure vessels
Compressed Gas Association (GSA) S Series	Addresses requires for pressure relief devices for containers
CGA H Series	Addresses requirements for components and systems
Underwriters Laboratory	Addresses requirements for sensors
Canadian Standards Association FC1	Addresses requirements for stationary fuel cells
Society of Automotive Engineers	Addresses dispensing and dispenser nozzles

Source: Rivkin, et al., 2015

3.5.5 MITIGATION MEASURES

The hazards and hazardous material impacts are expected to be less than significant if future projects are implemented for the following reasons:

1. Ammonia Use in SCRs: The use of ammonia in SCRs could be potentially significant due to implementation of the Strategies. However, the use of aqueous ammonia at concentrations less than 20 percent by volume is expected to reduce hazard impacts associated with ammonia use to less than significant.

2. Hydrogen Fuel Cells: The hazard impacts associated with the increased use of hydrogen are expected to be less than significant, since compliance with the numerous regulations, codes and standards would minimize potential impacts.

3. Contaminated Sites: The hazards associated with construction activities at contaminated sites are expected to be less than significant, as compliance with existing local, State and federal regulations would minimize the potential impacts to less than significant.

As no significant impacts were identified, no mitigation measures are required.

3.5.6 CUMULATIVE IMPACTS

As concluded in the above hazards and hazardous materials analysis, implementation of the Strategies in the West Oakland Community Action Plan, is not expected to cause or contribute to significant adverse hazard impacts. 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.

In addition to evaluating whether any action the District may take in implementing the proposed West Oakland Community Action Plan will cause significant hazards and hazardous materials impacts by itself, the EIR must also evaluate whether any District action may contribute to significant cumulative impacts caused by other existing and reasonably foreseeable future activities. Specifically, CEQA Guidelines Section 15064(h) requires an evaluation of whether the District's implementation of the proposed Plan will result in any "cumulatively considerable" contribution to an existing (or reasonably foreseeable future) significant hazards and hazardous materials impact. The geographical location for the cumulative analysis is the jurisdictional boundaries of the Air District, 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.

3.5.6.1 Impacts of Past, Present and Reasonably Foreseeable Future Projects

As described in Section 3.5.1, a number of hazards currently exist in the Bay Area including those associated with the transport and use of hazardous materials and hazardous waste. A total of 1,396 hazardous materials incidents in the Bay Area were report to OES in 2018, with 308 in Alameda County. In addition, there are currently hazards from existing contaminated sites, and the use of air pollution control equipment and related materials required for their use including ammonia and caustic materials. Further, the use of fossil fuels results in potential impacts associated with fire, explosions, and accidental releases during fuel transport, storage, dispensing and use. Alternative fuels such as hydrogen, natural gas and propane may also result in hazards. However, the hazards associated with alternative fuels are generally less than or equivalent to hazards associated with the use of fossil fuels.

3.5.6.2 Contribution of the Proposed Project

The West Oakland Community Action Plan is not expected to introduce any new hazards into West Oakland and, as analyzed in Section 3.5.4 above, the impacts on hazards and hazardous materials are less than significant. Further, the Plan is expected to result in minimal hazard impacts and the reduction in use of fossil fuels is expected to reduce hazards associated with its use. Therefore, hazards and hazardous materials impacts associated with the Plan are not cumulatively significant and would not make a considerable contribution to cumulatively significant hazards/hazardous materials impacts. The Air District concludes that the West Oakland Community Action Plan will not result in any significant hazards or hazardous materials impacts, individually or cumulatively, that must be addressed in this Program EIR.

CEQA requires mitigation measures to be implemented to avoid or minimize any significant impacts. As no significant hazard and hazardous material impacts have been identified, no mitigation measures to reduce or avoid impacts are proposed for the West Oakland Community Action Plan.

CHAPTER 3.6

UTILITIES AND SERVICE SYSTEMS

This page intentionally left blank.

3.6 UTILITIES AND SERVICE SYSTEMS

3.6.1 INTRODUCTION

This subchapter of the EIR evaluates the potential utilities and service system impacts associated with implementation of the West Oakland Community Action Plan, which aims to reduce residents' exposure to diesel PM, fine particulate matter, and TACs.

As discussed in the Initial Study, in accordance with AB 617, the Community Action Plan was developed through monthly meetings with the West Oakland Steering Committee and provides strategies to reduce exposure to air pollution and related health effects in West Oakland. The Notice of Preparation and Initial Study (see Appendix A) evaluated the potential impacts on utilities and service systems associated with implementation of the Strategies in the Community Action Plan. The Notice of Preparation and Initial Study determined that some Strategies have the potential to generate additional solid and/or hazardous waste because of the limited landfill space. No impacts were identified on water conveyance facilities, wastewater treatment facilities, or storm water drainage facilities and these topics are not addressed further in the EIR (see Appendix A). This subchapter evaluates the potential utilities and service system impacts that could result due to implementation of the West Oakland Community Action Plan.

3.6.2 ENVIRONMENTAL SETTING

3.6.2.1 Solid Waste

Permit requirements, capacity, and surrounding land use are three of the dominant factors limiting the operations and life of landfills. Landfills are permitted by the local enforcement agencies with concurrence from California's Department of Resources Recycling and Recovery (CalRecycle). Local agencies establish the maximum amount of solid waste which can be received by a landfill each day and the operational life of a landfill. Landfills are operated by both public and private entities.

There are three primary classes of landfill sites permitted to receive varying severity of waste materials. Class I sites are facilities that can accept hazardous waste as well as municipal solid waste, construction debris, and yard waste. Class II sites may receive certain designated waste along with municipal solid waste, construction debris, and yard waste. Class III sites can only accept non-hazardous waste, e.g., solid waste construction debris, wood and yard waste, and certain non-hazardous industrial waste.

A total of 14 active landfills are located within the nine counties that make up the Bay Area, with a total capacity of over 42,600 tons per day (see Table 3.6-1).

TABLE 3.6-1

Number of Class III Landfills Located within the Bay Area and Related Landfill Capacity(1)

County	Number of Landfills	Capacity (tons/day)
Alameda	2	13,668
Contra Costa	2	5,000
Marin	1	2,300
Napa	1	600
San Francisco	0	0
San Mateo	1	3,598
Santa Clara	4	8,250
Solano	2	6,730
Sonoma	1	2,500
TOTAL	**14**	**42,646**

(1) Source: CalRecycle, 2019b

Two active landfills are located within Alameda County with a total capacity of 13,668 tons per day (see Table 3.6-2).

TABLE 3.6-2

Class III Landfills Located within Alameda County and Related Landfill Capacity

Landfill	Total Tons Disposed 2017(1)	Total Tons ADC(2) 2017(1)	Permitted Tons/Day(3)	Remaining Permitted Capacity (million cubic yards)(3)	Estimated Year of Closure(3)
Altamont Landfill & Resource Recovery	971,262	186,194	11,150	65.4	2025
Vasco Road Sanitary Landfill	260,706	208,848	2,518	7.4	2022
TOTAL	**1,231,969**	**395,042**	**13,668**	**72.8**	**N/A**

1. CalRecycle, 2019a Multi-year Countywide Destination Summary
2. Alternative Daily Cover (ADC) means cover material other than earthen material placed on the surface of the active face of a municipal solid waste landfill at the end of each operating day to control vectors, fires, odors, blowing litter, and scavenging.
3. CalRecycle, 2019b Solid Waste Information System (SWIS) Facility/Site Search

The Altamont Landfill is a Subtitle D-approved landfill providing non-hazardous Class II and Class III disposal and one of the largest landfill operations in Northern California. It accepts for disposal all non-hazardous municipal solid wastes (MSW), non-hazardous industrial and special wastes, de-watered wastewater treatment plant sludge (biosolids), treated auto shredder wastes, contaminated soils, liquids for solidification, asbestos wastes, yard waste for composting, and construction/demolition debris. Altamont receives approximately 500 trucks per day, contributing to both re-use and disposal flow rates at the landfill. These include transfer trucks, large-end dump trucks, and residential and commercial MSW collection vehicles from throughout the surrounding communities and the Bay Area.

The Altamont Landfill hosts an on-site landfill gas to liquefied natural gas (LNG) plant, windmills, and two solar landfill gas-powered turbines. The facility maintains one of the industry's first renewable landfill gas to electricity plants, generating enough electricity to power the equivalent of 8,000 homes annually as well as the daily operation of its landfill gas to liquefied natural gas (LNG) plant. The LNG plant can produce up to 13,000 gallons of natural gas daily, powering up to 300 waste collection vehicles per day. The landfill is estimated to be able to operate its renewable energy plants for another 30 years without adding any more organic waste to it. In addition to the landfill gas electricity plant, the Altamont Landfill has designated space for 248 windmills producing approximately 20 megawatts annually and two solar landfill gas-powered turbines producing 3.3 megawatts each. Finally, the landfill is exploring power production fueled by methane gas from the landfill's natural decomposition process.

The Vasco Road Landfill is a 246-acre Class III municipal refuse disposal site and accepts residential, commercial, municipal garbage, but also recyclables and green waste. A portion of the landfill is Subtitle D-approved and meets the criteria and design requirements for a Class II waste management unit. It accepts for disposal construction materials and debris, metals, organics, paper, plastic, and tires.

3.6.2.2 Hazardous Waste

Hazardous material, as defined in 40 CFR 261.20 and 22 CCR Article 9, is disposed of in Class I landfills. California has enacted strict legislation for regulating Class I landfills. The California Health and Safety Code requires Class I landfills to be equipped with liners, a leachate collection and removal system, and a ground water monitoring system.

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. There are three operating hazardous waste disposal facilities in California but none are located within the Bay Area: The Kettleman Hills Hazardous Waste Facility in Kings County, the Buttonwillow Landfill in Kern County, and the Westmorland Chemical Waste Facility in Imperial County.

The Kettleman Hills Hazardous Waste Facility has been in operation for more than 30 years and is located on 1,600 acres approximately halfway between San Francisco and Los Angeles in Kings County. The site is operated by Waste Management and is permitted to dispose of or treat and store hazardous waste from all over California. The facility accepts almost all solid, semi-solid, and liquid hazardous waste. However, the Kettleman Hills landfill is not permitted to accept biological agents or infectious wastes, regulated radioactive materials, or compressed gases and explosives.

The Kettleman Hill hazardous waste facility was permitted to increase its capacity by about five million cubic yards in May of 2014 (DTSC, 2019a), therefore, the facility has a capacity of about five million cubic yards. CWM has also applied to the U.S. EPA to both renew and modify its existing permits to allow for the expansion of the landfill. The expansion would provide another 12-14 years of life.

The Buttonwillow Facility has been in operation since 1982 and is located on 320 acres in the unincorporated community of Buttonwillow in Kern County. The site is operated by Clean Harbors Environmental Services and is fully permitted to manage a large number of RCRA hazardous wastes, California hazardous waste, and non-hazardous waste for stabilization treatment, solidification, and landfill. Typical waste streams include contaminated soils, hazardous waste for treatment of metals, plating waste, and hazardous and non-hazardous liquids and the facility can accept in excess of 200 loads of waste per day. The permitted capacity at the Buttonwillow landfill is in excess of 10 million cubic. Clean Harbors is currently receiving waste and expected to continue to receive waste for an additional 70 years (Clean Harbors, 2015).

The Westmorland Chemical Waste Facility has been in operation since 1980 and is located on 640 acres in the city of Westmorland in Imperial County. The site is operated by Clean Harbors Environmental Services and is fully permitted to manage a wide variety of regulated materials including RCRA hazardous waste, NORM waste from geothermal operations, Animal and Plant Health Inspection Service (APHIS) soils, and California-regulated waste materials. The facility has a design capacity of five million cubic yards and an annual receiving capacity of 440,000 cubic yards of waste.

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; Laidlaw Environmental Services located in Lake Point, Utah; Envirosafe Services, in Grandview, Idaho; Chemical Waste Management, Inc. in Arlington, Oregon, and Laidlaw Environmental Services in Deer Trail, Colorado.

The most common types of hazardous waste generated in Alameda County include contaminated soils from site remediation efforts, asbestos-containing waste, organic solids, inorganic solid waste, oil/water separation sludge, and waste/mixed oils (see Table 3.6-3). Not all hazardous wastes generated are disposed of in a hazardous waste facility or incinerator. Many of the wastes generated, including waste oil, are recycled.

TABLE 3.6-3

Hazardous Waste Generation in the Alameda County 2017
(tons per year)[1]

Waste Name	Tons/year
Contaminated Soils From Site Clean-Up	61,600
Asbestos-Containing Waste	9,983
Other Organic Solids	6,218
Other Inorganic Solid Waste	5,602
Oil/Water Separation Sludge	4,575
Waste Oil And Mixed Oil	4,489
Unspecified Organic Liquid Mixture	3,486
Unspecified Oil-Containing Waste	2,209
Blank / Unknown	2,239
Liquids Ph<=2 with Metals	1,399
Unspecified Sludge Waste	1,395
Baghouse Waste	1,344
Household Wastes	1,037
Off-Spec, Aged, Or Surplus Organics	979
Aq Sol (2 < Ph < 12.5) With Organic Residues < 10%	879
Aq Sol With Metals(Smaller Than Restricted Levels)	831
Aq Sol (2 < Ph < 12.5) W Org Residues >= 10%	830
Unspecified Aqueous Solution (2 < Ph < 12.5)	808
Oxygenated Solvents	766
Unspecified Solvent Mixture	714
Liquids Ph<=2	701
Unspecified Alkaline Solution	520
Polychlorinated Biphenyls & Materials	431
Liquids With Halogenated Organic Comp >= 1000 Mg/L	402
Alkaline Solution (Ph>=12.5) W/O Metals	382
Liquids With Nickel >= 134 Mg/L	357
Off-Spec, Aged, Or Surplus Inorganics	342
Solids/Sludges With Halogenated Organic Comp >= 1,000mg/Kg	301
Other Empty Containers >= 30 Gallons	218
Laboratory Waste Chemicals	211
Fly Ash, Bottom Ash, And Retort Ash	201
Other Spent Catalyst	185
Metal Dust And Machining Waste	152
Hydrocarbon Solvents	141
Latex Waste	94
Pharmaceutical Waste	89
Polymeric Resin Waste	81
Alkaline Solution (Ph>=12.5) W/ Metals	71
Liquids With Chromium (Vi) >= 500 Mg/L	55
Tank Bottom Waste	44

TABLE 3.6-3 (cont.)

Waste Name	Tons/year
Liquids With Cyanides >= 1000 Mg/L	37
Aq Sol 2 < Ph < 12.5 with Reactive Anions	36
Empty Containers < 30 Gallons	32
Adhesives	31
Liquids With PCBs >= 50 Mg/L	31
Metal Sludge	30
Organic Liquids (Nonsolvents) W Halogens	28
Detergent And Soap	13
Organic Liquids With Metals	12
Photochemicals / Photoprocessing Waste	12
Gas Scrubber Waste	11
Liquids With Cadmium >= 100 Mg/L	9
Liquids With Mercury >= 20 Mg/L	8
Organic Solids With Halogens	7
Halogenated Solvents	7
Pesticides/Pesticide Production Waste	6
Paint Sludge	5
Other Still Bottom Waste	4
Organic Monomer Waste	2
Sewage Sludge	2
Liquids With Lead >= 500 Mg/L	2
Biological Waste (Food Processing, Etc.)	1
Pesticide Rinsewater	1
Liquids With Arsenic >= 500 Mg/L	1
Liquids With Selenium >= 100 Mg/L	1
Totals	**114,451**

Source: DTSC, 2019b

(1) Waste names and totals are reported verbatim, rounded to the nearest ton.

3.6.3 REGULATORY SETTING

3.6.3.1 Federal Regulations

The U.S. EPA is the primary federal agency charged with protecting human health from pollution and with safeguarding the natural environment: air, water, and land. Since 1970, Congress has enacted numerous environmental laws including the Resource Conservation and Recovery Act (RCRA), CERCLA, and TSCA. 40 CFR, Part 258 Subtitle D of the RCRA establishes minimum location standards for siting municipal solid waste landfills. Because California laws and regulations governing the approval of solid waste landfills meet the requirements of Subtitle D, the U.S. EPA delegated the enforcement responsibility to the State of California.

Hazardous material, as defined in 40 CFR Part 261.20 and 22 CCR Article 9, is required to be disposed of in Class I landfills. California has enacted strict legislation for regulating Class I landfills. The California Health and Safety Code requires Class I landfills to be equipped with liners, a leachate collection and removal system, and a ground water monitoring system.

The Resource Conservation and Recovery Act (RCRA) gives the U.S. EPA the authority to control hazardous waste from the "cradle-to-grave." This includes the generation, transportation, treatment, storage, and disposal of hazardous waste by "large-quantity generators" (1,000 kilograms/month or more). Under RCRA regulations, hazardous wastes must be tracked from the time of generation to the point of disposal. At a minimum, each generator of hazardous waste must register and obtain a hazardous waste activity identification number. If hazardous wastes are stored for more than 90 days or treated or disposed at a facility, any treatment, storage, or disposal unit must be permitted under RCRA. Additionally, all hazardous waste transporters are required to be permitted and must have an identification number. RCRA allows individual states to develop their own program for the regulation of hazardous waste as long as it is at least as stringent as RCRA. In California, the U.S. EPA has delegated RCRA enforcement to the State of California.

The Hazardous Materials Transportation Act (HMTA) is the federal legislation regulating the trucks that transport hazardous wastes. The primary regulatory authorities are the U.S. Department of Transportation (DOT), the Federal Highway Administration (FHWA), and the Federal Railroad Administration (FRA). The HMTA requires that carriers report accidental releases of hazardous materials to the Department of Transportation at the earliest practicable moment (49 CFR Subchapter C, Part 171).

3.6.3.2 State Regulations

California Integrated Waste Management Act (AB 939): The California Integrated Waste Management Act of 1989 (AB 939) (Sher) was enacted to reduce dependence on landfills as the primary means of solid waste disposal and to ensure an effective and coordinated approach to safe management of solid waste generated with California. AB 939 established a hierarchy of waste management practices that include: (1) source reduction; (2) recycling (or reuse) and composting; (3) transformation; and (4) environmentally safe transformation/land disposal. AB 939 required disposal of waste by local jurisdictions be cut by 25 percent by 1995 and by 50 percent by 2000.

The Act requires the preparation of a Countywide Integrated Waste Management Plan (CIWMP), including a Siting Element that demonstrates a remaining landfill disposal capacity of at least 15 years to serve all jurisdictions in the county. The Countywide Siting Elements includes a combination of strategies to demonstrate adequate capacity, that may include existing, proposed, and tentative landfills or expansion; increased diversion efforts; and the export of solid waste for disposal. A Source Reduction and

Recycling Element (SRE), a Household Hazardous Waste Element, and Facility Element are also required as part of the CIWMP.

California Solid Waste Reuse and Recycling Act (CSWRRA, AB 2176). In 1991, the California Solid Waste Reuse and Recycling Act (CSWRRA) was enacted to assist local jurisdictions in accomplishing the goals set for in AB 939. AB 2176 (Montanez 2004) requires that any development projects that have submitted an application for a building permit must also include adequate and accessible areas for the collection and loading of recyclable materials.

Title 27, California Code of Regulations: CalRecycle (formerly known as the California Integrated Waste Management Board (CIWMB)) has numerous responsibilities in implementing the federal and state regulations summarized above. CalRecycle is the state agency responsible for permitting, enforcing and monitoring solid waste landfills, transfer stations, material recovery facilities (MRFs), and composting facilities within California. Permitted facilities are issued Solid Waste Facility Permits (SWFPs) by CalRecycle. CalRecycle also certifies and appoints Local Enforcement Agencies (LEAs), county or city agencies which monitor and enforce compliance with the provisions of SWFPs. CalRecycle is also responsible for monitoring implementation of AB 939 by the cities and counties.

Solid Waste Diversion Rule (AB 341): In 2011, AB 341 (Chesbro), directed CalRecycle to develop and adopt regulations to mandate commercial recycling. In 2012, the final regulation was approved and a policy goal declared that not less than 75 percent of solid waste generated be source reduced, recycled, or composted by the year 2020.

Prohibition on Local Disposal Limits (AB 845): AB 845 (Ma 2012) prohibits an ordinance enacted by a city or county from otherwise restricting or limiting the importation of solid waste into a privately owned solid waste facility in that city or county based on place of origin.

Engineered Municipal Solid Waste (AB 1126): AB 1126 (Gordon 2013) was signed in September 28, 2013, and defines the terms “engineered municipal solid waste (EMSW) conversion” and “EMSW facility.” AB 1126 stipulates that solid waste processed through an EMSW conversion facility would be consider disposal, and the energy generated by such a facility would not be considered renewable.

Reducing GHG Emissions in California (AB 32): As part of the California Global Warming Solutions Act of 2006, CARB was directed to adopt a Scoping Plan by 2009, which lays out initial measures needed to meet the 2020 target of reducing GHG emissions back to 1990 levels. The First Update to the Scoping Plan was released in 2014 stated that CARB and CalRecycle will work to eliminate landfill disposal of organic materials, a major source of GHG (methane).

Organic State Laws (AB 1594 and 1826): On September 28, 2014, Governor Brown signed two bills into law that are intended to substantially reduce the amount of organic waste that is disposed in California landfills. AB 1594 (Williams 2014) states that for the purposes of complying with the waste diversion mandates of AB 939, beginning January 1, 2020, the use of green waste will be considered disposal and not recycling. A jurisdiction must include information on how it intends to address compliance with the waste diversion mandates of AB 939, beginning August 1, 2018. Jurisdictions which are not able to comply with AB 939 will be required to identify and address barriers to recycling green material, if sufficient capacity at organics waste recycling facilities is not available. AB 1826 (Chesbro 2014) requires jurisdictions to implement an organic waste recycling program for business that would include outreach, education, and monitoring of affected businesses by January 1, 2016.

Conversion Technology (SB 498): Governor Brown signed into law SB498 (Lara) on September 28, 2014, that requires 50 percent diversion of solid waste, of which 10 percent can come from transformation or biomass conversion. State law formerly limited "biomass conversion" to only the controlled combustion of organic materials, such as wood, lawn, and garden clippings, agricultural waste, leaves, tree pruning, and non-recyclable producing electricity or heat. SB498 expanded the definition of biomass conversion to include non-combustion thermal conversion technologies. By doing so, SB498 allows for the cleaner and more efficient non-combustion conversion technologies to be used to convert biomass into fuels and products in addition to heat and/or electricity.

RCRA: Authority for the statewide administration and enforcement of RCRA rests with the California Environmental Protection Agency's (Cal/EPA) Department of Toxic Substances Control (DTSC). While the DTSC has primary State responsibility in regulating the generation, transfer, storage and disposal of hazardous materials, DTSC may further delegate enforcement authority to local jurisdictions. In addition, the DTSC is responsible and/or provides oversight for contamination cleanup, and administers state-wide hazardous waste reduction programs. DTSC operates programs to accomplish the following: (1) deal with the aftermath of improper hazardous waste management by overseeing site cleanups; (2) prevent releases of hazardous waste by ensuring that those who generate, handle, transport, store, and dispose of wastes do so properly; and (3) evaluate soil, water, and air samples taken at sites. The DTSC conducts annual inspections of hazardous waste facilities. Other inspections can occur on an as-needed basis.

The Hazardous Waste Control Act (HWCA) created the State hazardous waste management program, which is similar to but more stringent than the federal RCRA program. The act is implemented by regulations contained in Title 26 of the CCR, which describes the following required aspects for the proper management of hazardous waste: identification and classification; generation and transportation; design and permitting of recycling, treatment, storage, and disposal facilities; treatment standards; operation of facilities and staff training; and closure of facilities and liability requirements. These regulations list more than 800 materials that may be hazardous and establish criteria for identifying, packaging, and disposing of such waste. Under the HWCA and Title 26, the generator of hazardous waste must complete a manifest that accompanies the waste from generator to transporter to the ultimate disposal location. Copies of the manifest must be filed with DTSC.

Hazardous Waste Source Reduction and Management Review Act of 1989: The Act requires generators of 12,000 kilograms/year of typical/operational hazardous waste to conduct an evaluation of their waste streams every four years and to select and implement viable source reduction alternatives. This Act does not apply to non-typical hazardous waste (such as asbestos and polychlorinated biphenyls).

3.6.3.3 Local Regulations

Alameda County Waste Reduction and Recycling Initiative (Measure D): In addition to AB 939, the 1990 voter Initiative Measure D (Alameda County Waste Reduction and Recycling Initiative) mandates all cities in Alameda County to divert 75 percent of their solid waste from landfills by the year 2020.

City of Oakland Waste Reduction and Recycling Plan: Oakland Municipal Code Chapter 15.34 requires building permit applications for new construction, demolition, or alterations (with a valuation of $50,000 or greater) to be accompanied by an approved Waste Reduction and Recycling Plan (WRRP). The WRRP is required to document the ways that the applicant will reduce the quantity of construction and demolition debris disposed at landfills by 65 percent or more. The City does not approve building permits for projects until the WRRP is approved.

City of Oakland Zero Waste Strategic Plan: The City of Oakland adopted a Zero Waste Goal in March 2004, and developed the Zero Waste Strategic Plan in November 2006. The main strategies outlined in the plan include: (1) expand and improve local and regional recycling and composting; (2) develop and adopt new rules and incentives to reduce waste disposal; (3) preserve land for sustainable development and green industry infrastructure; (4) advocate for manufacturer responsibility for produced waste, ban problem materials; and (5) educate, promote, and advocate for a Zero Waste Sustainability Agenda.

3.6.4 SIGNIFICANCE CRITERIA

The impacts to utilities/service systems will be considered significant if any of the following criteria are met:

> The generation and disposal of hazardous and non-hazardous waste exceeds the capacity of designated landfills.

3.6.5 EVALUTION OF UTILITIES AND SERVICE SYSTEM IMPACTS

As discussed previously, the Notice of Preparation and Initial Study (see Appendix A) found that the implementation of the West Oakland Community Action Plan could result in potential solid waste impacts from implementing certain of the Strategies.

It is expected that the direct effects of the West Oakland Community Action Plan would be reductions in criteria pollutant and TAC emissions through the implementation of Strategies. Of the strategies that the District would implement, a number of them could result in the generation of solid waste. Replacing diesel engines with new engines and encouraging the use of zero emissions mobile sources could generate additional waste as old equipment would be taken out of service. This subchapter evaluates the potential impacts on utilities and service systems (specifically solid and hazardous waste impacts) that could result due to implementation of the West Oakland Community Action Plan. The potential solid waste impacts are summarized in Table 3.6-4.

TABLE 3.6-4

Control Strategy with Potential Solid Waste Impacts

Strategy #	Description	Control Methodology	Potential Solid Waste Impacts
61	District works with Schnitzer Steel to study the feasibility of installing a shore power or bonnet system to capture vessel emissions	Bonnet system could include SCR and filtration system or shore power could be used.	Potential waste impacts associated with disposal of catalysts/filters.
70	Develop a program for energy efficient upgrades that may include high efficiency filtration systems	Use of air filtration systems rated MERV 13 or higher	Spent filters
Various Measures (14, 36, 43, 44, 45, 46, 47, 48, 49, 65)	The District investigates the conversion of sources from conventional to zero emission sources or higher Tier engines.	Replace old equipment with new equipment.	Could result in the disposal of older equipment including engines, cars, trucks, tug/barge engines, locomotive engines, lawn/garden equipment, and standby engines.

3.6.5.1 Potential Solid Waste Impacts due to Air Pollution Control Technologies

Construction activities associated with installing air pollution control equipment could generate solid waste due to demolition and site preparation/grading/excavating. Specifically, demolition activities could generate demolition waste while site preparation, grading, and excavating could uncover contaminated soils since the facilities affected by the Plan that may require additional air pollution control equipment are located in existing industrial or commercial areas. For example, construction activities to install power at Schnitzer Steel under Control Strategy 61 and the construction of enclosures under Control Strategy 63 could potentially encounter contaminated soil. Excavated soil, which if it is found to be contaminated, would need to be characterized, treated, and disposed of offsite in accordance with applicable regulations. Where appropriate, the soil can be recycled if it is considered or classified as non-hazardous waste or it can be disposed of at a landfill that accepts non-hazardous waste. Otherwise, the material will need to be disposed of at a hazardous waste facility.

Solid or hazardous wastes that may be generated from construction-related activities would consist primarily of materials from the demolition of any equipment, buildings, or possibly hardscaped (asphalt, pavement, etc.). Construction-related waste would be disposed of at a Class II (industrial) or Class III (municipal) landfill. There are 14 Class III landfills within the Bay Area. Based on a search of the Cal Recycle's Solid Waste Information System (SWIS), the landfills that accept solid waste in the Bay Area have a combined disposal capacity of over 42,600 tons, which is expected to be sufficient capacity to handle the one-time waste that may be generated from construction activities.

Proposed Strategies may have potential impacts on solid waste due to the addition of pollution control equipment that may need disposal and replacement (e.g., Strategy #61 – Schnitzer Steel, and Strategy #70 – addition of filtration systems on existing buildings). Strategies such as #61 that study the feasibility and provide funding (#70), is difficult to quantify the number of facilities that would employ these types of equipment, the rate of disposal necessary to maintain the equipment, type of waste generated by the equipment (i.e., hazardous or non-hazardous) and the timing by which these technologies would come into use. Future projects would provide further environmental analysis per CEQA.

Particulate Filters

Under Strategy #61, Schnitzer Steel could implement a bonnet system to capture emissions from ships while at dock. Bonnet systems generally include a filtration system (e.g., baghouse or electrostatic precipitator) to remove particulate matter from the ship exhaust. Strategy #70 would use air filtration systems on schools, day care facilities, hospitals, apartments and homes in West Oakland to reduce exposure to air pollutants. While it is speculative to identify the number of facilities and the quantity of equipment that would utilize particulate filters, the quantity of particulate matter collected on filters is expected to be small. It is difficult to quantify the number of facilities that would employ this type of equipment, the rate of disposal necessary to maintain the equipment, type of waste generated by the equipment (i.e., hazardous or non-hazardous) and the timing by which these technologies would come into use.

Filters collect particulate emissions from stationary and mobile sources of particulate emissions. This type of filtration control equipment can effectively remove particulate matter, including heavy metals, asbestos, as well as other toxic and nontoxic compounds. The particulate filter system consists of a filter positioned in the exhaust stream designed to collect a significant fraction of the particulate matter emissions while allowing the exhaust gases to pass through the system and are effective in removing particulate matter (including diesel particulate matter) from exhaust gases. Polytetrafluoroethylene (PTFE) membranes or High Efficiency Particulate Air (HEPA) filters can increase a system's removal efficiency up to 99.9 percent. In general, as particulate size decreases, the surface area to volume ratio increases, thus, increasing the capacity of these filters to adsorb smaller particles (including hazardous materials). An increase in the use of membranes and filters may result in an incremental increase in solid waste requiring disposal in landfills over what would be produced if the West Oakland Plan were not adopted. In some cases, waste generated will be hazardous (e.g., the collection of toxic emissions). The increase in the amount of waste generated from the use of filters and the collection of additional particulate matter are expected to be small, because filtration control equipment is already used in practice or required by existing rules, especially for stationary sources. The incremental amount of material collected by filters is expected to be small. The overall benefit will be filters to collect particulate emissions from stationary and mobile sources, which will reduce exposure in West Oakland.

Filters and the associated waste that are considered solid waste (i.e., not hazardous) could be disposed of at a number of landfills in northern California. The permitted capacity of the landfills in the Bay Area is over 42,600 tons per day (see Table 3.6-1) and have sufficient capacity to handle the small increase in waste.

There are no hazardous waste landfills within the Bay Area. Hazardous waste can be transported to permitted facilities both within and outside of California. Hazardous waste is expected to be transported to Clean Harbors in Buttonwillow, California. The permitted capacity at the Buttonwillow landfill is in excess of 10 million cubic yards so it would have sufficient capacity to handle the small amounts of waste that could be generated by filters/baghouses (Clean Harbors, 2015). The nearest out-of-state hazardous waste landfills are U.S. Ecology, Inc., located in Beatty, Nevada and Clean Harbors in Grassy Mountain, Utah. 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 is currently receiving waste and expected to continue to receive waste for an additional 70 years (Clean Harbors, 2015). Therefore, the potential impacts of the use of additional filtration equipment on solid/hazardous waste generation are less than significant, and will provide overall health benefits

Selective Catalytic Reduction

Control Strategy 61 (use of the bonnet system at Schnitzer Steel) could require the installation of a new SCR system. The catalyst in SCR beds generally uses various ceramic materials to carry oxide or precious metals to aid in the capture and conversion of NOx into N_2 and water in exhaust streams. SCRs require periodic regeneration or replacement of the catalyst bed. Regeneration of catalyst is preferred, due to the cost of new catalyst, however, if the catalyst cannot be regenerated, metals used in the catalyst can be recovered. These metals could then be recycled and the remaining material would most likely need to be disposed of at a landfill.

If the catalyst is not hazardous, jurisdiction for its disposal then shifts to local agencies such as regional water quality control boards or county environmental agencies. The Regional Water Quality Control Board has indicated that if a spent catalyst is not considered a hazardous waste, it would probably be considered a Designated Waste. A Designated Waste is characterized as a non-hazardous waste consisting of, or containing pollutants that, under ambient environmental conditions, could be released at concentrations in excess of applicable water objectives, or which could cause degradation of the waters of the state. The type of landfill that the material is disposed at will depend upon its final waste designation. The use of SCRs is expected to be limited to one bonnet system at Schnitzer Steel so that its use is not expected to be wide-spread. Due to the regeneration of catalysts used in SCRs and the fact that this technology is not expected to be widely used because of cost, no significant impacts on waste disposal are expected The District's feasibility study with Schnitzer Steel of installing a shore-power or bonnet system to capture and abate vessel emissions at the West Oakland facility by 2021 will not have significant impacts.

3.6.5.2 Early Retirement of Equipment

Control Strategy 49 would include incentives to retire old equipment and purchase cleaner equipment, such as electric lawn and garden equipment, battery electric transportation refrigeration units, and cargo handling equipment. Also, Strategies in the West Oakland Community Action Plan could incentivize the early retirement of vehicles (cars, trucks, tugs and barge engines, locomotive engines, and stationary/stand by engines).

Approximately 80 percent of a retired vehicle can be recycled and reused in another capacity. Batteries, catalytic converters, tires, and other recoverable materials (e.g., metal components) are removed and the rest of the vehicle is shredded. The shredded material is then sent for recovery of metal content. Therefore, the amount of solid waste landfilled as a result of the proposed measures would be smaller than the size of the vehicle. Additionally, there are a limited number of vehicles that can be scrapped per year. These vehicles would be scrapped in the near future, regardless of the Strategies as they are older vehicles. Some equipment, e.g., trucks, locomotives engines and stationary engines can be sent to other locations for use, e.g., outside of California or to other countries. The same is true for lawn care equipment and cargo handling equipment. New equipment would replace older equipment. If the equipment has reached the end of its useful life, it would be scrapped. However, if it has not reached the end of its life, it would be expected to be used in other locations. Therefore, the Strategies would not necessarily result in an increase in the generation of waste, rather they would result in an earlier generation of the waste. Engines, if not relocated to another area, would likely be scrapped for their metal content and not put into landfills. Based on the above, the increase in solid waste is expected to be accounted for within CalRecycle's permitted capacity of the landfills within the Bay Area of about 42,600 tons per day so that no significant impacts would be expected.

The California Integrated Waste Management Act of 1989 (AB 939) requires cities and counties in California to reduce the amount of solid waste disposed in landfills by 25 percent by 1995 and by 50 percent by 2000, through source reduction, recycling and composting activities. More recently, as part of the California Global Warming Solutions Act of 2006, an update to the Scoping Plan was developed that stated that CARB and CalRecycle will work to eliminate landfill disposal of organic materials, a major source of GHG (methane) emissions. In addition, SB 498 was signed into law in 2014 that requires 50 percent diversion of solid waste and encouraged the use of non-combustion thermal conversion technologies. As discussed above the increase in solid waste that is expected to be diverted to a landfill is small and many of the waste streams are recyclable. The District's Strategy #49 to provide grant incentives up to $1 million dollars for replacing cleaner equipment in West Oakland by 2021 will not have significant impacts.

3.6.5.3 Spent Batteries from Zero-Emission Vehicles

While the West Oakland Community Action Plan would encourage electrification of mobile sources, the Air District is not responsible for implementation of these Strategies that incentivize the use of zero-emission vehicles (assumed to be electric vehicles) and are expected to reduce the use of conventional vehicles and trucks within California and the Bay Area. Conventional vehicles use lead acid batteries; therefore, a reduction in the use of conventional vehicles would lead to a reduction in use of lead-acid batteries. Lead-acid batteries have a three to five year life, which is much less than the life of the vehicle so that the batteries need to be replaced every so often. Electric vehicles and hybrid batteries last a much longer time than lead-acid batteries. Most of the batteries in electric vehicles have warranties for 10 years or 150,000 miles. Toyota has reported that its battery packs have lasted for more than 180,000 miles in testing. A large number of Ford Escape Hybrid and Toyota Prius taxicabs in New York and San Francisco have logged over 200,000 miles on their original battery packs (Edmunds, 2014). Therefore, electric and hybrid batteries last much longer than lead-acid batteries so that an increase in the use of electric/hybrid vehicles would result in a decrease in the generation of spent lead-acid batteries that require recycling.

Batteries in hybrids are much larger than batteries in conventional vehicles. The current hybrid batteries weigh about 110 pounds and tend to be composed of nickel metal hydride (NiMH) batteries which are charged by an internal combustion engine driven generator and/or by a regenerative braking system that captures power from deceleration and braking. The recycling of hybrid battery packs is still in its infancy as there have not been many battery packs surrendered for recycling. The NiMH batteries found in hybrid vehicles are basically "zero-landfill" products, meaning that whatever cannot be recycled is typically consumed in the recycling process. The primary metals recovered during recycling are nickel, copper and iron. Some principal rare earth metals, neodymium and lanthanum, are also recovered (Edmunds, 2014). Improper disposal of NiMH batteries poses less environmental hazard than that of lead-acid or nickel-cadmium batteries because of the absence of lead and cadmium, which are considered to be toxic. Most industrial nickel is recycled, due to the relatively easy retrieval of the magnetic element from scrap using electromagnets, and due to its high value.

NiMH and lithium-ion batteries are generally recycled because the material within the batteries is valuable. Further some manufacturers offer incentives to prevent illegal disposal of the batteries. Most car manufacturers offer a program to take back used or damaged battery packs, including Toyota and Nissan (Green Car Reports, 2016). Recycling is attractive for several reasons, including supporting a closed-loop supply chain and supporting the principles of environmentalism and sustainability. A closed-loop supply chain would protect manufactures from volatility in the lithium market since approximately 70 percent of the global lithium deposits are concentrated in South America (MNTRC, 2014).

Two recycling firms have the technology to recycle NiMH and Lithium-ion batteries. One of these companies is the Belgium-based metals recycling company Umicore. Umicore is the European leader and is expanding in the U.S. The only company in North America with the capacity to recycle Lithium-ion batteries is Retriev Technologies (previously known as Toxco), which was awarded a federal grant to build and operate an advanced lithium battery recycling facility at their existing Lancaster, Ohio site (Edmunds, 2014). Retriev Technologies has been recycling lithium batteries for over 20 years.

Larger battery packs, such as hybrid and electric vehicles are manually disassembled and then fed by conveyor to an automated crusher. The crusher produces metal solids, metal-enriched liquid, and plastic fluff. The metal solids in lithium ion batteries may contain copper, aluminum and cobalt (depending on the type of battery) which can all be used as raw materials in new products. The metal-enriched liquid is solidified using filtering technology, and is sent off-site for further metal purification (Retriev Technologies, 2019).

Retriev Technologies operation uses a pyrometallurgical process to separate components in NiCad and NiMH batteries to enable the recovery of cadmium and the removal of battery separator materials. The operations produce cadmium ingots and nickel-enriched material that can be reused as a raw material in many applications, such as stainless steel production. Retriev's process has been classified by the U.S. EPA as the Best Demonstrated Available technology for cadmium recovery (Retriev Technologies, 2019).

Most battery and fuel cell technologies currently employ materials that have high economic value and, therefore, are recyclable. Additionally, both regulatory requirements and market forces require or encourage recycling. A number of federal and state regulations and requirements have been imposed that require the recycling of batteries.

Recycling of lead-acid and nickel-cadmium batteries is a well-established activity. Eighty percent of lead consumed in the United States is used to produce lead-acid batteries and the lead recovery rate from batteries is approximately 80 to 90 percent (the remainder is plastic and fluids, e.g., sulfuric acid). According to the Lead-Acid Battery Consortium, 95 to 98 percent of all battery lead is recycled.

Because most batteries from electric vehicles are recycled, it is unlikely that the increase in battery use would significantly adversely affect landfill capacity in California. As mentioned earlier, electric batteries generally hold significant residual value, and 95 to 98 percent of all lead-acid batteries are recycled. In addition, the electric batteries that would power electric vehicles are packaged in battery packs and cannot be as easily disposed of as a single 12-volt conventional vehicle battery. It should be noted that the increased use of electric vehicles may actually result in a reduction of the amount of solid and hazardous waste generated, as NiMH and Lithium-ion in batteries have a much longer life span than conventional lead-acid batteries. Further, their size (over 100 pounds) makes them more difficult to handle and transport for unauthorized disposal.

Electric vehicles do not require the various oil and gasoline filters that are required by vehicles using internal combustion engines. Furthermore, electric vehicles do not require the same type or amount of engine fluids (oil, antifreeze, etc.) that are required by vehicles using internal combustion engines. Approximately 4,489 tons per year of waste oil was generated in the Alameda County in 2017 (see Table 3.6-3). Because of the widespread use and volume of waste oil, a portion of waste oil can be illegally disposed of via sewers, waterways, on land, and disposed of in landfills. Waste oil that is illegally disposed can contaminate the environment (via water, land or air). In addition, a substantial amount of motor oil leaks onto the highways from vehicles each year. This motor oil can be washed into storm drains and eventually ends up in the ocean.

Since electric motors do not require motor oil as a lubricant, replacing internal combustion engines with electric engines will reduce the potential impacts of motor oil use and disposal. Release of contaminants due to engine oil that burns up in, or leaks from, engines or due to burning of recovered engine oil for energy generation will also be correspondingly reduced. Additional use of electric vehicles is expected to have a beneficial environmental impact by reducing the amount of motor oil used, recycled, potentially illegally disposed, or washed into storm drains and ending up in the ocean.

Illegal or improper disposal of electric batteries could result in significant solid waste impacts by allowing hazardous wastes to be disposed in municipal landfill. However, the recycling of batteries is required under law. Further some manufacturers pay for used batteries from electric and hybrid vehicles. The value, size, and length of life of NiMH and Lithium-ion batteries are such that recycling is expected to be more predominant than with lead acid batteries. Therefore, the use of electric vehicles is not expected to result in an increase in the illegal or improper disposal of electric batteries. Further, batteries associated with electric vehicles are required to be recycled. Therefore, no significant increase in the disposal of hazardous or solid waste is expected due to increased use of electric vehicles.

3.6.6 MITIGATION MEASURES

The District's Strategies of feasibility studies, grants/incentives for future programs of energy upgrades and high efficiency filtration systems, investigation of the conversion of sources from conventional to zero emission sources, and encouraging the use of cleaner engines (Table 3.6-4), will have less than significant impacts. The amount of solid and hazardous waste generated is expected to be minimal and not expected to exceed the capacity of designated landfills. Based on the preceding analysis, due to the recycling value of the materials involved, the increased use of zero emission vehicles and subsequent generation of batteries and other types of waste from mobile sources and air pollution control technology and devices, the Plan was found to result in less than significant impacts. This is because the amount of solid and hazardous waste generated is expected to be minimal and not expected to exceed the capacity of designated landfills.

CEQA requires mitigation measures to be implemented to avoid or minimize any significant impacts. As no significant utilities and service systems impacts have been identified, no mitigation measures are required for solid/hazardous waste impacts.

3.6.7 CUMULATIVE UTILITIES AND SERVICES SYSTEMS IMPACTS

In addition to evaluating whether any action the District may take in implementing the proposed West Oakland Community Action Plan will cause significant utilities and service system impacts by itself, the EIR must also evaluate whether any District action may contribute to significant cumulative impacts caused by other existing and reasonably foreseeable future activities. Specifically, CEQA Guidelines Section 15064(h) requires an evaluation of whether the District's implementation of the proposed Plan will result in any "cumulatively considerable" contribution to an existing (or reasonably foreseeable future) significant utilities and service systems impact. The geographical location for the cumulative analysis is the jurisdictional boundaries of the Air District, 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.

3.6.7.1 Impacts of Past, Present and Reasonably Foreseeable Future Projects

As described in Section 3.6.2, the Bay Area has sufficient solid waste landfill capacity within the Bay Area and hazardous waste facilities are available within the state of California.

3.6.7.2 Contribution of the Proposed Project

The West Oakland Community Action Plan's strategies aforementioned will provide overall short and long term benefits, and are expected to result in minimal waste generation and are not expected to exceed the capacity of designated landfills. Therefore, utility and service system impacts associated with the Plan are not cumulatively significant and would not make a considerable contribution to a cumulatively significant utilities/service systems impact. The Air District concludes that the Plan will not result in any significant solid/hazardous waste impacts, individually or cumulatively, that must be addressed in this EIR.

CEQA requires mitigation measures to be implemented to avoid or minimize any significant impacts. As no significant utilities/service system impacts have been identified, no mitigation measures to reduce or avoid impacts are proposed for the West Oakland Community Action Plan.

CHAPTER 3.7

OTHER CEQA SECTIONS

This page intentionally left blank.

3.7 OTHER CEQA SECTIONS

3.7.1 GROWTH INDUCING IMPACTS

3.7.1.1 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(e)).

- 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;

- 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.

3.7.1.2 Economic and Population Growth, and Related Public Services

A project would directly induce growth if it would foster economic or population growth or the construction of new housing in the surrounding environment. The West Oakland Community Action Plan would maximize emission reductions and reduce residents' cumulative exposure to criteria air pollutants, diesel particulate matter, $PM_{2.5}$, and toxic air contaminants. The Plan does not include policies that would encourage the development of new businesses or housing, or population generating uses or infrastructure that would directly encourage such uses. The Plan does not change jurisdictional authority or responsibility concerning land use or property issues. Land use authority falls solely under the purview of the local governments, such as the City of Oakland. Therefore, the Plan would not directly trigger new development or alter land use policies.

The West Oakland Community Action Plan may require construction activities within the West Oakland community to implement some of the Strategies (e.g., control equipment at stationary sources, new electric vehicle charging stations, and hydrogen fueling stations). However, the Plan would not directly or indirectly stimulate substantial population growth or necessitate the construction of new community facilities that could lead to additional growth in West Oakland. It is expected that construction workers will be largely drawn from the existing workforce pool (about 7.6 million people) in northern California. Considering the existing workforce in the region, it is expected that a sufficient number of workers are available locally and that few workers would relocate for construction jobs potentially created by the Plan, as no major construction activities would be expected. Further, the Plan would not be expected to result in an increase in local population, housing, or associated public services (e.g., fire, police, schools, recreation, and library facilities) since no increase in population or the permanent number of workers is expected. Likewise, the proposed project would not create new demand for secondary services, including regional or specialty retail, restaurant, recreation, or entertainment uses. As such, the Plan would not foster economic or population growth in the region in a manner that would be growth-inducing.

3.7.1.3 Removal of Obstacles to Growth

A project would remove an obstacle to growth if it would expand existing infrastructure such as new roads or wastewater treatment plants. The Strategies that the Air District would implement as part of the Plan would not remove barriers to population growth, as it involves no changes to a General Plan, zoning ordinance or a related land use policy that would directly or indirectly cause the growth of new populations, communities, or currently undeveloped areas. Likewise, the Plan Schedule 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.

The Plan would provide incentives to electrify mobile and stationary emission sources, increasing electricity use. However, the increased electricity use is within what PG&E has forecast for its service area. While the electricity use associated with electric vehicles is expected to increase, PG&E predicts that its overall sales in electricity would remain the same or increase slightly (up to eight percent for the entire PG&E service area by 2030). The expected increases in energy efficiency and solar photovoltaic production are expected to offset a majority of the growth in electric vehicles, as well as economic and population driven growth.

3.7.1.4 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 undeveloped, open space areas. The West Oakland Community Action Plan would implement Strategies within an existing developed, urbanized community. New development outside of the boundaries of the community is not expected to occur. Therefore, the proposed Plan would not result in development within or encroachment into an open space area.

3.7.1.5 Precedent Setting Action

The West Oakland Community Action Plan aims to further emission reductions of criteria and TAC pollutant emissions in West Oakland. The Strategies that would be implemented as part of the proposed project (e.g., use of air pollution control equipment, replacement of older engines with new, cleaner models, and electrification of mobile sources) has been used and proven to be effective methods of emission reductions. Requiring technologies and measures that have been demonstrated to be effective to control air emissions would not result in precedent-setting actions that might cause significant environmental impacts.

3.7.1.6 Conclusion

The West Oakland Community Action Plan would not be considered growth-inducing, because it 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.

3.7.2 SIGNIFICANT ENVIRONMENTAL EFFECTS WHICH CANNOT BE AVOIDED AND SIGNIFICANT IRREVERSIBLE ENVIRONMENTAL CHANGES

Section 15126.2 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, implementation of the Strategies in the West Oakland Community Action Plan within the Air District's jurisdiction would not generate any significant unavoidable environmental impacts.

3.7.3 POTENTIAL ENVIRONMENTAL IMPACTS FOUND NOT TO BE SIGNIFICANT

The environmental effects of the West Oakland Community Action Plan that may have potentially significant adverse effects on the environment are identified, evaluated, and discussed in detail in the preceding portions of Chapter 3 of this EIR and in the Initial Study (see Appendix A) per the requirements of the CEQA Guidelines (§15126(a) and §15126.2). The potentially significant adverse environmental impacts as determined by the Initial Study (see Appendix A) are: air quality, energy, greenhouse gases, hazards and hazardous materials, and utilities and service systems (solid/hazardous waste only). The analysis provided in the Initial Study has concluded that the following environmental topics would be less than significant: aesthetics; agriculture and forestry resources; biological resources; cultural resources; geology and soils; hydrology and water quality;

land use and planning; mineral resources; noise, population and housing; public services, recreation, transportation, tribal cultural resources, utilities and service systems (other than solid/hazardous waste); and wildfire. The reasons for finding the environmental resources to be less than significant are explained in the following subsections, which are summarized from the Initial Study (see Appendix A) unless otherwise noted.

3.7.3.1 Aesthetics

West Oakland has a distinct visual character influenced by its historic residential neighborhoods, heavy industrial areas (including the Port of Oakland), and a mixing of the two. West Oakland is also characterized by a significant amount of vacant and underutilized land distributed throughout the area. Areas that have retained high visual quality tend to be those removed from industrial areas with consistent or unique architecture, or proximity to a landmark or focal point (City of Oakland, 2014).

A scenic vista is a location that offers a high quality and visually interesting view. There are no officially designated scenic vistas within the West Oakland area. Because there are no officially designated scenic vistas in the West Oakland Community itself, the Community Action Plan would not result in any impacts on a scenic vista.

Interstate 580 has been designated as a scenic highway from the San Joaquin County line to State Route 205, which is over 40 miles from West Oakland. The MacArthur Freeway is a designated scenic highway from San Leandro City limit to State Route 24 in Oakland, which is over 13 miles from West Oakland. Interstate 680 is designated as a scenic highway from Mission Boulevard in Fremont to the Contra Costa County line, which is about 20 miles from West Oakland away at its closest point. Thus, any physical changes in the West Oakland area that occur as a result of the proposed project would not be visible from any scenic highways due to distance separation and intervening topography (e.g., hills). There are no unique rock outcrops or plant life that could be considered a visual resource. Thus, modifications that occur as a result of the proposed project are not expected to damage or degrade existing scenic resources.

Physical modifications at facilities associated with implementation of Strategies in the Community Action Plan would be limited to existing facilities, and primarily industrial facilities. Other Strategies would encourage the use of zero and near-zero emissions mobile sources (vehicles, trucks, buses, locomotives), and provide shore power or use of a bonnet system for ships. Thus, they are not expected to be visible to the residential areas or have significant adverse aesthetic impacts to the surrounding community. Additionally, new air pollution control equipment is not expected to block any scenic vista, degrade the visual character or quality of the area, or result in significant adverse aesthetic impacts. Further, these facilities are existing facilities that currently operate and have existing lighting for nighttime operations. Therefore, implementation of the Community Action Plan Strategies is not expected to require any additional lighting to be installed as a result of the installation of new or modified equipment. New light sources, if any, would be located in industrial areas and 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, implementation of the Community Action Plan is not expected to have significant adverse aesthetic impacts to the surrounding community.

3.7.3.2 Agriculture and Forestry Resources

The West Oakland community is characterized as an urban area that has been developed. Approximately 59 percent of the land use is residential, 23 percent is utilized as industrial, commercial and auto-related/parking uses, while government/institutional and utilities uses occupy the remaining 18 percent of the land (City of Oakland, 2014). There are no farmland (agricultural) or forest resources located within the West Oakland community.

Implementation of the Community Plan would not involve 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, since agricultural and forest land resources are not located within the West Oakland community. Therefore, implementation of the Plan would have no impacts on agriculture and forestry resources.

3.7.3.3 Biological Resources

Wildlife within the West Oakland area is expected to be relatively low due to the urban nature of the area, absence of natural habitat, the proximity of streets and development, and level of human activity. Most of the land within the West Oakland area is developed and little open space is available. Virtually all the native habitat in the area has been removed and replaced with landscape species. Wildlife is limited to species that are compatible with human activities and includes birds (crows, starling, sparrows, pigeons) and small rodents (e.g., opossums, mice) that would typically be associated with developed urban areas.

Physical modifications associated with implementation of the Community Action Plan would be limited to changes within and urbanized area that lacks native habitat. According to the Open Space, Conservation and Recreation Element of the City of Oakland General Plan, there are no candidate species, sensitive species, or special status species known to occur within the West Oakland area (City of Oakland, 2014). The proposed project may require the construction of new equipment or development in the West Oakland area, but those physical changes would occur in already urbanized and developed areas.

There are a number of special-status animals that may potentially use habitat in the project area, including the peregrine falcon, Cooper's hawk, red-shouldered hawk, red-tailed hawk, pallid bat, silver-haired bat, hoary bat, and big free-tailed bat. Tree removal, building demolition and other construction activities can cause disturbance, noise or loss of habitat for resident or migratory birds and mammals, including special-status species that may forage in the project area. The City of Oakland enforces Standard Conditions of Approval on all development within the City including Tree Removal During Breeding Season. Implementation of the existing City requirements and compliance with federal and state requirements would minimize the potential impacts of any project activities on nesting birds and minimize the potential impacts to less than significant.

According to the Open Space, Conservation and Recreation Element of the City of Oakland General Plan, no riparian habitat, wetlands, or other sensitive natural communities have been identified within the West Oakland area because the area is largely paved and developed (City of Oakland, 2014). The proposed project may require the construction of new equipment or development in the West Oakland area, but those physical changes would occur in already urbanized and developed areas. Therefore, the proposed project would not be expected to impact riparian, wetlands, or other sensitive communities.

Any project that would involve the removal of any tree protected by the Tree Protection Ordinance would be required to first obtain a permit from the City and comply with any conditions of the permit, including replacement plantings and protection of remaining trees during construction activities. Compliance with City's Tree Project Ordinance would minimize potential conflicts with local policies or ordinance protecting biological resources to less than significant. Further, the AB 617 Community Plan is expected to encourage the planting of additional trees to provide buffers between industrial and residential areas and improved air quality in the West Oakland Area providing a beneficial impact on biological resources.

There is no Habitat Conservation Plan, Natural Community Conservation Plan or other adopted habitat conservation plan applicable to the West Oakland area. Therefore, the proposed project will not conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan.

3.7.3.4 Cultural Resources

There are approximately 1,421 Local Register properties within West Oakland. Of this total, 32 designated historic properties and properties rated of the highest importance (National Register properties, landmarks, heritage properties, study list properties S-7 Preservation Combining Zone properties, and Potential Designated Historic Properties) are within West Oakland. The great majority of the Local Register properties are located in the residential neighborhoods of West Oakland.

In addition, the City of Oakland recognizes three Areas of Primary Importance (API) that contain a total of approximately 831 contributing properties including 721 separate properties with the Oakland Point API, 84 contributing properties within the Oak Center API, and four contributing properties within the Southern Pacific Railroad Industrial API.

In areas where there are sensitive historic resources, the City of Oakland requires pre-construction surveys and the use of qualified archaeological monitors during grading operations to identify historic resources. These standard requirements, along with the fact that the Strategies in the West Oakland Community Action Plan are not expected to impact or require removal of historic structures, would limit impacts on historic cultural resources to less than significant.

The West Oakland area is located on the margins of the San Francisco Bay shoreline and near locations of former intermittent and perennial watercourses, which were historically used by Native Americans. Thus there is the potential for the presence of unrecorded cultural resources to be buried in West Oakland. In areas where there are sensitive resources, the City of Oakland requires pre-construction surveys and the use of qualified archaeological monitors during grading operations to identify historic resources. These standard requirements, along with the fact that the Strategies is the West Oakland Community Action Plan are not expected to require extensive construction or grading activities, are expected to limit impacts to historic cultural resources to less than significant.

3.7.3.5 Geology and Soils

Most of the Bay Area is located within the natural region of California known as the Coast Ranges geomorphic province, with the eastern portions of Contra Costa and Alameda Counties extending into the neighboring Great Valley geomorphic province, located east of the Coast Ranges. Much of the Coast Ranges province is composed of marine sedimentary and volcanic rocks located east of the San Andreas Fault. The region west of the San Andreas Fault is underlain by a mass of basement rock that is composed of mainly marine sandstone and various metamorphic rocks. 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.

West Oakland is located on the San Francisco Bay, which is a seismically active region, situated on a tectonic plate boundary marked by the San Andreas 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). The San Andreas and the Hayward faults are the two faults considered to have the highest probabilities of causing a significant seismic event in the Bay Area. The Hayward fault is the closest fault to West Oakland, located approximately 3.5 miles to the east along the southwestern base on the East Bay hill, paralleling Highway 13. Other principal faults capable of producing significant ground shaking in the Bay Area include the Rodgers Creek-Healdsburg, Concord-Green Valley, Marsh Creek-Greenville, San Gregorio-Hosgri, West Napa and Calaveras faults (ABAG, 2017). A major seismic event on any of these active faults could cause significant ground shaking and potential surface fault rupture.

New development potentially resulting in earthquake hazards is expected to be limited to the construction of air pollution control equipment or measures at industrial facilities. New construction (including modifications to existing structures) requires compliance with the California Building Code. Compliance with the California Building Code would minimize the impacts associated with existing geological hazards. Therefore, no significant impacts would be expected.

Construction associated with Strategies in the Plan is would be limited to urban areas, and primarily industrial facilities. All construction would take place at already existing facilities that have been previously graded. Thus, the proposed project is not expected to result in substantial soil erosion or the loss of topsoil as construction activities are expected to be limited to existing operating facilities that have been graded and developed, so that no major grading would be required.

3.7.3.6 Hydrology and Water Quality

The City of Oakland is responsible for the construction and maintenance of the local storm drainage system, while the Alameda County Flood Control and Water Control District constructs, operates, and maintains major trunk lines and flood control facilities in Oakland.

Stormwater runoff within West Oakland is conveyed by gravity through storm drain pipes to the Alameda County Flood Control and Water Control District Ettie Street Pump Station, located at the northern end of Ettie Street near I-580, where the stormwater is lifted and discharged to the Bay.

Implementation of Strategies such as replacing diesel engines, adding filtration systems to existing buildings, the use of zero emission sources, and generating additional electricity would not be expected to result in water use or wastewater discharge. The Strategies would not be expected to require the use of additional water, result in the discharge of wastewater, or result in impacts to water quality, since the Strategies do not involve the use of water.

Construction activities associated with land disturbance of more than one acre would requirement compliances with the Construction General Permit for Discharges of Storm Water Associated with Construction Activity Water Quality (Order No. 99-08-DWQ, NPDES No. CAS000002). Should any wastewater be generated, compliance with existing General Plan policies, Municipal Code regulations, and federal, state and local regulations would reduce impacts related to wastewater discharge to less than significant.

As discussed above, the control Strategies that the District would implement are not expected to require extensive construction or grading, that would result in alteration of the existing drainage pattern of the area, or increase the rate or amount of surface water runoff. The West Oakland area is urbanized and developed so the project is not expected to add impervious surfaces that would alter surface water runoff. Further, there are no natural streams or rivers in the West Oakland area, so the project would not alter the course of a stream or river. Therefore, the impact of the Community Action Plan on surface water discharge is expected to be less than significant.

No portion of West Oakland is located within a 100-year or 500-year flood hazard area, as mapped on the National Flood Insurance Program Flood Insurance Rate Maps prepared by the Federal Emergency Management Agency. For these reasons, no significant impacts associated with flooding would be expected.

Tsunamis are seismically induced sea waves that, upon entering shallow near-shore waters, may reach heights capable of causing widespread damage to coastal areas. The western portion of West Oakland, generally west of Mandela Parkway, is subject to tsunami inundation (City of Oakland, 2014). The Alaska Tsunami Warning Center, State Warning System and Oakland emergency alert system, including the outdoor warning sirens in West Oakland, would provide early notification of an advancing tsunami allowing evacuation of people. Given the rare occurrence of tsunamis, the distance of West Oakland to the Bay shoreline, and the emergency alert system enabling evacuation of people, implementation of the Community Action Plan would not place additional structures in areas that are expected to be impacted by tsunami inundation.

The groundwater basin is not currently being used for municipal water supply (City of Oakland, 2014). Further, implementation of the Community Action Plan is not expected to require additional water supplies. Therefore, the proposed project would not conflict with or obstruct implementation of a water quality control plan or sustainable groundwater management plan.

3.7.3.7 Land Use and Planning

The land uses in the West Oakland area vary greatly and are described below.

- Land uses to the north include the Emeryville portion of the East Bay Bridge Shopping Center, which contains regional commercial, community commercial, and medium-density residential uses. Other residential, light industrial, office and public uses are located further to the north in Emeryville.

- Interstate 580 is located along the northern boundary of West Oakland. North of Interstate 580 is the Longfellow residential neighborhood, near MacArthur Boulevard and 40th Street in North Oakland.

- To the northeast is the MacArthur BART Station, within the median of State Route 24. This area includes the MacArthur Transit Village, which provides 624 high-density, multifamily housing units, retail space, and a BART parking garage.

- Interstate 980 is located along the eastern boundary of West Oakland. East of Interstate 980 are the Pill Hill and Uptown neighborhoods, Downtown Oakland, City Center, Old Oakland, and the 19th Street and 12th Street BART stations.

- To the southeast is the waterfront Jack London district with Jack London Square, Amtrak's Oakland Jack London Square Station, and the Oakland Ferry Terminal.

- The Port of Oakland lies southwest of West Oakland. Interstate 880, the Union Pacific Railroad, and the Burlington Northern and Santa Fe (BNSF) Railroad are located along the southern and western boundary of West Oakland. The Union Pacific Intermodal Yard lies south of Interstate 880, within the Port. Port shipping terminals line the Oakland Estuary/Inner Harbor Channel further south and the Outer Harbor Channel to the west. The BNSF Intermodal Yard and Middle Harbor Park are to the southwest.

- Interstate 880 is located along the western boundary of West Oakland area. The Union Pacific Railroad and the BNSF Railroad, and the Knight Rail Yard are located underneath and immediately west of Interstate 880. The former Oakland Army Base (OARB), and former OARB Redevelopment Area, lies west of Interstate 880. The Oakland Base Reuse Authority currently leases space for various transportation, industrial and commercial uses until the former Army Base is redeveloped for permanent non-military uses.

- Land uses to the northwest of West Oakland include the East Bay Municipal Utilities District Main Wastewater Treatment Plant; the Interstates 80, 580, and 880 Interchange; and the Emeryville Crescent State Marine Reserve on the shore of San Francisco Bay. The eastern terminus of the San Francisco-Oakland Bay Bridge, and the bridge toll plaza and maintenance area lie further to the northwest (City of Oakland, 2014).

West Oakland is currently subject to existing conditions that disrupt and divide the community. These conditions include the location of heavy industrial and transportation uses immediately adjacent to residential uses, and the separation of West Oakland from downtown Oakland, the waterfront at Jack London Square, Middle Harbor Park, and the rest of the City by freeways that surround the community. Implementation of the Strategies in the West Oakland Plan would not be to physically divide the community, beyond the divisions that currently exist, as any new facilities would be expected to occur within the confines of the existing facilities. Further, implementation of the Strategies under the jurisdiction of the Air District would not be expected to require any changes to land use or result in development that could conflict with a land use plan, policy, or regulation. Land use authority falls solely under the purview of the local governments and the Air District is specifically excluded from infringing on existing city or county land use authority (California Health and Safety Code §40414). Therefore, the proposed project would not disrupt or divide the physical arrangement of the West Oakland community or any surrounding community or lead to any significant change in land use.

3.7.3.8 Mineral Resources

According to the California Department of Conservation Division of Mines and Geology's Aggregate Resources Map, West Oakland is not currently considered an Aggregate Resource sector. The Leona quarry was the last mine in Oakland to be identified as a regionally significant source of aggregated resources. Areas with this designation are judged to be of prime importance in meeting future mineral needs in the region, and land use decisions must consider the importance of these resources to the region as a whole. The Leona Quarry has been closed for many years and there is no other land in Oakland with such a designation (City of Oakland, 2014).

No known mineral resources are located within West Oakland and the area is not designated as a locally important mineral resource recovery site under the City of Oakland General Plan Land Use and Transportation Element or Open Space, Conservation and Recreation Element. Therefore, no impacts on mineral resources are expected due to implementation of the West Oakland Community Action Plan.

3.7.3.9 Population and Housing

The population of West Oakland grew from approximately 23,400 to 25,250 people between 1990 and 2011, an increase of 15 percent, which is faster than the overall growth rate for the City of Oakland of 11 percent. The number of households in West Oakland decreased from 8,683 to 8,431 between 1990 and 2011, in part due to the demolition and reconstruction of the Chestnut/Linden and Westwood Gardens public housing projects. The average household size in West Oakland increased between 1990 and 2011 from 2.67 to 2.90 persons per household and the percentage of households with children rose from 40 to 60 percent. In 2011, West Oakland had an estimated 10,444 housing units, of which 8,431 were occupied, leaving a 19.3 percent vacancy rate, while the vacancy rate in Oakland was 6.3 percent, substantially less than West Oakland (City of Oakland, 2014).

According to the Association of Bay Area Governments (ABAG), population in the Bay Area is currently about 7.6 million people and is expected to grow to about 9.6 million people by 2040 (ABAG, 2017). The proposed project is not anticipated to generate any significant effects, either directly or indirectly, on the Bay Area's population or population distribution. In addition, it is not expected that the affected facilities would need to hire additional personnel to operate new air pollution control equipment at existing facilities or add filtration systems to existing buildings. It is expected that the existing labor pool would accommodate the labor requirements for the temporary construction workers, as the existing labor pool is over seven million people. As such, adopting the Community Action Plan is not expected to induce substantial population growth.

Construction associated with the proposed project is expected to be limited to constructing new air pollution control equipment or facility modifications at existing facilities. The implementation of the Community Action Plan is not expected to result in the creation of any industry/business 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 proposed project.

3.7.3.10 Public Services

The Oakland Fire Department operates 25 fire stations. There are two fire stations within the West Oakland. The Oakland Fire Department provides fire protection (prevention and suppression), and local emergency response (rescue, hazardous materials response, and first responder emergency medical services) services to West Oakland. In addition to firefighting and emergency medical response capabilities, the Oakland Fire Department also has a Hazardous Materials Unit that operates from Station 3 in West Oakland and responds citywide to emergencies involving hazardous materials. The Oakland Fire Department's response time goal is seven minutes, 90 percent of the time.

The Oakland Police Department provides police services throughout the city. The Oakland Police Department has approximately 660 sworn police officers, approximately 297 support staff, and 10 reserve officers. The Oakland Police Department has geographically divided the City into three command areas, 57 community policing beats and 35 patrol beats (City of Oakland, 2014).

The Oakland Unified School District operates the public school system in the City of Oakland. The Oakland Unified School District administers 77 elementary schools, 19 middle schools, one junior high school, 31 high schools, and two K-12 schools. It is also responsible for three alternative schools, two special education schools, three continuation schools, three community day schools, and one opportunity school. The District's overall enrollment peaked in 1999 at 55,000, dropped to 39,000 by 2007, and is continuing to decline. Declining enrollment is projected to continue (City of Oakland 2014). Oakland Unified School District has four elementary schools, two middle schools and one high school in West Oakland. Oakland Unified School District charter schools in West Oakland include: Oakland Charter High School, KIPP Bridge Charter School, Oakland School of the Arts, and the American Indian Public Charter School II.

The City of Oakland General Plan establishes a parkland standard of four acres per 1,000 residents (for parks that meet the active recreational needs of the community as opposed to passive recreational open space). Oakland provides 1.33 acres of local serving park acreage per 1,000 residents, which falls short of the General Plan parkland standard.

According to the City of Oakland General Plan Open Space, Conservation and Recreation (OSCAR) Element, West Oakland has 56.70 acres of parkland, including schoolyards and athletic fields, which equates to 2.43 acres of parkland per 1,000 residents, or 60 percent of the General Plan parkland standard. Despite this deficiency, West Oakland has more parkland than any other flatland neighborhoods in Oakland.

Implementation of the Community Action Plan 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. The facilities affected by the proposed project are existing facilities for which public services are already required and no increase in the need for such services is expected. Further, a number of industrial facilities have existing security and fire-fighting capabilities, e.g., port facilities, and are able to respond to fire and security issues independent of public police and fire services. There will be no increase in population as a result of the implementation of the Community Action Plan and, therefore, no need for physically altered government facilities.

As discussion above, the proposed project is not expected to induce population growth because the existing local labor pool (e.g., workforce) is sufficient to accommodate the expected temporary construction work force. No increase in permanent workers is expected to be required to operate the equipment that may be installed at affected facilities. Therefore, there will be no increase in local population and thus no impacts are expected to local schools or parks.

3.7.3.11 Recreation

Recreational parks in West Oakland include Brush Street, Bertha Port, Crescent, Cypress Freeway Memorial, DeFremery, Durant, Fitzgerald, Grove Shafter, Lowell, Marston Campbell, McClymonds, Poplar, Raimondi, South Prescott, Saint Andrews Plaza, Union Plaza, Wade Johnson, Willow Street, Wood Street Pocket Park, and 25th Street. Other nearby parks outside the area also serve West Oakland residents, including Middle Harbor Park and Portview Park in the Port of Oakland. Recreation centers in West Oakland include DeFremery Recreation Center, West Oakland Senior Center, and Willie Keyes Community Center.

As discussed under "Land Use" above, there are no provisions in Community Action Plan 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 the Strategies that the District would implement. Implementation of these types of control measures would occur within existing developed facilities and would not impact recreational facilities. Further, no increase in permanent workers is expected at the affected facilities; thus, there would be no increase in population that would result in more frequent use of recreational facilities.

3.7.3.12 Transportation

(Note: The initial conclusions of the Initial Study indicated that transportation impacts may potentially occur due to the implementation of the Community Action Plan Strategies and that they would be further evaluated in the Draft EIR. After further development of the Strategies and review of their potential impacts, it was determined that the none of the Strategies that were under the jurisdiction of the Air District would increase traffic or involve any significant changes to traffic circulation, traffic hazards, increases in vehicle miles traveled, or impacts on emergency access. Therefore, further review of the potential transportation impacts in the Draft EIR was not warranted.)

Regional vehicular access to and within West Oakland is provided by a freeway system that includes Interstate 80, Interstate 580, Interstate 880, Interstate 980, and State Route 24. Other key roadways in West Oakland include Frontage Road, Mandela Parkway, Adeline Avenue, and Market Street.

A Level of Service analysis completed at major intersections in West Oakland indicated under weekday morning and evening peak hours, all intersections currently operate at acceptable levels of service during peak hours (level of service D or better) (City of Oakland, 2014).

Transit service is provided by the Alameda-Contra Costa Transit District (AC Transit) and BART. AC Transit provides an extensive network of fixed route bus services in Alameda and Contra Costa counties. It also offers Transbay service to destinations in San Francisco, San Mateo and north Santa Clara counties. AC Transit service is comprised of 10 transit routes throughout West Oakland.

Implementation of Strategies such as replacing diesel engines, adding filtration systems to existing buildings, the use of zero emission sources, producing alternative fuels and generating additional electricity would not be expected to result in a substantial increase in traffic. Further, construction workers would be temporary and the traffic would cease once construction activities are complete.

Following construction activities, the Strategies would not be expected to generate a substantial increase in traffic, either workers or trucks. As discussed in "Population and Housing", it is not expected that the affected facilities would need to hire additional personnel to operate new air pollution control equipment at existing facilities or add filtration systems to existing buildings, so no increase in permanent worker traffic would be expected. Further, the project would not conflict or be inconsistent with CEQA Guidelines § 15064.3 subdivision(b).

3.7.3.13 Tribal Cultural Resources

As discussed under Cultural Resources above, the West Oakland area is located on the San Francisco Bay shoreline and near locations of former intermittent and perennial watercourses that were historically used by Native Americans. Thus, there is the potential for the presence of unrecorded tribal cultural resources to be buried in West Oakland. Of the Strategies that the Air District would implement, a number of them would apply to existing sources and could include replacing diesel engines, controlling emissions from existing facilities, and adding filtration systems to existing buildings. Other Strategies would encourage the use of zero emissions mobile sources (trucks, buses, locomotives). Implementation of these types of control measures would not be expected to require extensive construction or grading that could impact tribal cultural resources. In areas where there are sensitive resources, the City of Oakland requires pre-construction surveys and the use of qualified archaeological and tribal monitors during grading operations to identify historic resources. These standard requirements, along with the fact that the Strategies in the West Oakland Community Action Plan are not expected to require extensive construction or grading activities, are expected to limit impacts on historic cultural resources to less than significant.

3.7.3.14 Utilities and Service Systems

The potential increase in energy consumption associated with the Community Action Plan was evaluated in the EIR (see Draft EIR, Subsection 3.3 – Energy). The potential increase in solid/hazardous waste associated with the Community Action Plan was also evaluated in the EIR (see Draft EIR, Subsection 3.6 – Utilities and Services Systems).

The potential water use, wastewater impacts, and storm water drainage impacts associated with the West Oakland Community Action Plan were discussed under Hydrology and Water Quality. As discussed in Section 3.7.3.6 – Hydrology and Water Quality above, the Strategies that the District would implement as part of the Community Action Plan would not be expected to require the use of additional water, result in the discharge of wastewater, result in impacts to water quality, or result in changes to the stormwater drainage system.

One of the Strategies that the Air District would encourage is the installation of vegetative borders to act as biofilters between Interstate 880 and the Prescott neighborhood in West Oakland. Installation of vegetation would likely require the use of additional water to allow for the growth of healthy landscape vegetation, especially when vegetation is first planted. The use of native vegetation would assure that vegetation that is planted would use minimal water, e.g., 50-150 gallons per week, which is well below the CEQA significance threshold for water use. Therefore, the project is not expected to result in significant impacts to water supplies.

3.7.3.15 Wildfires

The California Department of Forestry and Fire Protection (CalFIRE) maps areas of significant fire hazard based on fuels, terrain, weather, and other relevant factors. These zones, referred to as Fire Hazard Severity Zones, determine the requirements for special building codes designed to reduce the potential impacts of wildland fires on urban structures. West Oakland is located within an existing urbanized area that is surrounded by development. No wildlands are located in the immediate or surrounding area and the area is not within or near lands classified as very high fire hazard severity zones. West Oakland is outside Oakland's Wildfire Prevention Assessment District boundary, which indicates that it is likely not subject to significant wildfire hazard. For these reasons, implementation of the Community Action Plan would not expose people or structures to wildfires, would not impair an adopted emergency response plan or emergency evacuation plan for wildfires, would not expose people to pollutants from a wildfire or the uncontrolled spread of a wildfire and would not expose people or structures to flooding or landslides as a result of post-fire slope or drainage changes. Therefore, no potential significant adverse impacts resulting from wildfires are expected from the proposed project.

CHAPTER 4

ALTERNATIVES ANALYSIS

This page intentionally left blank.

4.0 ALTERNATIVES ANALYSIS

4.1 INTRODUCTION

This Draft Environmental Impact Report (DEIR) provides a discussion of alternatives to the proposed project as required by CEQA. According to the CEQA Guidelines, alternatives should include realistic measures to attain the basic objectives of the proposed project and provide means for evaluating the comparative merits of each alternative (CEQA Guidelines 15126.6(a)). 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)). For example, "[a]n EIR need not consider an alternative whose effect cannot be reasonably ascertained and whose implementation is remote and speculative." (CEQA Guidelines 15126.6(f)(3)).

The alternatives included in CEQA documents are typically developed by breaking down the project into distinct components and varying the specifics of one or more of the components. Different compliance approaches that generally achieve the objectives of the project may also be considered as project alternatives.

The discussion of alternatives is required to focus on alternatives to the proposed project or its location that are capable of avoiding or substantially lessening any significant effects of the proposed project on the environment (CEQA Guidelines 15126.6(b)). As discussed in Chapter 3 of this EIR and the Initial Study (see Appendix A), the Strategies that the Air District would implement under the West Oakland Community Action Plan are not expected to result in significant impacts to any environmental resources including aesthetics, agricultural resources, air quality, biological resources, cultural resources, energy, greenhouse gases, geology and soils, hazards and hazardous materials, hydrology and water quality, land use and planning, mineral resources, noise, population and housing, public services, recreation, transportation, tribal cultural resources, utilities service systems, and wildfires. Because no significant impacts have been identified for the proposed project, alternatives are not required to be analyzed in this EIR.

However, in order to provide a full environmental review and fulfill the intent of CEQA, an alternatives analysis has been prepared. 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)). The intent of this alternatives analysis is to foster informed decision making and public participation by analyzing reasonable alternatives to the Strategies in the West Oakland Community Action Plan and disclosing whether there may be an alternative which would achieve the Plan's objectives while also avoiding or substantially lessening any significant impacts.

4.2 PROJECT OBJECTIVES

CEQA Guidelines Section 15124(b) requires an EIR to include a statement of objectives, which describes the underlying purpose of the proposed project and may discuss the project benefits. The purpose of the statement of objectives is to aid the lead agency in identifying alternatives and the decision-makers in preparing a statement of findings and a statement of overriding considerations, if necessary. The objectives of the West Oakland Community Action Plan are summarized as follows:

- For the Air District and West Oakland community to work together to address the disparities in air pollution and related health effects in the West Oakland community.
- To reduce criteria pollutant and toxic air contaminant emissions from stationary sources of air pollution within and adjacent to West Oakland.
- To reduce criteria pollutant and toxic air contaminant emissions from mobile sources, such as heavy-duty trucks and light-duty vehicles that travel in West Oakland and on surrounding freeways and streets;
- To reduce criteria pollutant and toxic air contaminant emissions from mobile sources that serve the Port of Oakland, such as cargo equipment, port trucks, locomotives, ocean-going ships, and harbor craft in the San Francisco Bay; and
- To improve the health of residents, workers, and visitors to West Oakland through a reduction in emissions and exposure to air pollutants.

4.3 ALTERNATIVES REJECTED AS INFEASIBLE

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 "[a]mong the factors that may be used to eliminate alternatives from detailed consideration in an EIR are: (i) failure to meet most of the basic project objectives; (ii) infeasibility; or (iii) inability to avoid significant environmental impacts."

AB 617 requires air districts to work with the community to develop emission reductions measures to reduce air emissions and exposure to air emissions. Achieving the goals of AB 617 is likely going to require implementation of the identified Strategies in the Plan and collaboration with the Air District, the West Oakland Community, as well as the City of Oakland, Port of Oakland, California Air Resources Board (CARB), East Bay Municipal Utility District (EBMUD), California Department of Transportation (Caltrans), Pacific Gas & Electric Co. (PG&E), Alameda County Transportation Commission (ACTC), Bay Area Rapid Transit (BART), Oakland Unified School District (OUSD), Alameda County Public Health Department (ACPHD), and East Bay Clean Energy. The Strategies in the Plan were developed in consultation with these agencies and the West Oakland Indicators Project and were chosen as the Strategies most likely to be effective in reducing air emissions and exposure to air emissions. Alternatives that consider other

Strategies than those in the Plan may also be feasible, but other feasible Strategies have not yet been developed at this time. If the West Oakland Community Action Plan fails to meet the goals and targets in the Plan, additional Strategies would likely be required to reduce the disproportionate impacts from pollution.

Developing a Plan that would focus strategies on only TAC emissions or only criteria pollutant emissions was considered. However, TAC emissions and particulate emissions are closely related, e.g., diesel particulate matter. Only controlling criteria pollutant emissions would not be expected to provide sufficient emission reductions of TAC emissions to reduce the high cumulative exposure burden of air pollution on the residents of West Oakland. Controlling TAC emissions would likely result in larger reductions in air pollution and the related reduction in health risk impacts, although emission reductions in criteria pollutants would also be expected (e.g., particulate matter). Since both criteria and toxic air contaminants result in a high cumulative exposure burden to West Oakland, controlling both would provide the most benefit to the community.

Delaying the implementation of the Community Action Plan was evaluated, but determined not to be feasible. Delaying implementation could have the result of worsening potential environmental and health impacts. Not having a community action plan in West Oakland would neither meet the project's objectives, nor comply with AB 617's deadlines. Delaying implementation would also delay any benefits associated with the Plan and was determined not to be feasible.

4.4 DESCRIPTION OF THE PROJECT ALTERNATIVES

The possible alternatives to the West Oakland Community Action Plan are limited by the nature of the project. Other than the No Project Alternative, the other alternative is limited to implementing only those Strategies within the jurisdiction of the Air District.

4.4.1 ALTERNATIVE 1 – NO PROJECT ALTERNATIVE

CEQA Guidelines §15126.6(e) requires evaluation of a "'No project' alternative." Under the No Project Alternative, it is assumed that the West Oakland Community Action Plan would not be implemented. There would be no Strategies to control stationary or mobile emission sources. The land use Strategies to limit exposure to emissions would also not be implemented, nor would the health programs to limit exposure to emissions, and improve the health of residents and sensitive receptors in West Oakland.

Alternative 1 would not comply with AB 617, which directs communities and air districts to work together to address air pollution and related health effects in overburdened communities, like West Oakland. CARB has selected West Oakland as an area with a high cumulative exposure burden to both toxic and criteria air pollutants. Under the requirements of AB 617, the Air District is directed to develop and approve a community emissions reduction program for West Oakland by October 1, 2019, which is consistent with the state-wide strategy and includes emission reduction targets, specific reduction measures, a schedule for implementation of the measures, and an enforcement plan. The West Oakland Community Action Plan complies with the AB 617 requirements for overburdened communities.

Therefore, Alternative 1 would not comply with the AB 617 requirements. Per CEQA Guidelines §15364, "'Feasible' means capable of being accomplished in a successful manner within a reasonable period of time, taking into account economic, environmental, legal, social, and technological factors." Alternative 1 would not comply with the AB 617 requirements and would not be considered feasible at this time.

It should be noted that it would be unlikely that the Air District and other agencies would remain out of compliance with AB 617 indefinitely and some action would likely be taken in the future to comply, as CARB and the other agencies could implement Strategies that are in their jurisdiction. Nonetheless, for the purpose of comparison and public disclosure, it will be assumed that no action will be taken under the No Project Alternative.

4.4.2 ALTERNATIVE 2 – DISTRICT ONLY STRATEGIES

AB 617 requires each air district for which CARB has determined that there is an area with a high cumulative exposure burden to both toxic and criteria air pollutants, to prepare an emission reduction program, in consultation with the local communities. Under Alternative 2, only the Strategies for which the Air District has jurisdiction for would be implemented (see Table 4-1).

Alternative 2 would not comply with AB 617, which directs communities and air districts to improve air quality and health beyond existing State and regional programs, and to work together to address air pollution and related health effects in overburdened communities, like West Oakland. CARB has selected West Oakland as an area with a high cumulative exposure burden to both toxic and criteria air pollutants. Under the requirements of AB 617, the Air District is required to work with community representatives to develop and approve a community emissions reduction program for West Oakland by October 1, 2019. In compliance with the Final Community Air Protection Blueprint (2018), "The communities selected in the first year of the Program will see additional new actions through potential regulations, focused incentive investments, enforceable agreements, and engagement with local land use authorities to reduce emissions and exposure to air pollution" (p.4). Alternative 2 would only partially meet the requirements of AB 617, as the Strategies to be implemented by other agencies would not occur as part of a comprehensive implementation Plan.

TABLE 4-1

West Oakland Community Action Plan – Alternative 2, Air District Only Strategies

#	Strategies	Authority
	Land Use	
2	The Air District will continue to engage in environmental review processes for development projects in West Oakland, such as the Oakland A's Ballpark and the MacArthur Maze Vertical Clearance Project, including coordinating with community partners and lead agency staff, providing data and technical assistance, and reviewing and commenting on CEQA documents through 2025.	Air District
3	The Air District will study the potential air pollution and health outcomes of allowing truck traffic on I-580 and designating a truck lane on I-880. Allowing truck traffic on I-580 would require legislative approval, re-engineering, and re-construction.	Air District
6	The City of Oakland uses incentives and subsidies to relocate businesses away from West Oakland that do not conform with the zoning designations adopted in the West Oakland Specific Plan. The Air District will provide emissions data and technical support to assist the City in these efforts and to ensure that any relocated businesses do not cause exposure issues at the new location.	City of Oakland, Air District
12	The Air District and the West Oakland Environmental Indicators Project intends to implement the green infrastructure project currently under development between Interstate I-880 and the Prescott neighborhood in West Oakland by 2021.	Air District
14	The Air District provides subsidized loans for local small businesses to install energy storage systems (e.g. batteries, fuel cells) to replace stationary sources of pollution (e.g. back-up generators).	Air District
16	The City of Oakland, in partnership with the Steering Committee, CARB and the Air District, studies the exposure reduction benefit of requiring solid or vegetative barriers to be incorporated into site design between buildings and sources of air pollution (for example, a freeway).	City of Oakland CARB, Caltrans, Air District
21	The Air District works with the City and Port of Oakland and other agency and local partners to create a Sustainable Freight Advisory Committee to provide recommendations to each agency's governing board or council. The Committee's scope includes: air quality issues, enhanced/increased enforcement of truck parking and idling, improved referral and follow-up to nuisance and odor complaints related to goods movement, improvements to the Port appointment system, charging infrastructure and rates, developing land-use restrictions in industrial areas, and consideration of video surveillance to enforce truck parking, route, and idling restrictions.	Air District, Port of Oakland, City of Oakland
24	The Air District works with agency and local partners to improve referral and follow-up on nuisance and odor complaints by 2021. This work includes updates to complaint processes, enforcement procedures, and coordination with other public agencies regarding odors, backyard burning, and other complaints.	Air District
	Mobile Sources	
36	The Air District works with CARB to streamline the process for providing financial incentives for fueling infrastructure, and for low and zero-emission equipment. The Air District increases outreach and assistance to individual owner-operators and small companies by providing two workshops and enhanced outreach in West Oakland by 2022.	Air District
43	The Air District plans to offer up to $7 million per year to replace older autos through the Vehicle Buy Back program, and up to $4 million per year through the Clean Cars for All program to replace older autos and provide an incentive for a hybrid electric, plug-in hybrid electric, battery	Air District

#	**Strategies**	**Authority**
	electric vehicle, or Clipper Card for public transit.	
44	The Air District offers financial incentives to replace box and yard diesel trucks with zero emission trucks owned by West Oakland businesses every year.	Air District
45	The Air District plans to offer financial incentives to upgrade tugs and barges operating at the Port of Oakland with cleaner engines every year.	Air District, Port of Oakland
46	The Air District plans to offer financial incentives to upgrade line-haul, passenger, and switcher (yard) locomotives with cleaner engines every year.	Air District
47	The Air District plans to offer financial incentives to support the development of a hydrogen refueling station and the purchase of trucks and off-road equipment powered by fuel cells every year.	Air District
48	The Air District offers financial incentives to replace long-haul diesel trucks with zero-emission trucks owned by West Oakland businesses every year.	Air District
49	The Air District will award up to $1 million in funding incentives to pay for the cost of purchasing cleaner equipment in West Oakland, potentially including: electric lawn and garden equipment, battery electric Transportation Refrigeration Units, and cargo-handling equipment, by 2021.	Air District
52	Through the Pilot Trip Reduction Program, the Air District offers incentives for the purchase of electric bicycles for bike share programs.	Air District
61	The Air District works with Schnizter Steel to study the feasibility of installing a shore-power or bonnet system to capture and abate vessel emissions at the West Oakland facility by 2021.	Air District
62	The Air District intends to seek authority in 2021 to reduce emissions and risk from magnet sources, such as the Port of Oakland, freight operations and warehouse distribution centers.	Air District
	Stationary Sources	
63	The Air District proposes amendments to existing regulations to further reduce emissions from metal recycling and foundry operations, such as changes to: 1) Rule 6-4: Metal Recycling and Shredding Operations, which requires metal recycling and shredding facilities to minimize fugitive PM emissions through the development and implementation of facility Emission Minimization Plans; and 2) Rule 12-13: Foundry and Forging Operations, which requires metal foundries and forges to minimize fugitive emissions of PM and odorous substances through the development and implementation of facility Emission Minimization Plans by 2025.	Air District
64	The Air District's Rule 11-18: Reduce Risk from TACS at Existing Facilities requires selected Bay Area facilities to reduce risk or install best available retrofit control technology for toxics on all significant sources of toxic emissions. Based on the results of the Technical Assessment, the Air District may require Schnitzer Steel and the East Bay Municipal Utility District to adopt a Risk Reduction Plan if the health risk determined by the facility-wide health risk assessment exceeds a risk action level per the requirements of Rule 11-18 implementation.	Air District
65	The Air District intends to provide incentives to replace existing diesel stationary and standby engines (fire pumps, dryers, conveyor belts, cranes) with Tier 4 diesel or cleaner engines. Priority is given to upgrading Tier 0, 1 & 2 engines located closest to schools, senior citizen centers, childcare facilities, and hospitals.	Air District
66	The Air District proposes new regulations to reduce emission sources from autobody and other coating operations, including the use of vanishing oils and rust inhibitors by 2025.	Air District
67	The Air District proposes new regulations to reduce emissions from wastewater treatment plants and anaerobic digestion facilities, such as a regulation to reduce emissions of methane, reactive organic gases, and oxides of nitrogen by 2019.	Air District
68	The Air District proposes a regulation to reduce emissions of reactive organic gases and other toxic compounds from organic liquid storage tanks by 2020.	Air District

#	Strategies	Authority
	Health Programs	
70	The Air District intends to develop and fund a program to reduce exposure to air pollution at schools, day care facilities, senior centers, health facilities, public facilities, apartments and homes in West Oakland by 2021. This strategy includes policies or grants for building energy efficiency upgrades to reduce infiltration of pollutants and the installation of high-efficiency air filtration systems (rated MERV 14 or higher).	Air District
75	The Air District researches actions that are potentially exposure-reducing, such as: 1) an engineering evaluation of exhaust stacks and/or vents to determine if relocation will reduce local exposure; (2) a study to determine if smart air filtration systems can reduce exposure by in-taking air during daily non-peak vehicle travel times, such as between midnight and four a.m.; and (3) a study of the potential air quality benefits of a centralized package delivery site such as personal lockers by 2025.	Air District
82	CARB conducts a technology assessment of commercial cooking rules and control strategies and proposes incentives and/or a Suggested Control Measure for commercial cooking. The Air District offers incentives and/or proposes a regulation to reduce emissions from commercial cooking.	Air District, CARB
84	The Alameda County Transportation Commission will continually engage with the community, at a minimum through participation in quarterly meetings of the WOCAP implementation committee, starting with the early planning and budgeting stages of transportation projects that are being developed by ACTC in West Oakland in order to ensure projects do not increase transportation impacts on residents. These projects will undergo appropriate reviews to assess the environmental and health impacts, and potential local benefits, and adopt associated mitigation measures so they do not result in a net increase in air pollution or health inequities for residents most impacted by the county's freight transportation system in West Oakland.	ACTC, Caltrans, Air District

4.5 ENVIRONMENTAL IMPACTS OF PROJECT ALTERNATIVES

4.5.1 ALTERNATIVE 1 – NO PROJECT ALTERNATIVE

4.5.1.1 Air Quality

Under Alternative 1, the West Oakland Community Action Plan would not be implemented. Therefore, no construction emissions from the implementation of strategies are expected under the No Project Alternative. Potential construction emissions associated with the construction of enclosures would be avoided, although these impacts would not exceed significance thresholds and would not be considered significant. Nonetheless, they would be eliminated under Alternative 1.

The emission benefits that are expected from the proposed project are presented in Table 3.2-17. For some of the Strategies that would be implemented by the Air District (as well as some of the Strategies implemented by other agencies), emission reductions are unknown at this time but would nonetheless be expected to occur. Under Alternative 1, the emission reductions (i.e., beneficial impacts) associated with ROG, CO, NOx, SOx, PM_{10} and $PM_{2.5}$ would also not occur.

The potential increase in TAC emissions associated with the proposed project were also determined to be less than significant. Further, the proposed project is expected to result in a beneficial reduction in TAC emissions, as well, as criteria pollutants. However, it is not possible to estimate the potential TAC emissions reductions at this point until appropriate implementation actions and engineering analyses have been completed and so forth. Nonetheless, electrification of stationary and mobile sources that use diesel, for example, would be expected to result in a decrease in diesel particulate emissions in the West Oakland area. The potential TAC emissions reductions under the proposed project would be eliminated under Alternative 1. Therefore, Alternative 1 would fail to reduce the high cumulative exposure burden to air pollution to the residents of West Oakland.

4.5.1.2 Energy

The West Oakland Community Action Plan would increase the penetration of zero and near-zero vehicles, potentially provide electrification for marine vessels at berth, and increase the future demand for electricity in the Bay Area and other areas of California that provide electricity to West Oakland. The Plan would be expected to result in an increase of approximately one GWh of electricity (see Table 3.3-3). The potential electricity impacts were determined to be less than significant as they are within the energy forecast and expected electricity production for PG&E.

Under Alternative 1, the potential increase in electricity associated with the West Oakland Community Action Plan would be eliminated, as well as the estimated reduction in the use of gasoline and diesel fuel. It is expected that PG&E would still move forward with electricity sufficient to power up to two million cars due to other state directives.

4.5.1.3 Greenhouse Gases

The West Oakland Community Action Plan would increase the penetration of zero and near-zero vehicles, increasing the generation of electricity. The potential increase in electric vehicles as part of Strategies in the Plan is within the range of vehicles that PG&E has forecast for its service area of two million vehicles. PG&E expects to meet its forecast GHG benchmarks by 2030, so that the project is not expected to result in an increase in GHG emissions. Under Alternative 1, there would be no further increase in electricity associated with the West Oakland Community Action Plan and no increase in GHG due to electricity generation, as none of the Strategies in the Plan would be implemented.

The Plan is expected to result in an overall decrease in GHG emissions associated with incentives for zero and near-zero emission vehicles and for supplying shore power to Schnitzer Steel. The GHG emission reductions were expected to range from 205 to 246 MT/year of CO_2e emissions and outweigh any GHG emission increases associated with implementation of the Plan. Under Alternative 1, the expected GHG emission reductions associated with the Plan would not occur as no Strategies in the Plan would be implemented.

4.5.1.4 Hazards and Hazardous Materials

The hazard impacts associated with implementation of the Plan's strategies are expected to be less than significant, primarily since compliance with numerous existing local, State and federal regulations would minimize the potential impacts associated with the use of ammonia, hydrogen fuel cells, and the cleanup of contaminated sites.

Under Alternative 1, none of the potential Strategies associated with the Plan would be implemented and the potential hazards associated with implementing some of the Strategies, including transport of materials, use of hazardous materials, and handling of hazardous materials associated with a few of the strategies would be eliminated.

4.5.1.5 Utilities and Service Systems

The potential solid and hazardous waste impacts associated with the Plan were determined to be less than significant. Due to the recycling value of materials involved, notwithstanding the increased use of batteries in zero emission vehicles, as well as other types of waste from mobile sources and air pollution control equipment, state reduction goals for solid waste are not impeded, and thus the potential waste impacts were determined to be less than significant. Under Alternative 1, no Strategies would be implemented; therefore, there would be no increase in solid or hazardous waste.

4.5.2 ALTERNATIVE 2 – DISTRICT ONLY STRATEGIES

The impacts under Alternative 2 are expected to be similar to the impacts evaluated for the proposed Plan in this EIR. As discussed in Section 3.2.4, the West Oakland Community Action Plan includes Strategies that would be implemented by other agencies and organizations. Including them in the Plan serves to provide a comprehensive picture of all activities. However, these activities by other agencies are not dependent on approval of the Strategies that are under the authority of the Air District. As these actions by independent agencies will occur independently of the District's approval of the Strategies under their authority, the EIR does not address the implementation of the Strategies that would be implemented by other agencies.

4.5.2.1 Air Quality

Under Alternative 2, only the District Strategies would be implemented. The construction emissions associated with the enclosures would still occur. As discussed in Section 3.2.4.1, construction emissions are not expected to exceed significance thresholds and would not be considered significant. Nonetheless, they would be eliminated under Alternative 2.

The emission benefits associated with ROG, CO, NOx, SOx, PM_{10} and $PM_{2.5}$ under Alternative 2 would be expected to be the same as analyzed for the proposed project in Table 3.2-17, as that table included the evaluation for Strategies that would be implemented by the Air District, for which there is sufficient information to evaluate potential impacts. For the Strategies in the West Oakland Community Action Plan that would be implemented by other agencies and organizations, the emission reductions are unknown at this time but would nonetheless be expected to occur. Under Alternative 2, there would be no further emission reduction benefits from the Strategies in the Plan that would be implemented by other agencies and organizations.

The potential increase in TAC emissions associated with the proposed project were also determined to be less than significant. Further, the proposed project is expected to result in a beneficial reduction in TAC emissions, as well as criteria pollutants. However, it is not possible to estimate the potential TAC emissions reductions at this point until appropriate strategy implementation actions and engineering analyses have been completed and so forth. Nonetheless, electrification of stationary and mobile sources that use diesel, for example, would be expected to result in a decrease in diesel particulate emissions in the West Oakland area. The potential TAC emissions reductions under the proposed project would be expected to be the same as analyzed for the project Plan under Alternative 2.

The TAC emission reductions under the Plan would likely be less under Alternative 2, since the proposed Plan would implement a number of additional Strategies from other agencies than would be implemented under Alternative 2. Therefore, it is doubtful that Alternative 2 would substantially reduce the high cumulative exposure burden of air pollution to the residents of West Oakland.

4.5.2.2 Energy

The West Oakland Community Action Plan would increase the penetration of zero and near-zero vehicles and increase the future demand for electricity in the Bay Area and other areas of California that provide electricity to West Oakland. The Plan would be expected to result in an increase of up to one GWh of electricity (see Table 3.3-3). The potential electricity impacts were determined to be less than significant as it is within the energy forecast and expected electricity production for PG&E.

Under Alternative 2, the potential increase in electricity associated with the West Oakland Community Action Plan would be the same as evaluated under the proposed project, as well as the estimated reduction in the use of gasoline and diesel fuel. It is expected that PG&E would still move forward with electricity sufficient to power up to two million cars due to other state directives. While sufficient information was not available to evaluate the impacts associated with Strategies that would be implemented under the Plan by other agencies, the energy increases under the Plan would likely be greater than under Alternative 2, since the proposed Plan would implement a number of additional Strategies from other agencies than would be implemented under Alternative 2.

4.5.2.3 Greenhouse Gases

The West Oakland Community Action Plan would increase the penetration of zero and near-zero vehicles, increasing the generation of electricity and potentially increase GHG emissions associated with generating electricity. The potential increase in electric vehicles as part of Strategies in the Plan is within the range of vehicles that PG&E has forecast for its service area of two million vehicles. PG&E expects to meet its forecast GHG benchmarks by 2030, so that the project is not expected to result in an increase in GHG emissions. Under Alternative 2, the increase in electricity would be expected to be similar as that analyzed for the project. There could be additional electricity requirements under the proposed project because strategies would be implemented by other agencies and some of those would be expected to have additional electricity requirements.

The Plan is expected to result in an overall decrease in GHG emissions associated with incentives for zero and near-zero emission vehicles and for supplying shore power to Schnitzer Steel. The GHG emission reductions were expected to range from 205 to 245 MT/year of CO_2e emissions and outweigh any GHG emission increases associated with implementation of the Plan. Under Alternative 2, the expected GHG emission reductions associated with the Plan would be expected to be the same at this time, as the impacts associated with Strategies in the Plan that would be completed by other agencies is unknown.

4.5.2.4 Hazards and Hazardous Materials

The hazard impacts associated with implementation of the Plan are expected to be less than significant, primarily since compliance with numerous existing local, State and federal regulations would minimize the potential impacts associated with the use of ammonia, hydrogen fuel cells, and the cleanup of contaminated sites.

Under Alternative 2, the same strategies that were evaluated for the proposed project would be implemented under Alternative 2. The impacts associated with the use of ammonia, hydrogen fuel cells and from the cleanup of contaminated sites would be the same as the proposed project and less than significant. Therefore, hazard impacts under Alternative 2 would be less than significant.

4.5.2.5 Utilities and Service Systems

The potential solid and hazardous waste impacts associated with the Plan were determined to be less than significant. Due to the recycling value of materials involved, notwithstanding the increased use of batteries in zero emission vehicles, as well as other types of waste from mobile sources and air pollution control equipment, state reduction goals for solid waste are not impeded, and thus the potential waste impacts were determined to be less than significant. Under Alternative 2, the impacts on solid and hazardous waste would be expected to be the same because the same Strategies evaluated for the project would be implemented under Alternative 2; therefore, the impacts on utilities and service systems would be less than significant.

4.6 CONCLUSION

Alternative 1 – the No Project Alternative would theoretically reduce the potential construction emissions associated with implementing the Plan. Further, there would be no criteria pollutant or TAC emission reductions achieved under Alternative 1. Alternative 1 is not feasible due to legal factors, as it would violate the requirements of AB 617. Further, Alternative 1 would not achieve any of the project objectives.

The impacts under Alternative 2 would essentially be the same as the proposed project because all of the proposed Strategies that are within the Air District's jurisdiction would be implemented under Alternative 2. However, under Alternative 2, there would be no further emission reduction benefits from the Strategies in the Plan that would be implemented by other agencies and organizations. Alternative 2 would result in some emissions reductions if all of the Air District's strategies were implemented and would partially achieve the project objectives of reducing criteria and TAC emissions and the related exposure. However, Alternative 2 would not be expected to achieve the goals and targets under the West Oakland Community Action Plan and would likely require that additional emission reduction Strategies be implemented. Moreover Alternative 2 would fail to be consistent with the intent of AB 617 for regional air districts to work together with local community groups, agencies, and individuals in ameliorating air pollution in overburdened local communities like West Oakland.

4.7 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. Table 4-2 provides this matrix comparison displaying the major characteristics and significant environmental effects of each alternative. Table 4-2 lists the alternatives considered in this EIR and how they compare to the proposed project. Table 4-2 presents a matrix that lists the significant adverse impacts as well as the cumulative impacts associated with the proposed project and the project alternatives for all environmental topics analyzed. The table also ranks each section as to whether the proposed project or a project alternative would result in greater or lesser impacts relative to one another.

As shown in Table 4-2, Alternative 1 would reduce potential impacts associated with the proposed project as no Strategies in the Plan would be implemented. Alternative 1 would also eliminate any criteria or TAC emission reductions and eliminate the beneficial impacts of the Plan and would not achieve any of the project objectives. Alternative 2 would have essentially the same impacts as the proposed project because the same Strategies evaluated as part of the project would be implemented under Alternative 2. Alternative 2 would not result in any significant impacts and would be expected to achieve some of the emission reductions in the project objectives, but not all. Alternative 2 would be considered the environmentally superior alternative as it would achieve more of the project objectives and emissions reductions than Alternative 1.

The proposed project would be considered the preferred alternative as it would be expected to achieve all of the project objectives and emission reductions associated with the implementation of the Plan and would be expected to reduce the emissions and related health impacts to the West Oakland Community more effectively than Alternative 2. Therefore, the proposed project is the preferred alternative.

TABLE 4-2

COMPARISON OF ALTERNATIVES

ENVIRONMENTAL TOPIC	Proposed Project	Alternative 1 No Project Alternative	Alternative 2 District Only Strategies
Air Quality			
Construction Emissions	NS	NS (-)	NS (=)
Operational Criteria Pollutants	NS	NS (-)	NS (=)
Toxic Air Contaminants	NS	NS (-)	NS (=)
Emission Reduction Benefits	B	No benefit	B(-)
Cumulative Air Quality Impacts	NS	NS (-)	NS (=)
Energy			
Electricity Use	NS	NS (-)	NS (=)
Cumulative Energy Impacts	NS	NS (-)	NS (=)
Greenhouse Gas Emissions			
GHG Impacts	NS	NS (-)	NS (=)
Cumulative GHG Emissions	NS	NS (-)	NS (=)
Hazards and Hazardous Materials			
Operational Hazard Impacts	NS	NS (-)	NS (=)
Transportation Hazard Impacts	NS	NS (-)	NS (=)
Cumulative Hazards Impacts	NS	NS (-)	NS (=)
Utilities and Service System Impacts			
Solid Waste Impacts	NS	NS (-)	NS (=)
Hazardous Waste Impacts	NS	NS (-)	NS (=)
Cumulative Utilities Impacts	NS	NS (-)	NS (=)

Notes:
NS = Less than significant
B = Beneficial Impact
(-) = 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

This page intentionally left blank.

5.1 REFERENCES

AFDC, 2016a. Batteries for Hybrid and Plugin Electric Vehicles. Accessed August 14, 2016. http://www.afdc.energy.gov/vehicles/electric_batteries.html

Association of Bay Area Governments (ABAG), 2017. Plan Bay Area 2040. Draft Environmental Impact Report. April 2017. SCH#2016052041

BAAQMD, 2015. Bay Area Emission Inventory Summary Report: Greenhouse Gases, January 2015.

BAAQMD, 2017. FEIR for the Draft 2017 Clean Air Plan: Spare the Air, Cool the Climate: A Blueprint for Clean Air and Climate Protection in the Bay Area. Accessed August, 2017. http://www.baaqmd.gov/~/media/files/planning-and-research/plans/2017-clean-air-plan/attachment-a_-proposed-final-cap-vol-1-pdf.pdf?la=en

BAAQMD, 2017a. BAAQMD CEQA Air Quality Guidelines. Accessed October 2, 2018. http://www.baaqmd.gov/~/media/files/planning-and-research/ceqa/ceqa_guidelines_may2017-pdf.pdf?la=en

BAAQMD, 2018. Air Monitoring Data. Accessed October 2, 2018. http://www.baaqmd.gov/about-air-quality/current-air-quality/air-monitoring-data?DataViewFormat=daily&DataView=aqi&StartDate=10/2/2018&ParameterId=59

CARB, 2011. OFFROAD2011: 2011 Off-road Inventory Model. https://www.arb.ca.gov/msei/off-road-emissions-inventory-v3-scenpop-and-hp.mdb.

CARB, 2014. EMFAC2014 Web Database. Sacramento, CA. Accessed October, 2018. https://www.arb.ca.gov/emfac/2014/

CARB, 2018. California Greenhouse Gas Emissions for 2000 to 20016, Trends of Emissions and Other Indicators. Accessed June 11, 2019. https://www.arb.ca.gov/cc/inventory/pubs/reports/2000_2016/ghg_inventory_trends_00-16.pdf

CARB, 2019. Sales of electric cars break records in California. Accessed 6/24/19. Available at https://ww2.arb.ca.gov/news/sales-electric-cars-breaking-records-california

California Energy Commission (CEC), 2019a. Total System Electric Generation. https://www.energy.ca.gov/almanac/electricity_data/total_system_power.html (accessed May 28, 2019).

California Energy Commission (CEC), 2019b. Annual Generation – Plant Unit. https://www.energy.ca.gov/almanac/electricity_data/web_qfer/Annual_Generation-Plant_Unit.php (accessed May 28, 2019).

California Energy Commission (CEC), 2019c. Electricity Consumption by County. http://www.ecdms.energy.ca.gov/elecbycounty.aspx (accessed May 28, 2019).

California Energy Commission (CEC), 2019d. Status of All Projects. https://www.energy.ca.gov/sitingcases/all_projects.html (accessed May 28, 2019).

California Fuel Cell Partnership, 2019. Hydrogen Fuel Stations. Accessed 6/24/19. Available at: https://cafcp.org/

Clean Harbors, 2015. Personal communication with Les Ashwood, Clean Harbors 435-884-8967, October 16, 2015.

CalRecycle, 2019a. Multi-year Countywide Destination Summary. https://www2.calrecycle.ca.gov/LGCentral/DisposalReporting/Destination/CountywideSummary (accessed May 20, 2019)

CalRecycle, 2019b. Solid Waste Information System (SWIS) Facility/Site Search. https://www2.calrecycle.ca.gov/swfacilities/Directory (accessed May 20, 2019)

DTSC, 2019a. DTSC Envirostor data base on Kettleman Hills Hazardous Waste Facility. https://www.envirostor.dtsc.ca.gov/public/hwmp_profile_report?global_id=CAT000646117&starttab= (accessed June 10, 2019).

Department of Toxic Substances (DTSC), 2019b. Hazardous Waste Tracking System, Total Yearly Tonnage by Waste Code. https://hwts.dtsc.ca.gov/report_search.cfm (accessed May 24, 2019).

East Bay Times, 2018. Pittsburg Power Plant Restarts Full Operations, Reclaims Title of Largest in Bay Area. Aaron Davis. https://www.eastbaytimes.com/2018/02/26/pittsburg-power-plant-restarts-full-operations-reclaims-title-of-largest-in-bay-area/ (accessed May 29, 2019).

Edmunds, 2014. What Happens to EV and Hybrid Batteries? Going Green with Battery Recycling. John O'Deil. Updated August 24, 2014. Accessed February 14, 2017. http://www.edmunds.com/fuel-economy/what-happens-to-ev-and-hybrid-batteries.html

Green Car Reports, 2016. Electric-Car Batteries: What Happens to Them After Coming Out of the Car? By John Voelcker, August 12, 2014. Accessed August 17, 2016 at: http://www.greencarreports.com/news/1093810_electric-car-batteries-what-happens-to-them-after-coming-out-of-the-car.

Harley, Robert, 2012. Diesel Truck Emissions in Oakland Fall Sharply. Berkeley Institute of Transportation Studies, Winter 2012. Available at: http://its.berkeley.edu/btl/2012/winter/harley

Mineta National Transit Research Constortium (MNTRC), 2014. Remanufacturing, Repurposing, and Recycling of Post-Vehichle-Application Lithium-Ion Batteries. Mineta National Transit Research Consortium. June 2014.http://transweb.sjsu.edu/project/1137.html

Morello-Frosch, Rachel, Lara Cushing, Dan Blaustein-Rejto, Madeline Wander, Manuel Pastor, James Sadd, and Allen Zhu., 2016. Carbon Trading, Co-Pollutants, and Environmental Equity: Evidence from California's Cap-and Trade Program (2011-2015). PLOS Medicine

Office of Emergency Services (OES), 2019. 2018 HazMat Spill Reports. Accessed May 30, 2019 at https://www.caloes.ca.gov/FireRescueSite/pages/spill-release-reporting.aspx

Pacific Gas & Electric (PG&E), 2018. Integrated Resource Plan, 2018. Prepared for the California Public Utilities Commission, August 1, 2018. Available at: https://www.pge.com/pge_global/common/pdfs/for-our-business-partners/energy-supply/integrated-resource-planning/2018-PGE-Integrated-Resource-Plan.pdf

Retriev Technologies, 2019. Retriev Technologies – Lithium Ion battery services. Accessed June 19, 2019. https://www.retrievtech.com/lithiumion

C. Rivkin, R. Burgess, and W. Buttner, 2015. Hydrogen Technologies Safety Guide. National Renewable Energy Laboratory, Technical Report NREL/TP-5400-60948, January 2015. Accessed 6/24/19. Available at: https://www.nrel.gov/docs/fy15osti/60948.pdf

South Coast Air Quality Management District (SCAQMD), 2006. SCAB Fleet Average Emission Factors. http://www.aqmd.gov/docs/default-source/ceqa/handbook/emission-factors/off-road-mobile-source-emission-factors-(scenario-years-2007-2025).xls?sfvrsn=2.

SCAQMD, 2015b. Staff Report for SCAQMD Rule 1401.1 – Requirements for New and Relocated Facilities Near Schools, and SCAQMD Rule 1402 – Control of Toxic Air Contaminants from Existing Sources. Accessed online at: http://www.aqmd.gov/docs/default-source/Agendas/Governing-Board/2015/2015-jun1-028.pdf?sfvrsn=9

SCAQMD, 2017. 2016 Air Quality Management Plan (AQMP). Accessed June 14, 2019. https://www.aqmd.gov/home/air-quality/clean-air-plans/air-quality-mgt-plan/final-2016-aqmp

U.S. EPA, 2016. Greenhouse Reporting Program 2014: Reported Data. Accessed July 2016. https://www.epa.gov/ghgreporting/ghgrp-2014-reported-data.

U.S. EPA, 2018. Air Quality System (AQS). https://www.epa.gov/aqs

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.

Yvette DiCarlo
Victor Douglas
Areana Flores
Josephine Fong
Joel Freid
Andrea Gordon
Henry Hilken
Alison Kirk
Ada Márquez
David Ralston
Stephen Reid

5.3 LIST OF ENVIRONMENTAL IMPACT REPORT PREPARERS

Bay Area Air Quality Management District
San Francisco, California

Environmental Audit, Inc.
Placentia, California

APPENDIX A

NOTICE OF PREPARATION AND INITIAL STUDY

[This page intentionally left blank.]

Notice of Preparation

Bay Area Air Quality Management District

AB 617 West Oakland Community Action Plan

Draft Environmental Impact Report (EIR)

To:	Interested Agencies, Organizations and Individuals
Project:	AB 617 West Oakland Community Action Plan – Draft Environmental Impact Report
Location:	City of Oakland, California
Lead Agency:	Bay Area Air Quality Management District
Comment Period:	May 14, 2019 to June 14, 2019

Interested agencies, organizations and individuals are invited by the Bay Area Air Quality Management District (Air District) to comment on the scope and content of the environmental impact report that will be prepared for the AB 617 West Oakland Community Action Plan in compliance with the California Environmental Quality Act (CEQA). Assembly Bill (AB) 617 (C. Garcia 2017) requires the adoption and implementation of community emissions reduction plans for identified jurisdictions with disproportional impacts from air pollution. Pursuant to AB 617, the proposed plan includes strategies at the local community level to maximize emission reductions and reduce residents' cumulative exposure to criteria air pollutants and toxic air contaminants. The West Oakland Community Action Plan is an integrated, multi-pollutant, community air quality plan to eliminate and reduce health risk disparities in West Oakland. The Air District and the West Oakland Environmental Indicators Project jointly developed the proposed plan for the West Oakland community.

The Air District is the lead agency undertaking the AB 617 West Oakland Community Action Plan and the preparation of a program-level Draft Environmental Impact Report (EIR) for that Plan. The AB 617 Plan identifies 80 potential control measures and strategies to reduce air pollution from a variety of stationary and mobile sources located in West Oakland, including the Port of Oakland. The purpose of this Notice of Preparation (NOP) is to seek comments about the scope and content of the environmental impact report that will be prepared for the Plan.

Written comments on the AB 617 West Oakland Community Action Plan will be accepted until June 14, 2019 via email or mail to:

Ada E. Márquez
Principal Environmental Planner
Bay Area Air Quality Management District
375 Beale Street, Suite 600
San Francisco, CA 94105
amarquez@baaqmd.gov

[This page intentionally left blank.]

CHAPTER 1

PROJECT DESCRIPTION

[This page intentionally left blank.]

1.0 PROJECT DESCRIPTION

1.1 INTRODUCTION

Assembly Bill (AB) 617 (C. Garcia, Chapter 136, Statutes of 2017) asks communities and air districts to work together to address air pollution and related health effects in overburdened communities like West Oakland. AB 617's community-focused approach provides a new framework for addressing the long-standing disparities in air pollution and related health effects across the state.

AB 617 requires the adoption and implementation of community emissions reduction plans for targeted jurisdictions with disproportionate impacts from air pollution. Pursuant to AB 617, the Bay Area Air Quality Management District (Air District) and the West Oakland Environmental Indicators Project jointly developed a community emissions reduction plan, referred to as the Community Action Plan, for West Oakland. The proposed plan includes strategies at the community level to maximize emission reductions and reduce residents' cumulative exposure to criteria air pollutants, diesel particulate matter (Diesel PM), fine particulate matter ($PM_{2.5}$), and toxic air contaminants. The West Oakland Community Action Plan is an integrated multi-pollutant community air quality plan to eliminate health risk disparities in West Oakland. This Community Action Plan documents the Steering Committee's effort to study air pollution in West Oakland, and to identify and to prioritize Action Strategies that once implemented, will work towards eliminating West Oakland's air pollution burden.

The government agencies with primary responsibility for implementing the strategies in the Community Action Plan include the City of Oakland, Port of Oakland, Alameda County Public Health Department, Air District, and California Air Resources Board.

1.2 AGENCY AUTHORITY

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 this project and has prepared the Notice of Preparation/Initial Study for the proposed West Oakland Community Action Plan.

The Lead Agency is the "public agency that has the principal responsibility for carrying out or approving a project that may have a significant effect upon the environment" (Public Resources Code Section 21067). It was determined that the Air District has the primary responsibility for supervising or approving the project as a whole and is the most appropriate public agency to act as lead agency (CEQA Guidelines Section 15051(b)).

1.3 PROJECT LOCATION

The Air District 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 1).

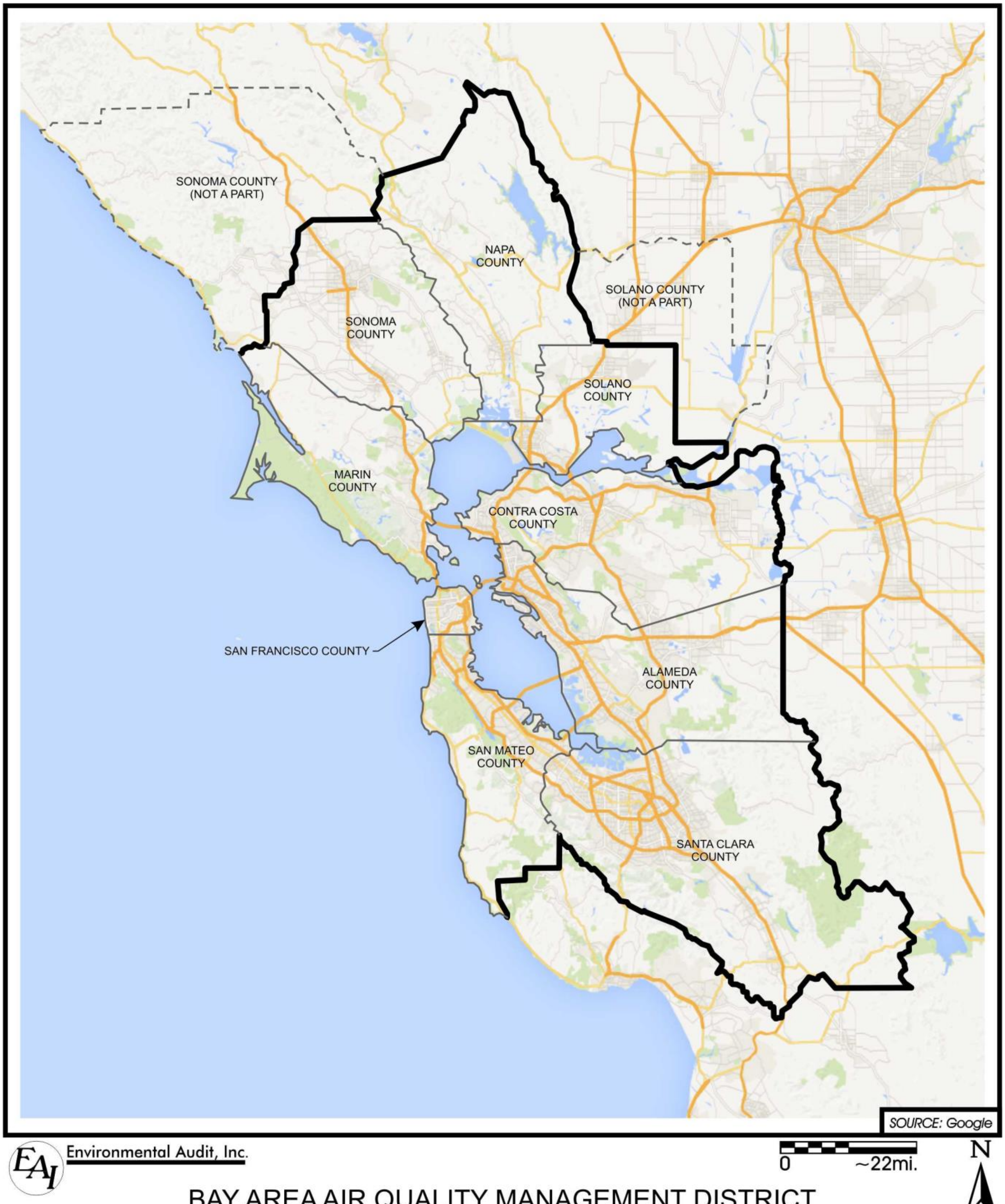
The proposed Community Action Plan will apply to West Oakland, which is part of the City of Oakland (see Figure 2). West Oakland is bounded by the Port of Oakland, the Union Pacific rail yard, and Interstates 80, 580, 880, and 980 (see Figure 3).

1.4 PROJECT BACKGROUND

AB 617 directs the state's California Air Resources Board (CARB), in consultation with local air districts, to identify and select communities that have a high cumulative exposure burden to air pollution. Once selected, these communities will work with local air districts on community emission reduction programs and/or air quality monitoring requirements. With the adoption of AB 617, the state acknowledges that many communities around the state continue to experience disproportionate impacts from air pollution. AB617 requires all of the following and more:

1. Air Districts in nonattainment areas must implement Best Available Retrofit Control Technologies (BARCT) on all sources subject to the AB 32 Cap-and-Trade Program. The Air District approved their BARCT requirements in December 2018.
2. CARB must establish and maintain a clearinghouse of best available control technology (BACT), and BARCT.
3. Air pollution violation maximum penalties were increased and will adjust with inflation.
4. CARB was required to prepare an air monitoring plan for all areas of the state by October 1, 2018.
5. Based on air monitoring plan information, CARB must select communities with high cumulative exposure burden to both toxic and criteria air pollutants by July 1, 2019.
    a. Each air district with a high cumulative burden community must deploy a community air monitoring system in that community within one year, and provide the air quality data to CARB for publication.
6. By January 1, 2020, and each January 1 thereafter, CARB will select additional communities with high cumulative exposure burden.

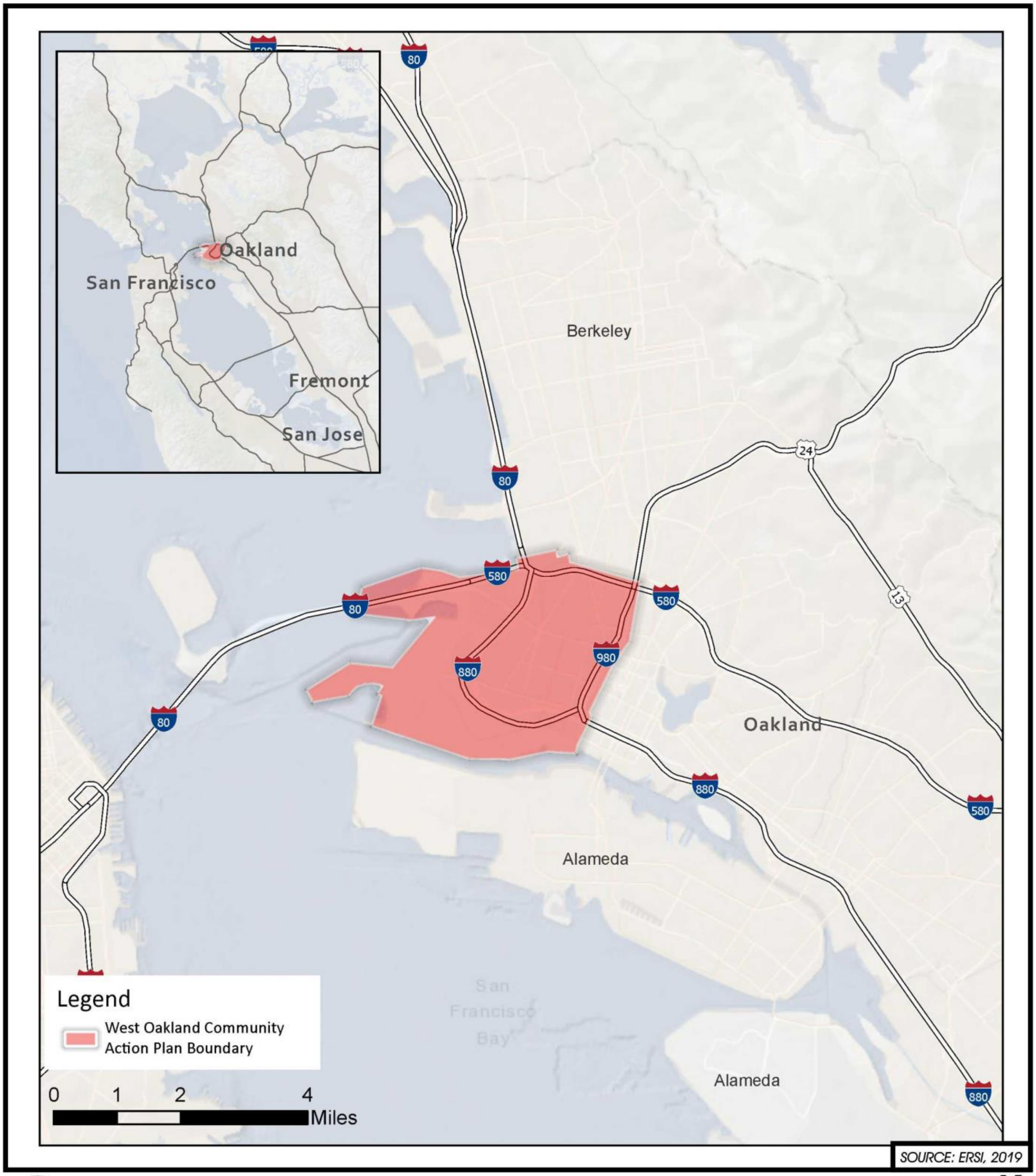
a. Each air district with a high burden community must deploy a community air monitoring system in that community within one year, and provide the air quality data to CARB for publication.



BAY AREA AIR QUALITY MANAGEMENT DISTRICT
JURISDICTION

Project No. 3100 Figure 1

N:\3100\BAAQMD Map.cdr



WEST OAKLAND COMMUNITY ACTION PLAN
REGIONAL AND VICINITY MAP

Project No. 3100

Figure 2

N:\3100\Regional Map.cdr

Environmental Audit, Inc.

WEST OAKLAND COMMUNITY ACTION PLAN
PLANNING BOUNDARY

Project No. 3100

Figure 3

N:\3100\Planning Boundary.cdr

7. CARB must prepare a state-wide strategy to reduce emissions of toxic and criteria pollutants in communities affected by high cumulative exposure burden, by October 1, 2018, and update the strategy every five years. Criteria for the state-wide strategy recognized that disadvantaged communities and sensitive receptors are a priority, and include:
    a. A methodology for assessing and identifying contributing sources, and estimating their relative contribution to elevated exposure (source apportionment).
    b. Assessment of whether an air district should update and implement the risk reduction audit and emissions reduction plan for any facility if the facility causes or significantly contributes to the high cumulative exposure burden.
    c. Assessment of available measures for reducing emissions including BACT, BARCT, and toxics best available control technology (TBACT).
8. CARB selected locations for preparation of Community Emission Reduction Plans by October 1, 2018. CARB will select additional locations annually thereafter.
    a. Within one year, the air districts will adopt Community Emission Reduction Plans in consultation with CARB, individuals, community-based organizations, affected sources, and local governmental bodies.
    b. By October 2019, air districts adopt programs in first-year communities selected for community emissions reduction programs.
    c. The air districts' deadline to adopt the community emissions reduction programs is one year from community selection, which is October 1, 2019 for the first set of communities selected.
    d. The Community Emission Reduction Plans must be consistent with the state-wide strategy, and include emission reduction targets, specific reduction measures, a schedule for implementation of the measures, and an enforcement plan.
    e. The Community Emission Reduction Plans must be submitted to CARB for review and approval.
    f. The Community Emission Reduction Plans must achieve emission reductions in the community, based on monitoring or other data.
    g. The air districts must prepare an annual report summarizing the results and actions taken to further reduce emissions.
9. CARB will provide grants to community-based organizations for technical assistance and to support community participation in identification of communities with high exposure burden, and development and implementation of the Community Emission Reduction Plans.

AB 617 represents a significant enhancement to the approach CARB and local air districts take in addressing local air quality issues. The Air District has begun implementing programs that follow on from AB 617; these programs include the Community Air Risk Evaluation (CARE) Program, Health Risk Assessments for the AB 2588 Air Toxics "Hot Spots" Program, and Air District Rule 11-18: Reduction of Risk from Air Toxic Emissions at Existing Facilities. However, AB 617 presents myriad requirements and establishes challenging goals and timelines for implementation.

In August 2018, the District submitted the Community Health Protection Program to CARB which recommended the communities for the first five years of the state's Community Air Protection Program. The Air District recommended that West Oakland be eligible for a Community Action Plan in the first year of the AB 617 program. Maritime-freight industries, rail, large distribution centers, a cement plant, a power plant, metal facilities, small to medium industrial and manufacturing operations, major freeways and busy roadways used as trucking routes all impact the West Oakland community. These sources contribute to high levels of particulate matter less than 2.5 microns in diameter ($PM_{2.5}$) concentrations and elevated cancer risk from toxic air contaminants. West Oakland is considered one of the most impacted areas in the San Francisco Bay Area due to the area's many sources of diesel particulate matter. As such, CARB approved West Oakland as a first-year priority community in the Bay Area. In addition, CARB approved Richmond for a Community Air Monitoring Plan. The currently proposed project will implement the required community emission reduction plan required under AB 617, which is referred to as the West Oakland Community Action Plan herein.

1.5 PROJECT DESCRIPTION

The West Oakland Community Action Plan is a joint effort between the West Oakland Environmental Indicators Project (Indicators Project) and the Air District, with direction from the West Oakland Community Action Plan Steering Committee. The West Oakland Environmental Indicators Project has a long history of community planning and advocacy to reduce residents' exposure to diesel particulate matter (Diesel PM), fine particulate matter ($PM_{2.5}$), and toxic air contaminants (TACs). The Steering Committee members are local stakeholders, including residents, community and local business leaders, and government agency representatives.

The Community Action Plan was developed through monthly meetings with the West Oakland Steering Committee, which began working on the Plan in July 2018. The Plan provides strategies for addressing the long-standing disparities in air pollution and related health effects in West Oakland. Once implemented, the Plan will work towards eliminating West Oakland's air pollution burden.

The goal of the Community Action Plan is to reduce emissions from air pollution sources within and adjacent to West Oakland air pollution sources, including:

- Stationary sources in West Oakland and adjacent to West Oakland, such as the East Bay Municipal Utility District wastewater treatment plant; recycling facilities such as Schnitzer Steel, CASS, and California Waste Solutions, Incorporated; gas stations, back-up diesel generators, and auto-body shops;
- Mobile sources, such as heavy-duty trucks and light-duty vehicles that travel in West Oakland and on the surrounding freeways; and
- Mobile sources that serve the Port of Oakland, such as cargo equipment, port trucks, locomotives, ocean-going ships, and harbor craft in the San Francisco Bay.

A summary table is provided at the end of this Chapter One as Appendix A that identifies the proposed strategies included in the Community Action Plan. A summary of those strategies is provided below.

1.5.1 Stationary Source Strategies

The Plan includes strategies to further control emissions from stationary sources in West Oakland. Strategies to control stationary sources to include considering: (1) replacing stationary diesel engines with Tier 4 diesel or cleaner engines; (2) reformulation of vanishing oils and rust inhibitors; (3) reducing toxic air contaminant emissions from existing industrial sources including Schnitzer Steel and the East Bay Municipal Utility District's Wastewater Treatment Plant; (4) potential new or amended regulations to further reduce emissions from metal recycling and foundry operations; (5) developing a regulation to reduce emissions of reactive organic gases and other toxic compounds from organic liquid storage tanks; and (6) identifying incentives to emissions from waste water treatment plants and anaerobic digestion facilities. The District may also consider developing an indirect source regulation to reduce emissions from freight operations.

1.5.2 Mobile Source Strategies

The Plan includes strategies to reduce emissions from mobile sources including vehicles, trucks, locomotives, and ships. A number of strategies would encourage the early retirement of old vehicles, the use of renewable fuels or increase the use of zero-emissions trucks, buses, and vehicles operating in West Oakland. Strategies to control emissions from locomotives and ships include: (1) increasing the use of shore-power or other emission control systems by vessels at berth in the Port of Oakland; (2) encouraging use of Tier 3 and 4 compliant diesel engines on tugs and barges; and (3) encouraging use of Tier 4 compliant engines on locomotives. A number of strategies would increase enforcement on a variety of different activities including illegal parking, excess idling, and not using appropriate truck routes.

1.5.3 Other Mobile Source Strategies

The Plan encourages other strategies to reduce emissions from mobile sources including: (1) encouraging car sharing for low-income individuals; (2) providing pedestrian and bicycle improvements to increase use of public transit, e.g., BART; (3) increasing street sweeping to minimize the re-entrainment into the air of particulates that collect on streets and freeways; (4) developing safe routes to school to minimize conflicts between pedestrians and trucks/vehicles; and (5) considering improvements to public transit along Grand Avenue.

1.5.4 Land Use Strategies

Land use strategies are aimed at modifying land uses to limit exposure to emissions. Under this category, the Plan includes strategies to reduce exposure to emissions by: (1)

relocating California Waste Systems and CASS to move sources away from sensitive receptors; (2) accelerating the relocation of auto and truck-related businesses that are non-conforming land uses; (3) developing regulations to prohibit certain freight businesses and truck yards in portions of West Oakland; (4) increasing urban tree planting and vegetative biofilters along streets/truck routes to help reduce exposure to emissions; (5) adopting development impact fees to fund various environmental mitigations including green infrastructure and transportation improvements; (6) installing solid barriers between buildings and air pollution sources (e.g., freeways) to reduce exposure to air pollution; (7) increasing electrical infrastructure to encourage zero emissions vehicles/trucks; and (8) improving and updating the complaint processes, enforcement procedures and coordination with other public agencies to better respond to odors and open burning complaints.

1.5.5 Health Programs

Health Program strategies are aimed at generally reducing exposure to air pollution. These strategies could include: (1) the installation of high efficiency air filtration systems on buildings to reduce exposure; (2) relocating exhaust stacks to reduce local exposure to air pollutants; (3) providing additional air monitoring to better detect sources of air pollution; and (4) better reporting of health data to identify public health impacts, as well as improvements.

Implementation of the Community Action Plan, once approved, will be the responsibility of a number of governmental agencies including the City of Oakland, Port of Oakland, Alameda County Public Health Department, Air District, and California Air Resources Board. Please see Appendix A for a list and description of all the proposed strategies in the West Oakland Community Action Plan.

1.6 OVERVIEW OF ANALYTICAL APPROACH

The West Oakland Community Action Plan is designed to be a comprehensive Plan for the District and other agencies and community groups to use to implement strategies to reduce West Oakland residents' exposure to diesel PM, $PM_{2.5}$, and TAC emissions. To implement the Plan, the Air District and other agencies and organizations propose to draw on a full repertoire of tools and resources. This repertoire includes the District's principal regulatory tool, which is its rulemaking authority granted to it under the California Health & Safety Code to adopt mandatory regulations requiring stationary-source facilities to take action to reduce their air emissions. It also includes the District's grants and incentives programs, which provide monetary incentives for implementing voluntary actions to reduce emissions. And it also includes the District's role in promoting sound policy development and healthy air choices throughout all sectors of our economy and society. This last tool encompasses efforts such as providing technical support to other agencies as they develop and implement their own policies and programs to help achieve clean air; promoting best practices by developing model ordinances, guidance documents and other similar documents; outreach and education efforts to engage with community groups and other organizations; and advocacy in support of legislative and regulatory action at the federal, state and local levels to promote the District's air quality and public health goals.

To facilitate the analysis of the potential impacts from implementation of the strategies in the Community Action Plan, the District has organized the strategies into four categories; (1) stationary-source regulatory actions; (2) grants and incentive actions; (3) technical support, education outreach, and advocacy actions; and (4) strategies to be implemented by other agencies. The following discussion outlines each of these categories in general.

1.6.1 Stationary Source Regulatory Action

The principal type of activity that the Air District will engage in under the West Oakland Community Action Plan is to explore, research and/or adopt, if appropriate, mandatory regulations and rules requiring stationary-source facilities to take actions to reduce their air emissions, pursuant to the District's rulemaking authority under the California Health & Safety Code. The enhanced rules and regulations that the Air District proposes to develop under the Community Action Plan will help to reduce emissions in West Oakland. These proposed regulatory measures are evaluated to determine whether they could also result in any significant ancillary adverse environmental impacts.

The West Oakland Community Action Plan proposes a number of control strategies that would reduce emissions of diesel PM, $PM_{2.5}$, and TAC emissions. Potential stationary source strategies include reducing reactive organic gas (ROG) and TAC emissions from organic liquid storage tanks; reducing emissions from the use of vanishing oils; new regulations to control emissions from wastewater treatment plants; modification to existing regulations to further reduce emissions from metal recycling and foundry operations; and installing shore-power or a "bonnet" system on ships that visit the Schnitzer Steel marine terminal. The potential impacts of these types of control strategies are evaluated in Chapter 2 of the Initial Study as their implementation could result in physical impacts.

In addition to new and modified rules and regulations, some of the Air District's proposed stationary source regulatory actions will enhance enforcement of existing regulations. These regulatory actions do not require any new or modified equipment at any facilities and as such, they are not expected to result in adverse physical environmental impacts. Action #21 which would create a Sustainable Freight Advisory Committee, that could include enhance enforcement of truck parking and idling, and which would also result in improved referral and follow-up of nuisance and odor complaints, both fall into this category of no adverse impacts. As this measure would not have any physical environmental impacts, it not addressed in the subsequent environmental analysis.

For a number of other proposed stationary source control measures, it is not clear at this point what type of regulatory action (if any) the Air District may take to implement them. For example, several control strategies involve potential rules where further study is needed to determine whether it is possible to obtain additional emissions reductions, and if so, how would that be accomplished. Such measures include Action #2 to further control emissions from storage tanks, and Action #3 to control emissions from autobody and other coating operations, including vanishing oils and rust inhibitors.

For these types of measures, it is not possible to evaluate with any specificity whether there may be a significant environmental impacts arising from the Air District's implementation actions, as the implementation actions themselves and/or any resulting physical changes to the environment are not yet known with any specificity. In such situations, CEQA does not require a CEQA document to engage in speculation about what might or might not occur from such strategies. CEQA Guidelines Section 15145 provides that "[i]f, after thorough investigation, a lead agency finds that a particular impact is too speculative for evaluation, the agency should note its conclusion and terminate discussion of the impact." Accordingly, speculative implementation strategies of this type are not addressed in detail in the environmental analyses. The Air District has projected what implementation of the Community Action Plan may involve as precisely as is reasonably possible at the current stage of development and, wherever there are specific implementation actions and specific physical changes to the environment that are likely or reasonably possible to occur, they and their environmental impacts are evaluated in detail. But where it is not possible at this stage to project the nature or extent of an implementation action or any resulting environmental impacts beyond mere speculation, they are not evaluated, and indeed cannot be evaluated, in accordance with CEQA Guidelines Section 15145. In addition to the examples cited above, other measures which are considered too speculative to determine if nay environmental impacts might occur at this stage include Action #18 (air pollution and health outcomes of allowing truck traffic on I-580 and a truck lane on I-880); Action #65 (shortcut nitrogen removal from wastewater treatment plants); as well as some of the measures that would encourage zero emission mobile sources.

1.6.2 Grants and Incentives

In addition to the stationary source regulatory measures proposed as part of the Community Action Plan, the Air District is also proposing to use its grants and incentives programs to fund projects in furtherance of the Plan's goals of reducing air pollution and protecting public health. The main vehicle for funding strategies is the Air District's Transportation Fund for Clean Air (TFCA), which funds cost-effective projects aimed at reducing on-road motor vehicle emissions in the Bay Area, including vehicle replacement projects that fund the replacement of older, higher-emitting vehicles with cleaner zero emission vehicles or partial zero emission vehicles. Other sources of grants include the Carl Moyer Program, the Mobile Source Incentive Fund, and the Goods Movement Program.

The Air District is proposing to use the grants and incentive program to further the Plan's goals of reducing emissions in West Oakland. These control strategies call for using grant funding to target emissions reductions to be obtained from the transportation section, either by promoting emissions-free alternatives to motor vehicle travel such as walking and bicycling, or by promoting less-polluting vehicular transportation such as zero-emission mobile sources and public transit. In Strategy #41, the Air District would use up to $7 million per year to replace older autos through the Vehicle Buy Back program and, up to $4 million per year through the Clean Cars for All program to replace older autos and provide an incentive for a zero emission vehicle or to get a Clipper Card for public transit.

A number of other strategies would also provide financial incentives to reduce emissions including loans for local businesses to install energy storage systems to replace stationary sources of pollution (e.g., back-up generators) (Strategy #14); financial incentives to replace diesel trucks with zero emission trucks (Strategy #42); streamlining the process for funding for fueling infrastructure for low/zero emission equipment (Strategy #46); financial incentives to upgrade tugs, barges, and locomotives with cleaner engines (Strategy #59 and #60); financial incentives to support development of hydrogen refueling stations and the purchase of trucks and off-road equipment powered by fuel cells (Strategy #45); financial incentives for the purchase of electric bicycles (Strategy #50); financial incentives to pay for cleaner equipment, e.g., electric lawn and garden equipment, batteries for transportation refrigeration units, and cargo-handling equipment (Strategy #47); financial incentives to replace diesel trucks with zero emission trucks (Strategy #42); and incentives and grants for building energy efficiency upgrades and high efficiency air filtration systems (Strategy #69).

For these types of implementation actions, it is only possible to evaluate the Plan's potential environmental impacts in highly general terms. Strategies #15 and 18 may require construction activities to install electric charging stations, for example, but more information on the location and number of stations is needed to evaluate the magnitude of the impacts. Strategies #27, 41-47, 60, and 63 could fund the purchase and replacement of older internal combustion engines with newer engines. The disposal of older engines, vehicles, trucks, etc., could have an adverse impact associated with removing hazardous waste (anti-freeze, gasoline, oil) from the vehicles, but more information is needed specifically about how and where such activities would occur before a detailed analysis of potential impacts could be conducted. In addition, if electric vehicles are purchased with the grant funding there could be potential impacts associated with electricity production and supply. However, it is not possible to evaluate whether there could be any environmental impacts from individual projects the Air District might fund, or the nature and extent of any such impacts, as there are no specific projects at this point that have been proposed for grant funding and the availability of the funding, in most cases, is unknown. Given the unspecified nature of the particular activities that the Air District would fund through these strategies, there is no way to evaluate at this point whether there could potentially be any significant environmental impacts associated with them.

CEQA Guidelines Section 15145, as stated above, provides that "[i]f, after thorough investigation, a lead agency finds that a particular impact is too speculative for evaluation, the agency should note its conclusion and terminate discussion of the impact." That is also the case here with respect to evaluating impacts from some projects that the Air District may fund under the Community Action Plan. It is not possible at this stage to determine – beyond mere speculation – the nature, extent, location, or timing of any activities that may result from projects funded under the Plan and, therefore, it is not possible to evaluate whether any such activities may generate a significant impact. In such situations, CEQA does not contemplate an attempt to assess the significance of purely speculative impacts. Potential environmental impacts will be addressed as the Air District implements the Plan and it becomes clear what specific projects the District may support. When specific projects are proposed, they will be subjected to a CEQA environmental analysis before they can be implemented. At that point, the specific details about the project, including what types of activity will be required and what the potential environmental impacts could be, will be evaluated. The future CEQA analysis will be able to conduct a full analysis of any potential environmental impacts at that time, as the nature, extent, amount of funding, location, timing, and duration of the activity will be known. For these reasons, the impacts analysis in Chapter 2 does not evaluate potential impacts from any projects that the Air District may fund through its grants and incentives programs, where the impacts are speculative.

1.6.3 Technical Support, Educational Outreach and Advocacy

The third category of actions the Air District is proposing in the West Oakland Community Action Plan involves measures to promote sound policy development and healthy air quality choices throughout all sector of the economy and society. These activities include promoting best practices by public agencies and other entities through information resources, model ordinances, guidance documents, etc.; outreach and education to engage with community groups and other organizations; and advocacy in support of legislative and regulatory action at the federal and state levels in order to promote the District's air quality and public health goals.

The Air District's technical support, educational and advocacy efforts are aimed at supporting and encouraging other agencies, organizations, businesses and individuals as they take action to address air pollution and climate change concerns in areas outside of the Air District's direct regulatory authority. The District regularly participates with such entities to support them in developing plans, policies and programs that are aligned with the Air District's clean air goals. The Air District has partnered and participated in multiple collaborative policy and planning efforts, such as: (1) *Plan Bay Area* in conjunction with the Metropolitan Transportation Commission (MTC) and the Association of Bay Area Governments (ABAG); (2) CARB's *2016 Mobile Source Strategy*; (3) MTC's regional *Goods Movement Plan*; and (4) the *Bay Area Goods Movement Collaborative* convened by MTC and the Alameda County Transportation Commission.

Portions of the West Oakland Community Action Plan would continue and expand technical support, educational and advocacy efforts. For example, Strategy #38 continues the District's engagement in the environmental review process for development projects in West Oakland, providing data and technical assistance to lead agencies. The Air District provides this support through resources it has developed through its CEQA Guidelines document, and its *Planning Healthy Places* guidance document, among others. The Community Action Plan calls on the Air District to continue and enhance these efforts in West Oakland going forward.

The Air District also focuses advocacy efforts on supporting legislative and regulatory initiatives to promote clean air and climate protection. The West Oakland Community Action Plan includes actions for the Air District to seek authority to reduce emissions and risk from magnet sources such as the Port of Oakland, freight operations and warehouse distribution centers.

Finally, the Air District also engages in education and outreach efforts aimed at encouraging members of the public to generally make positive lifestyle choices to help improve air quality. For example, the Air District's existing "Spare the Air Every Day" Program encourages members of the public to reduce motor vehicle travel and other pollutant-emitting activities, especially on "Spare the Air" days when high ozone levels are predicted. The proposed West Oakland Community Action Plan incorporates education and outreach efforts through strategies that would provide education on measures that could reduce the use of energy and lead to more energy efficient buildings.

These technical support, education and advocacy efforts are not expected to result in any significant environmental impacts. Providing policy input by participating in the development of other agencies' plans and initiatives in those agencies' own regulatory areas, as the District has done with CARB's *Mobile Source Strategy* and MTC's *Goods Movement Plan*, does not involve any activities that could generate environmental impacts. Nor does providing technical support for implementing such plans and initiatives once they are adopted, for example identifying best practices to mitigate air quality impacts from infill development. And the same is true for other educational outreach and advocacy efforts the Air District will engage in under the proposed Plan, such as continuing to review and comment on CEQA documents, and providing educational programs to promote informed lifestyle choices related to clean air.

To the extent that the Air District's technical support, educational and advocacy efforts are aimed at promoting sound policy choices by other governmental agencies and private individuals, it is not possible to assess with any level of specificity how the District's efforts would result in specific actions by such third-parties that would result in physical changes to the environment. The Air District obviously hopes that its efforts will help influence positive outcomes. But it is not possible to predict beyond speculation what actions any other agency or private individual may take or not take as a result of the District's efforts, compared to what would occur absent any District action. As a result, it is not possible to assess whether there would be any physical changes to the environment that might occur as a result of the District's efforts under the Plan, let alone the extent of any potential adverse impacts associated with any such changes. Accordingly, under CEQA Guidelines Section 15145, such speculative impacts from the District's technical support, educational and advocacy efforts are not evaluated in Chapter 2.

1.6.4 Actions by Other Agencies

Finally, to be comprehensive, the West Oakland Community Action Plan also includes control strategies proposed to be implemented primarily or exclusively by other agencies, such as the City of Oakland and CARB. A large portion of the control strategies would be implemented by agencies other than the Air District.

The West Oakland Community Action Plan includes these control measures because they involve activities by other agencies in the region that further the same clean air goals for West Oakland that the Air District, and other agencies and organizations, are seeking to achieve under the Plan. Including them in the Plan serves to provide a comprehensive picture of all such activities throughout the region. These activities by other agencies are included for information purposes only, however. They are not dependent on approval of the control strategies that are under the authority of the Air District. Further, the Air District's approval of the control strategies will not authorize or commit those agencies to any action. As these actions and activities by independent agencies are not Air District actions and will occur independently of the District's approval of the control strategies under their authority, they are not direct or indirect effects resulting from approval of the Plan that must be analyzed in this document. Accordingly, Chapter 2 does not address implementation actions by other agencies that are independent of the Air District's implementation actions under the Community Action Plan.

ATTACHMENT A: DRAFT STRATEGIES

Action #	Section	Description	Authority
1	Land Use	The City of Oakland continues working with California Waste Solutions and CASS, Inc. to relocate operations to the former Oakland Army Base and works with the property owners and local residents to redevelop the former sites in West Oakland with new business and light industrial uses that fit into a green economy.	City of Oakland
2	Land Use	The Air District will continue to engage in environmental review processes for development projects in West Oakland, such as the Oakland A's Ballpark and the Macarthur Maze Vertical Clearance Project, including coordinating with community partners and lead agency staff, providing data and technical assistance, and reviewing and commenting on CEQA documents through 2025.	Air District
3	Land Use	The Air District will study the potential air pollution and health outcomes of allowing truck traffic on I-580 and designating a truck lane on I-880. Allowing truck traffic on I-580 would require legislative approval, re-engineering, and re-construction.	Air District
4	Land Use	Consistent with measures in the West Oakland Specific Plan, the City of Oakland identifies locations outside of West Oakland for heavier industrial businesses currently in West Oakland that contribute to air pollution emissions and negative health outcomes in West Oakland.	City of Oakland
5	Land Use	The City of Oakland amends existing City Ordinances and Administrative policies to accelerate relocation of auto- and truck-related businesses out of West Oakland that do not	City of Oakland

Action #	Section	Description	Authority
		conform with the zoning designations adopted in the West Oakland Specific Plan.	
6	Land Use	The City of Oakland uses incentives and subsidies to relocate auto- and truck-related businesses away from West Oakland that do not conform with the zoning designations adopted in the West Oakland Specific Plan. The Air District will provide emissions data and technical support to assist the City in these efforts.	City of Oakland
7	Land Use	The City of Oakland revises business licensing procedures to require current and proposed businesses to disclose truck visits per day and works with Caltrans to determine the number of trucks that park in the Caltrans right-of-way near West Oakland. These efforts would help to better understand emissions and exposure in West Oakland.	City of Oakland
8	Land Use	The City of Oakland amends existing City Ordinances and Administrative policies to list new truck yards as prohibited uses within West Oakland.	City of Oakland
9	Land Use	The City of Oakland develops a plan to limit the hours that trucks can operate in the community.	City of Oakland
10	Land Use	The City of Oakland creates a comprehensive area-wide urban canopy forest plan that identifies locations that trees can be added and maintained, such as parks and along Caltrans' rights-of-way, and develops a plan to protect existing trees that reduce exposure to air pollution emissions in West Oakland. This includes partnering with local nonprofit groups and encouraging trees on private property.	City of Oakland
11	Land Use	The City of Oakland works with local groups to train residents to maintain biofilters.	City of Oakland

Action #	Section	Description	Authority
12	Land Use	The Air District and the Environmental Indicators Project intends to implement the biofilter plan currently under development between Interstate 880 and the Prescott neighborhood in West Oakland by 2020.	Air District
13	Land Use	The City of Oakland adopts development impact fees that generate funds for various environmental mitigations, including green infrastructure.	City of Oakland
14	Land Use	The Air District provides subsidized loans for local businesses to install energy storage systems (e.g. batteries, fuel cells) to replace stationary sources of pollution (e.g. back-up generators).	Air District
15	Land Use	The City of Oakland reserves land for electrical charging stations for buses, trucks, and automobiles.	City of Oakland
16	Land Use	The City of Oakland requires solid barriers be incorporated into site design, similar to a sound wall, between buildings and sources of air pollution (for example, a freeway).	City of Oakland
17	Land Use	The City of Oakland adopts an ordinance that requires on-site renewable energy generation of at least 5% of a project's energy use.	City of Oakland
18	Land Use	The Air District advocates for more electrical infrastructure and power storage, development of (1) fast-charging facility, (1) truck charging stations and better land use support for electric trucks by 2025.	PG&E
19	Land Use	The Port of Oakland adopts an Electrical Infrastructure Plan for the maritime waterfront areas of Oakland. This Plan seeks to remove barriers to adoption of zero-emission trucks, such as cost, land, and ownership of charging equipment.	Port of Oakland

Action #	Section	Description	Authority
20	Land Use	The City of Oakland revises development requirements to require the implementation of as many transportation demand management (TDM) strategies as feasible by developers of new buildings.	City of Oakland
21	Land Use	The Air District works with the City and Port of Oakland and other agency and local partners to create a Sustainable Freight Advisory Committee to provide recommendations to each agency's governing board or council. The Committee's scope includes: air quality issues, enhanced/increased enforcement of truck parking and idling, improved referral and follow-up to nuisance and odor complaints related to goods movement, improvements to the Port appointment system, charging infrastructure and rates, developing land-use restrictions in industrial areas, and consideration of video surveillance to enforce truck parking, route, and idling restrictions.	Air District
22	Land Use	The City of Oakland adopts more stringent CEQA air quality construction and operations thresholds and mitigation requirements for West Oakland.	City of Oakland
23	Land Use	The City and Port of Oakland provides West Oakland community members public notice and at least 30 days of comment period on any relevant planning or land-use decisions not currently subject to such notice.	City of Oakland, Port of Oakland
24	Land Use	The Air District works with agency and local partners to improve referral and follow-up on nuisance and odor complaints by 2021. This work includes updates to complaint processes, enforcement procedures and	Air District

Action #	Section	Description	Authority
		coordination with other public agencies regarding odors and open burning complaints.	
25	Land Use	To address potential changes in local pollution exposure, the City of Oakland works with local community groups to address gentrification and the pricing out of long-term residents caused by gentrification. This effort includes meetings with local community groups and incentives and loans targeted to existing businesses and residents. Funding for this effort is identified as needed.	City of Oakland
26	Trucks	The California Air Resources Board develops improvements to the existing truck and bus inspection and maintenance programs. Potential improvements include increasing the warranty requirements, adding a lower in-use emissions performance level, increasing inspections in West Oakland, using aggregated GPS and other telecommunication records to identify locations of idling trucks and buses, and developing with the Air District a system using on-board diagnostic and remote sensing devices to identify and fix faulty emissions abatement devices on trucks and buses.	CARB
27	Trucks	The California Air Resources Board adopts regulatory amendments to increase the number of zero emission trucks and buses operating in West Oakland.	CARB
28	Trucks	The California Air Resources Board adopts regulatory amendments requiring trucks and buses with "Clean Idle" stickers to idle no more than 5 minutes when in West Oakland.	CARB
29	Trucks	The City of Oakland requires all loading docks in warehouse facilities located within West Oakland and adjacent waterfront	City of Oakland

Action #	Section	Description	Authority
		area provide electrical connections for electric trucks and transportation refrigeration units. As part of the consideration of this measure, the City of Oakland conducts a study to identify small truck yards and other locations where transportation refrigeration units operate extensively.	
30	Trucks	The Port of Oakland, as part of the 2020 and Beyond Seaport Air Quality Plan, supports the transition to zero-emission drayage truck operations, including setting interim year targets out to 2035, coordinating an extensive zero-emission truck commercialization effort, working with the City of Oakland to amend local ordinances to increase the allowable weight limits for single-axle, zero-emission trucks on local streets located within the Port and the Oakland Army Base/Gateway areas and developing an investment plan for needed upgrades to the Port's electrical infrastructure. The Port of Oakland also works with the California Public Utilities Commission and the California Energy Commission to study the development of time-of-day electric rate structures favorable to truck operators.	Port of Oakland
31	Trucks	The City of Oakland, consistent with the West Oakland Truck Management Plan: 1) improves training for police officers and community resource officers who issue truck and trailer parking tickets; 2) changes the parking regulations so they are easier to enforce; 3) increases truck parking fines; 4) targets enforcement at specific times and locations; 5) offers incentives to truck drivers and businesses to	City of Oakland

Action #	Section	Description	Authority
		park at the waterfront; and 6) improves signage directing drivers to available truck parking.	
32	Trucks	The City of Oakland, consistent with the West Oakland Truck Management Plan: 1) improves signage regarding existing truck routes; 2) studies the location and movement of smaller truck fleets operating in West Oakland; and 3) adds to or changes truck routes, time of day restrictions and prohibited streets.	City of Oakland
33	Trucks	The City of Oakland, consistent with the West Oakland Truck Management Plan, implements, in consultation with West Oakland residents, traffic calming measures to keep truck traffic of residential streets.	City of Oakland
34	Trucks	The Air District works with CARB to streamline the process for providing financial incentives for fueling infrastructure, and for low and zero-emission equipment. The Air District increases outreach and assistance to individual owner-operators and small companies by providing 2 workshops in West Oakland by 2022.	Air District
35	Trucks	The City and Port of Oakland award long-term leases to vendors that will deliver trucker services (including mini-market and convenience stores, fast food and fast casual restaurants) and parking to keep trucks off West Oakland streets.	City of Oakland, Port of Oakland
36	Trucks	The Port of Oakland studies the effects on truck flow and congestion due to increasing visits from larger container ships, the feasibility of an off-terminal container yard that utilizes zero emission trucks to move containers to and from the marine terminals, and the potential efficiency gains from increasing the number of trucks	Port of Oakland

Action #	Section	Description	Authority
		hauling loaded containers on each leg of a roundtrip to the Port.	
37	Trucks	The Alameda County Transportation Commission works with West Oakland residents and businesses to develop mitigations to short- and long-term impacts caused by the construction of the 7th St Grade Separation East Project and the implementation of other elements of the GoPort Initiative.	ACTC
38	Other Mobile Sources	The City of Oakland collaborates with AC Transit, BART, Emery-Go-Round and the local community to implement the broad array of transit improvements identified in the West Oakland Specific Plan.	Multiple
39	Other Mobile Sources	The City of Oakland collaborates with MTC and ACTC to consider a program for extending car sharing to low-income individuals and groups in West Oakland.	City of Oakland, others
40	Other Mobile Sources	AC Transit implements the Grand Avenue transit improvements identified in its Bus Rapid Transit Plan, as well as mitigations if the improvements cause increases in truck and auto idling on Grand Avenue.	AC Transit
41	Other Mobile Sources	The Air District plans to offer up to $7 million per year to replace older autos through the Vehicle Buy Back program, and up to $4 million per year through the Clean Cars for All programs to replace older autos and provide an incentive for a hybrid electric, plug-in hybrid electric, battery electric vehicle, or to get a Clipper Card for public transit.	Air District
42	Other Mobile Sources	The Air District offers financial incentives to replace box and yard diesel trucks with zero emission trucks owned by West Oakland businesses every year.	Air District
43	Other Mobile Sources	The Air District plans to offer financial incentives to upgrade tugs and barges operating at the	Air District

Action #	Section	Description	Authority
		Port of Oakland with cleaner engines every year.	
44	Other Mobile Sources	The Air District plans to offer financial incentives to upgrade line-haul, passenger, and switcher (yard) locomotives with cleaner engines every year.	Air District
45	Other Mobile Sources	The Air District plans to offer financial incentives to support the development of a hydrogen refueling station and the purchase of trucks and off-road equipment powered by fuel cells every year.	Air District
46	Other Mobile Sources	The Air District offers financial incentives to replace long-haul diesel trucks with zero emission trucks owned by West Oakland businesses every year.	Air District
47	Other Mobile Sources	The Air District will award up to $1 million in funding incentives to pay for the cost of purchasing cleaner equipment in West Oakland potentially including: electric lawn and garden equipment, battery electric Transportation Refrigeration Units, cargo-handing equipment by 2021.	Air District
48	Other Mobile Sources	The Bay Area Rapid Transit District to develop a bike station with controlled access at the West Oakland BART Station.	City of Oakland
49	Other Mobile Sources	The City of Oakland implements the broad array of bicycle and pedestrian improvements identified in the West Oakland Specific Plan.	City of Oakland
50	Other Mobile Sources	Through the Pilot Trip Reduction Program, the Air District offers incentives for the purchase of electric bicycles for bike share programs.	Air District
51	Other Mobile Sources	The Oakland Unified School District and the City of Oakland, as part of the Safe Routes to Schools Program in West Oakland, begin twice a day street closures next to public schools in West Oakland to keep cars and	Oakland Unified School District, City of Oakland

Action #	Section	Description	Authority
		trucks away from arriving and departing students.	
52	Other Mobile Sources	The City of Oakland increases the frequency of street sweeping in West Oakland to decrease road dust, beginning with streets adjacent to schools and designated truck routes. The California Department of Transportation increases the frequency of street sweeping along the I-880, I-980 and I-580 freeways. Consideration is given to technology and techniques that avoid re-suspending road dust.	City of Oakland
53	Other Mobile Sources	The California Air Resources Board modifies the At-Berth Air Toxics Control Measure such that beginning in 2021 100% of all container vessels control emissions while at berth at the Port of Oakland.	CARB
54	Other Mobile Sources	The California Air Resources Board amends the Harbor Craft Air Toxics Control Measure to achieve additional control of harbor craft emissions and require early compliance by Harbor Craft operating near West Oakland.	CARB
55	Other Mobile Sources	The California Air Resources Board adopts regulations to reduce idling emissions from all rail yard sources, with an emphasis on reducing emissions from locomotives not pre-empted under the federal Clean Air Act, and early compliance for equipment and locomotives operating in West Oakland.	CARB
56	Other Mobile Sources	The Port of Oakland implements a Clean Ship Program to increase the frequency of visits by ships with International Maritime Organization Tier 2 and Tier 3 engines.	Port of Oakland
57	Other Mobile Sources	The Port of Oakland implements a Clean Locomotive Program to increase the increase the number	Port of Oakland

Action #	Section	Description	Authority
		of US EPA Tier 4 compliant locomotives used by the UP, BNSF and OGRE railways to provide service in and out of the Port of Oakland;	
58	Other Mobile Sources	The Port of Oakland studies the feasibility of using electric switcher locomotives at the two Port railyards.	Port of Oakland
59	Other Mobile Sources	The Air District works with Schnizter Steel to study the feasibility of installing a shore-power or "bonnet" system to capture and abate vessel emissions at the West Oakland facility by 2021.	Air District
60	Stationary Sources	The Air District intends to seek authority in 2021 to reduce emissions and risk from magnet sources, such as the Port of Oakland, freight operations and warehouse distribution centers.	Air District
61	Stationary Sources	The Air District proposes amendments to existing regulations to further reduce emissions from metal recycling and foundry operations, such as changes to 1) Regulation 6, Rule 4: Metal Recycling and Shredding Operations, which requires metal recycling and shredding facilities to minimize fugitive PM emissions through the development and implementation of facility Emission Minimization Plans; and 2) Regulation 12, Rule 13: Foundry and Forging Operations, which requires metal foundries and forges to minimize fugitive emissions of PM and odorous substances through the development and implementation of facility Emission Minimization Plans by 2025.	Air District
62	Stationary Sources	Regulation 11, Rule 18: Reduce Risk from TACS at Existing Facilities (Reg. 11-18) requires selected Bay Area facilities to reduce risk or install best	Air District

Action #	Section	Description	Authority
		available retrofit control technology for toxics on all significant sources of toxic emissions. Based on the results of the Technical Assessment, the Air District may require Schnitzer Steel to adopt a Risk Reduction Plan to meet these requirements during Phase 1 of Reg. 11-18 implementation, and may require East Bay Municipal Utility District Wastewater Treatment Plant to adopt a Risk Reduction Plan to meet these requirements during Phase 2 of Reg 11-18 implementation.	
63	Stationary Sources	The Air District intends to provide incentives to replace existing diesel stationary and standby engines (fire pumps, dryers, conveyor belts, cranes) with Tier 4 diesel or cleaner engines. Priority is given to upgrading Tier 0, 1 & 2 engines located closest to schools, senior citizen centers, child care facilities, and hospitals.	Air District
64	Stationary Sources	The Air District proposes new regulations to reduce emission sources from autobody and other coating operations, including the use of vanishing oils and rust inhibitors by 2025.	Air District
65	Stationary Sources	The Air District works with California Air Resources Board and other agency and community partners to identify incentives to improve the shortcut nitrogen removal processes at waste water treatment plants to reduce emissions by 2025. Shortcut nitrogen removal processes provide significant potential benefits in terms of energy, carbon, and chemical savings compared to conventional biological nitrogen removal.	Air District
66	Stationary Sources	The Air District proposes new regulations to reduce emissions from waste water treatment plants and anaerobic digestion	Air District

Action #	Section	Description	Authority
		facilities, such as a regulation to reduce emissions of methane, reactive organic gases and oxides of nitrogen by 2019.	
67	Stationary Sources	The Air District proposes a regulation to reduce emissions of reactive organic gases and other toxic compounds from organic liquid storage tanks by 2020.	Air District
68	Stationary Sources	The Air District advocates for a plan that East Bay Clean Energy and PG&E are spearheading to replace the Dynergy Power Plant with a cleaner and more reliable source of energy by 2022. The proposed location for this initiative is the Oakland C, Oakland L, Maritime Port of Oakland, and Schnitzer Steel substation pocket, which is located within PG&E's Oakland distribution planning area. Eligible resource types include: (1) in-front-of-the-meter renewable generation; (2) in-front-of-the-meter energy storage, and (3) behind-the-meter energy storage. EBCE is seeking to procure the energy, resource adequacy (RA), and renewable energy credits (RECs) associated with these local resources, while PG&E will focus on meeting Oakland's transmission reliability needs.	East Bay Clean Energy, PG&E
69	Health Programs	The Air District intends to develop and fund a program to reduce exposure to air pollution at schools, day care facilities, hospitals, apartments and homes in West Oakland by 2021. This strategy includes policies or grants for building energy efficiency upgrades to reduce infiltration of pollutants and the installation of high-efficiency air filtration systems (rated MERV 13 or higher).	Air District
70	Health Programs	The City of Oakland works with local and agency partners to implement regional and local	City of Oakland

Action #	Section	Description	Authority
		adoption of the State Department of Public Health's Health In All Policies program.	
71	Health Programs	Consistent with the Oakland Healthy Development Guidelines, the City of Oakland implements a project-wide smoking ban in Oakland at new developments.	City of Oakland
72	Health Programs	Consistent with the State's Building Energy Efficiency Standards for air filtration in effect as of January 1, 2019, the City of Oakland requires newly constructed buildings of 4 or more units to include air filtration systems equal to or greater than MERV 13 (ASHRAE Standard 52.2), or a particle size efficiency rating equal to or greater than 50 percent in the 0.30-1.0 µm range and equal to or greater than 85 percent in the 1.0-3.0 µm range (AHRI Standard 680).	City of Oakland
73	Health Programs	The City of Oakland works with agency and community partners to undertake participatory budgeting with West Oakland community members to allocate local health improvement grants that reduce emissions or exposure to emissions.	City of Oakland
74	Health Programs	The Air District researches actions that are potentially exposure-reducing, such as 1) An engineering evaluation of exhaust stacks and/or vents to determine if relocation will reduce local exposure; 2) A study to determine if smart air filtration systems can reduce exposure by in-taking air during daily non-peak vehicle travel times, such as between midnight and four a.m.; 3) A study of the potential air quality benefits of a centralized package delivery site such as personal lockers by 2025.	Air District
75	Health Programs	The City of Oakland works with local businesses, partner agencies, and community	City of Oakland

Action #	Section	Description	Authority
		members to develop a Green Business Strategic Plan to attract, retain, and support innovative green companies in West Oakland. This effort includes coordination with State and local agencies to develop a criteria for green business certification for new and existing businesses.	
76	Health Programs	The California Air Resources Board sets a limit on West Oakland's cumulative exposure to TACs.	CARB
77	Health Programs	The City of Oakland works with community partners to align West Oakland zoning with the Healthy Development Guidelines and apply the Guidelines to new building projects.	City of Oakland
78	Health Programs	Expansion of the Alameda County Public Health Asthma Management programs.	Alameda County Public Health Department
79	Health Programs	The City of Oakland works with Alameda County Public Health to improve access to medical services within West Oakland. This work expands existing programs such as the 1) Child Health and Disability Prevention Program free health check-ups for infants through teens; 2) Asthma Management at schools; 3) Building Blocks for Health Equity which works to correct inequity in health outcomes for children; 4) Urban Male Health Initiative which is charged with reducing the premature mortality of men and boys in Alameda County; and 5) the Alameda County Health Improvement Plan to develop and implement a five-year county plan to improve health and achieve health equity.	City of Oakland
80	Health Programs	The Alameda County Health Department works with agency and local partners to investigate the use of green building approaches in housing construction and renovation that	Alameda County Public Health Department

Action #	Section	Description	Authority
		will reduce emissions and exposure to air pollution emissions. This work examines weatherization/energy efficiency (EE) and renewable energy services. This work draws from the Contra Costa County Health Department's pilot effort in cooperation with the Regional Asthma Management Program.	

CHAPTER 2

ENVIRONMENTAL CHECKLIST FORM

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:	West Oakland AB 617 Community Action Plan
Lead Agency Name:	Bay Area Air Quality Management District
Lead Agency Address:	375 Beale Street, Suite 600 San Francisco, California 94105
Contact Person:	Ada E. Márquez
Contact Phone Number:	415-749-8673
Project Location:	West Oakland
Project Sponsor's Name:	Bay Area Air Quality Management District
Project Sponsor's Address:	375 Beale Street, Suite 600 San Francisco, California 94105
General Plan Designation:	The City of Oakland’s General Plan designations within the West Oakland Plan include Mixed Housing Type Residential, Urban Residential, Community Commercial, Institutional, Housing and Business Mix, Business Mix, Urban Park and Open Space, Gen Industrial/Transportation, Resource Conservation Area, and Regional Commercial. The proposed project is also within the West Oakland Planning Specific Plan.
Zoning:	The City of Oakland’s Zoning Plan designation include Residential, Open Space, Central Business, Commercial, Industrial, and Special and Combining Zoning.
Description of Project:	See Chapter 1 for the Project Description
Surrounding Land Uses and Setting:	The San Francisco Bay, The Oakland-San Francisco Bay Bridge, The Port of Oakland, Interstate Highways80, 580, 880, and 980, and The Central Estuary District.
Other Public Agencies Whose Approval is Required:	California Air Resources Board

Have California Native American tribes traditionally and culturally affiliated with the project area requested consultation pursuant to Public Resources Code section 21080.3.1? If so, is there a plan for consultation that includes, for example, the determination of significance of impacts to tribal cultural resources, procedures for confidentiality, etc.?	No tribes have requested formal consultation under California Public Resources Code (PRC) §21080.3.1.

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.

☐	Aesthetics	☐	Agriculture and Forestry Resources	☑	Air Quality
☑	Biological Resources	☐	Cultural Resources	☑	Energy
☐	Geology & Soils	☑	Greenhouse Gas Emissions	☑	Hazards & Hazardous Materials
☐	Hydrology & Water Quality	☐	Land Use & Planning	☐	Mineral Resources
☐	Noise	☐	Population & Housing	☐	Public Services
☐	Recreation	☐	Transportation	☐	Tribal Cultural Resources
☑	Utilities & Services Systems	☐	Wildfire	☑	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.

Ada E. Márquez May 13, 2019

Signature: Date:

Ada E. Márquez

May 13, 2019

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 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 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

	Potentially Significant Impact	Less Than Significant Impact With Mitigation Incorporated	Less-than-Significant Impact	No Impact
I. AESTHETICS. Except as provided in Public Resources Code §21099, would the project:				
a) Have a substantial adverse effect on a scenic vista?	☐	☐	☐	☑
b) Substantially damage to scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings along a scenic highway?	☐	☐	☐	☑
c) In non-urbanized areas, substantially degrade the existing visual character or quality of public views of the site and its surroundings? (Public views are those that are experienced from a publicly accessible vantage point). If the project is in an urbanized area, would the project conflict with applicable zoning and other regulations governing scenic quality.	☐	☐	☑	☐
d) Create a new source of substantial light or glare that would adversely affect daytime or nighttime views in the area?	☐	☐	☑	☐

Environmental Setting

West Oakland has a distinct visual character influenced by the new eastern segment of the Bay Bridge; the world's widest bridge; West Oakland's historic residential neighborhoods; the Port of Oakland, America's 5th largest port; other heavy industrial areas; and a major regional transportation hub including the MacArthur Maze. Both the former Oakland Army Base and the Port of Oakland are located, respectively in the west and south areas of the West Oakland community. West Oakland is also characterized by a significant amount of vacant and underutilized land distributed throughout the area. The visual character of large parts of West Oakland has been affected by social and economic conditions, including the decline in manufacturing and resulting vacant buildings; the loss of retail trade to the suburbs and resulting empty storefronts and underutilized commercial land; and urban problems such as blight and graffiti.

Major transportation corridors are located within or adjacent to West Oakland including Interstates 80, 880, 580, and 980. Interstates 580, 880, and 980 form the edges of the West Oakland community. The City of Oakland General Plan identified Interstates 580 and 880 entrances to the city as major gateways. Local transportation corridors located within West Oakland include West Grand Avenue, 7th Street, Mandela Parkway, San Pablo Avenue, Peralta Street, Martin Luther King Jr. Way, Market Street and Adeline Street. Segments of these corridors lack streetscape improvements that create a safe pedestrian environment, or safely balance multiple modes of travel, including public transit and bicycles.

The realignment of Interstate 880, the most expensive freeway construction project per mile in the world at the time, followed the 1989 Loma Prieta earthquake, and resultant collapse in West Oakland of I-880's Cypress Structure, where the upper deck onto the lower deck killing 42 people, most of the people who died in that earthquake.[1] That tragedy led to the creation of Mandela Parkway, a landscaped, treelined parkway that extends 18 blocks, from 8th Street to 32nd Street. The City has proposed and undertaken streetscape improvements projects for some of these streets including 7th Street, Martin Luther King Jr. Way, and Peralta Street.

The City of Oakland General Plan identifies the West Oakland BART Station as a visual landmark. Other readily identifiable structures in West Oakland include the elevated BART tracks, 16th Street Station, the U.S. Postal Service mail distribution center and garage, Jack London Gateway Center, and the California Hotel (City of Oakland, 2014).

Regulatory Background

Visual resources are generally protected by the City and/or County General Plans through land use and zoning requirements. The City of Oakland has a Scenic Highways Element which does not specifically apply to the West Oakland District. However, other goals and policies from the City of Oakland's General Plan may apply within the West Oakland community.

Significance Criteria

Project-related impacts on aesthetics and visual resources will be considered significant if any of the following conditions are met:

- The proposed project would have a substantial adverse effect on a scenic vista.
- The proposed project would substantially damage scenic resources, including but not limited to trees, rock outcropping, and historical buildings within a state scenic highway.

[1] For a discussion of the 1989 earthquake that collapsed the Interstate 880's Cypress Street Viaduct in West Oakland, see https://en.wikipedia.org/wiki/Cypress_Street_Viaduct .

- The proposed project would substantially degrade the existing visual character or quality of the site and its surrounds.
- The proposed project would add a visual element of urban character to an existing rural or open space area or add a modern element to a historic area.
- The proposed project would create a new source of substantial light or glare, which would adversely affect day or nighttime views in the area.

Discussion of Impacts

1. a) No Impact. West Oakland has scenic vistas of the San Francisco Bay as well as the new and old segments of the Willie L. Brown, Jr. Oakland-San Francisco Bay Bridge, whose Eastern terminus lands in West Oakland. A scenic vista is a location that offers a high quality and visually interesting view. There are no officially designated scenic vistas within the West Oakland area. The City of Oakland General Plan's Open Space, Conservation and Recreation Element calls for protection of views, particularly views of the East Bay hills from the flatlands; views of Downtown Oakland and Lake Merritt; views of the shoreline; and panoramic views from Skyline boulevard/Grizzly Peak Road, and other hillside locations.

While scenic vistas from the West Oakland community are limited by flat terrain and existing development, as compared to other parts of the City, the Oakland hills provide a prominent visual feature in the community. Portions of the East Bay hills are visible from various public vantage points within West Oakland. Some public vantage points have views of taller buildings in downtown and the cranes at the Port of Oakland. The East Bay hills have views over the community to San Francisco Bay. No designated scenic vistas in the West Oakland Community Action Plan would result in any potential significant impacts.

1. b) No **Impact**. Two highways within Alameda County have been designated as scenic highways. Interstate 580 has been designated as a scenic highway from the San Joaquin County line to State Route 205, which is over 40 miles from West Oakland. The MacArthur Freeway is a designated scenic highway from San Leandro City limit to State Route 24 in Oakland, which is over 13 miles from West Oakland. Interstate 680 is designated as a scenic highway from Mission Boulevard in Fremont to the Contra Costa County line, which is about 20 miles from West Oakland away at its closest point. Thus, any physical changes in the West Oakland area that occur as a result of the proposed project would not be visible from any scenic highways due to distance separation and intervening topography (e.g., hills). The Plan will not have a potentially significant impact on unique rock outcrops or plant life that could be considered a visual resource. Thus, modifications that occur as a result of the proposed project are not expected to damage or degrade existing scenic resources.

1. c) Less **than Significant.** Physical modifications at facilities associated with implementation of control strategies in the Community Action Plan would be limited to existing facilities, and primarily industrial facilities. For example, any additional equipment or measures would be constructed/implemented within the confines of the existing industrial facilities and adjacent to existing industrial structures. The implementation of a bonnet system to control ship emissions would require that the bonnet be placed on the stack of the ship making it visible to the areas within and surrounding the port. The port facilities are located in industrial areas which do not have scenic views or scenic resources and it would be separated from the residential areas of West Oakland by Interstate 880. Other strategies would encourage the use of alternative fuels and zero emissions mobile sources (trucks, buses, locomotives), and provide shore power on use of a bonnet system for ships. Additionally, new air pollution control equipment is not expected to block any scenic vista, degrade the visual character or quality of the area, or result in significant adverse aesthetic impacts. Thus, residential areas and the surrounding community will have less than significant adverse aesthetic impacts.

1. d) Less **than Significant**. The businesses within the Community Action Plan may need to install equipment to reduce criteria pollutant emissions from their facilities. West Oakland does have facilities that currently operate and have existing lighting for nighttime operations. For example, port facilities can operate continuously 24 hours per day, 7 days per week and are already lighted for nighttime operations. Similarly, most other types of industrial operations have continuous lighting. Therefore, implementation of the Community Action Plan strategies is not expected to require any additional lighting to be installed as a result of the installation of new or modified equipment. New light sources, if any, would be located in industrial areas and 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, implementation of the Community Action Plan is not expected to have significant adverse aesthetic impacts to the surrounding community.

Conclusion

Based upon the above evaluation from the City of Oakland’s General Plan and West Oakland Specific Plan, significant adverse impacts to aesthetics or light and glare are not expected to occur due to the proposed project; therefore, they will not be further evaluated in the Draft EIR.

	Potentially Significant Impact	Less Than Significant Impact With Mitigation Incorporated	Less Than Significant Impact	No Impact
II. AGRICULTURE and FOREST 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:				
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?	☐	☐	☐	☑
b) Conflict with existing zoning for agricultural use or conflict with a Williamson Act contract?	☐	☐	☐	☑
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))?	☐	☐	☐	☑
d) Result in the loss of forest land or conversion of forest land to non-forest use?	☐	☐	☐	☑
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?	☐	☐	☐	☑

Environmental Setting

The West Oakland community is a developed urban area with multiple zoning designations such as, residential, open space, business, commercial, and industrial. Approximately 59 percent of the land use is residential, 23 percent is utilized as industrial, commercial and auto-related/parking uses, while government/institutional and utilities uses occupy the remaining 18 percent of the land (City of Oakland, 2014). Farmland land or forest resources are not located within the West Oakland community.

Regulatory Background

Farmland and forestland resources are generally protected by the California Resource Agency, the City and/or County General Plans through land use and zoning requirements.

Significance Criteria

Project-related impacts on agriculture and forest resources will be considered significant if any of the following conditions are met:

- The proposed project conflicts with existing zoning or agricultural use or Williamson Act contracts.
- The proposed project will convert prime farmland, unique farmland or farmland of statewide importance as shown on the maps prepared pursuant to the farmland mapping and monitoring program of the California Resources Agency, to non-agricultural use.
- The proposed project conflicts with existing zoning for, or causes rezoning of, forest land (as defined in Public Resources Code §12220(g)), timberland (as defined in Public Resources Code §4526), or timberland zoned Timberland Production (as defined by Government Code § 51104 (g)).
- The proposed project would involve 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.

Discussion of Impacts

1. a and b) No Impact. Land designated by the California Resources Agency as Prime Farmland, Unique Farmland or Farmland of Statewide Importance are considered Farmland for CEQA purposes. The West Oakland community is an urbanized area and no designated Farmlands are within the community. The community and surrounding areas are designated as Urban and Built-Up Land by the California Department of Conservation. Furthermore, the area is not zoned for agricultural and no Williamson Act contracts are located within the West Oakland area.[2] Therefore, the project would not conflict with existing zoning for agricultural use or with Williamson Act contracts.

1. c and d) No **Impact.** The West Oakland community is an urbanized area with no forest land or timberland resources in the community. Therefore, the proposed project would not conflict with existing zoning for, or cause re-zoning of forest land, and would not result in the loss of forest land or conversion of forest land to non-forest use or impact timberland zoned as Timberland Production.

1. e) No Impact. Implementation of the Community Action Plan's strategies would not involve 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; since, agricultural and forest land resources are not located within the West Oakland community.

Conclusion

Based upon the above considerations, the proposed project will not have significant adverse impacts to agricultural and forest resources are not expected to occur due to the proposed project. Therefore, agriculture and forest resources will not be further evaluated in the Draft EIR.

[2] California Department of Conservation, Division of Land Resource Protection, Contra Costa County Williamson Act FY 2012/2013, available atftp://ftp.consrv.ca.gov/pub/dlrp/wa/

	Potentially Significant Impact	Less Than Significant Impact With Mitigation Incorporated	Less Than Significant Impact	No Impact
III. AIR QUALITY.				
When 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:				
a) Conflict with or obstruct implementation of the applicable air quality plan?	☐	☐	☐	☑
b) Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is a non-attainment area for an applicable federal or state ambient air quality standard?	☑	☐	☐	☐
c) Expose sensitive receptors to substantial pollutant concentrations?	☑	☐	☐	☐
d) Result in other emissions (such as those leading to odors adversely affecting substantial number of people?)	☐	☐	☑	☐

Environmental Setting

The Air District is responsible to ensure that state and federal ambient air quality standards are achieved and maintained in its geographical jurisdiction, the San Francisco Bay Area The San Francisco Bay Area Air Basin (Bay Area) counties include all of Alameda, Contra Costa, Marin, Napa, San Francisco, San Mateo, Santa Clara, and the southern portion of Sonoma, and the southwestern portion of Solano County. 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), sulfur dioxide (SO_2), particulate matter less than 10 microns in diameter (PM_{10}), particulate matter less than 2.5 microns in diameter ($PM_{2.5}$), and lead.

The Bay Area is characterized by complex terrain, consisting of coastal mountain ranges, inland valleys, and bays, which affect normal wind flow patterns. The Coast Range splits resulting in a western coast gap, Golden Gate, and an eastern coast gap, Carquinez Strait, which allow air to flow in and out of the Bay Area and the Central Valley.

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.

Air quality conditions in the San Francisco Bay Area have improved greatly since the Air District was created in 1955, and regional concentrations of criteria pollutants are now in compliance with or near compliance with most ambient air quality standards. However, the Bay Area is not fully in attainment for the National and State 8-hour ozone standards and the State one-hour ozone standard. Although monitoring data shows that the Bay Area meets national and state standards for $PM_{2.5}$, the Bay Area is still formally designated as non-attainment for several $PM_{2.5}$ standards. For the national standards, the non-attainment designation will continue to apply until the Air District submits, and the U.S. EPA approves a resignation request and a maintenance plan which is discussed in the Clean Air Plan (2017). NOx and other pollutants react to produce secondary $PM_{2.5}$ in the form of nitrates. NOx reductions will have the added benefit of reducing secondary $PM_{2.5}$ formation.

Regulatory Background

Criteria Pollutants

At the federal level, the Clean Air Act Amendments of 1990 give the U.S. Environmental Protection Agency 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 Bay Area Air Quality Management 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.

The Air 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 Air District 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.

Assembly Bill (AB) 617 (C. Garcia, Chapter 136, Statutes of 2017) requires the adoption and implementation of community emissions reduction plans for targeted jurisdictions with disproportionate impacts from air pollution. Pursuant to AB 617, the Air District and the West Oakland Environmental Indicators Project jointly developed a community emissions reduction plan, referred to as the Community Action Plan, for West Oakland. The proposed plan includes strategies at the community level to maximize emission reductions and reduce residents' cumulative exposure to criteria air pollutants and toxic air contaminants. The West Oakland Community Action Plan is an integrated multi-pollutant community air quality plan to eliminate health risk disparities in West Oakland. This Community Action Plan also documents the Steering Committee's effort to study air pollution in West Oakland, and to identify and to prioritize Action Strategies that once implemented, will significantly reduce West Oakland's air pollution burden.

Toxic Air Contaminants (TAC)

The Air District regulates Toxic Air Contaminants (TACs) through federal, state, and local programs. At the federal level, TACs are regulated primarily under the authority of the Clean Air Act. Prior to the amendment of the Clean Air Act in 1990, source-specific National Emission Standards for Hazardous Air Pollutants (NESHAPs) were promulgated under Section 112 of the Clean Air Act for certain sources of radionuclides and Hazardous Air Pollutants.

Title III of the 1990 Clean Air Act amendments requires U.S. Environmental Protection Agency to promulgate NESHAPs on a specified schedule for certain categories of sources identified by U.S. Environmental Protection Agency as emitting one or more of the 189 listed Hazardous Air Pollutants. 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 Clean Air Act Section 112 requirements in a timely manner.

Many of the sources of TACs that have been identified under the Clean Air Act are also subject to the California TAC regulatory programs. CARB developed regulatory programs for the control of TACs, including: (1) California's TAC identification and control program, adopted in 1983 as Assembly Bill 1807 (AB 1807 (Tanner 1983)) (California Health and Safety Code §39662), a two-step program in which substances are identified as TACs, and airborne toxic control measures are adopted to control emissions from specific sources; and (2) The Air Toxics "Hot Spots" Information and Assessment Act of 1987 (AB 2588 (Connelly 1987)) (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.

In 2004, the Air District initiated the Community Air Risk Evaluation (CARE) program to identify population areas with relatively high concentrations of air pollution and most vulnerable to health impacts, which include toxic air contaminants (TACs) and fine particulate matter (PM). Maps of communities most impacted by air pollution, generated through the CARE program, have been integrated into many Air District programs. For example, the Air District 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, assist model ordinances, new regulations for stationary sources and indirect sources, and advocacy for additional legislation.

Significance Criteria

The most recently available Air District draft CEQA guidelines established criteria pollutant thresholds for specific projects, general plans, and regional plans. The Air District's draft CEQA Guidelines (BAAQMD, 2017a) established criteria pollutant thresholds for air quality plans of "no net increase in emissions," which is appropriate for air quality plans because they include a mix of control measures with individual trade-offs. For example, one control measure may result in combustion to reduce reactive organic emissions, while increasing criteria pollutant emissions associated with combustion by a small amount. Those small increases in combustion emissions would be offset by decreases from other measures focused on reducing criteria pollutants. Because the proposed project is a Community Action Plan with the goal of reducing emissions, the criteria pollutant threshold for air quality plans of "no net increase in emissions" will apply to the proposed project.

Discussion of Impacts

3. a) No Impact. The proposed Community Action Plan would not conflict with or obstruct implementation of the applicable air quality plan. The applicable air quality plan is the Air District's recently-adopted 2017 Clean Air Plan, *Spare the Air, Cool the Climate*. The Plan outlines a strategy for achieving the Bay Area's clean air goals by reducing emissions of ozone precursors, particulate matter, and other pollutants in the region. The Community Action Plan will not conflict with or obstruct implementation of the 2017 Clean Air Plan, rather it will help achieve the Plan's goals by helping to reduce diesel particulate matter (Diesel PM), fine particulate matter ($PM_{2.5}$), criteria pollutants, and TACs emissions in West Oakland, including emissions of ozone precursors (ROG and NOx) and particulate matter or precursors to particulates (NOx and SO_2); thus, improving public health and air quality in the region.

3. b) and c) Potentially **Significant Impact.** The primary purpose of developing the West Oakland Community Action Plan is to identify emission control strategies to reduce toxic air contaminants and criteria air pollutants primarily from sources within the community. However, some types of control strategies in the Community Action Plan could have the potential to increase emissions of one or more air pollutants while reducing the emissions of other air pollutant(s). These secondary or indirect air quality impacts could result from construction activities associated with the installation of air pollution control equipment (e.g., bonnet systems on ships), or the control equipment itself.

Some of the emission control strategies could include financial incentives to replace existing diesel stationary and standby engines with Tier 4 diesel or cleaner engines, to replace older automobiles, and provide grants for building energy efficiency upgrades. Other strategies would encourage the use of alternative fuels and zero emissions mobile sources (trucks, buses, locomotives). Short-term and/or indirect impacts could potentially have cumulatively net increase of criteria pollutants and potentially temporarily expose sensitive receptors. The Draft EIR will evaluate the air quality impacts and disclose the benefits associated with the Community Action Plan.

3. d) Less Than Significant. No emissions are expected during either the construction or operational phases that are expected to generate odors. No significant odor impacts are expected to occur with the proposed project.

Conclusion

Implementation of the Community Action Plan will reduce criteria pollutants and toxic air contaminants (TACs) emissions and reduce exposure to sensitive receptors from the facilities in West Oakland. The construction and operation of new air pollution control systems have the potential to increase emissions of other criteria pollutants and generate localized impacts. However, no significant impacts were identified on air quality plans or the generation of odors.
Therefore, potential adverse secondary air quality impacts from implementing certain control strategies will be evaluated in the Draft EIR.

	Potentially Significant Impact	Less Than Significant Impact With Mitigation Incorporated	Less Than Significant Impact	No Impact
IV. BIOLOGICAL RESOURCES. Would the project:				
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 Game or U.S. Fish and Wildlife Service?	☐	☑		☐
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 Game or U.S. Fish and Wildlife Service?	☐	☐	☐	☑
c) Have a substantial adverse effect on state or federally protected wetlands (including, but not limited to, marsh, vernal pool, coastal wetlands, etc.) through direct removal, filling, hydrological interruption, or other means?	☐	☐	☐	☑
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?	☐	☑		☐
e) Conflicting with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?	☐	☑		☐
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?	☐	☐	☐	☑

Environmental Setting

Fronting San Francisco Bay on the West, the West Oakland community is urbanized with some open space, residences, businesses, and a variety of industries. The West Oakland Community Action Plan does include the Port of Oakland, which is bounded by the San Francisco Bay. According to the California Natural Diversity Database (CNDDB) managed by the California Department of Fish and Wildlife, the West Oakland quad area species include a variety of flora and fauna. Some species examples include Cooper's hawk, white-tailed kite, great egret, great blue heron, American peregrine falcon, loggerhead shrike, and several bat species. Lake Merritt National Wildlife Refuge, since 1869 North America's first wildlife refuge, and home to numerous native and migratory birds on the Pacific Flyway, sits 1 mile away. Adjacent to West Oakland, a 331.29 acre Estuarine and Marine Wetland habitat is classified as a E2USN.[3] The San Pablo Bay National Wildlife Refuge is approximately 32 miles away. However, within the West Oakland Community Action Plan, no adopted, wetlands, or other sensitive communities are identified by the CA Department of Fish and Wildlife or the City of Oakland's General and West Oakland Specific Plans.

Regulatory Background

Biological resources are protected at the federal, state, and local level. Federal laws and regulations including by the U.S. Fish and Wildlife Service, under laws including the Federal Endangered Species Act (ESA), Migratory Bird Treaty Act, and Marine Mammal Protection Act; the National Oceanic and Atmospheric Administration (NOAA) Fisheries; and the– US Army Corps of Engineers, under laws including Clean Water Act, Section 404; and the US Environmental Protection Agency (EPA) under laws including the federal Clean Air Act and federal Clean Water Act; the State of California Department of Fish Wildlife under laws including the California Endangered Species Act (CESA), California Fish and Game Code (F &G), including Division 4 on Birds and Mammals Sections, the Native Plant Protection Act, and the Marine Life Protection Act.

The U.S. Army Corps of Engineers and the U.S. Environmental Protection Agency regulate the discharge of dredge or fill material into waters of the United States, including wetlands. The City of Oakland and/or Alameda County General Plans through land use and zoning requirements include goals and policies to minimize or prohibit development in biologically sensitive areas.

Significance Criteria

The proposed project's impacts on biological resources will be considered significant if:

[3] https://www.fws.gov/wetlands/Data/Mapper.html

- The project has 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 Game or U.S. Fish and Wildlife Service.
- The project has a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations or by the California Department of Fish and Game or US Fish and Wildlife Service.
- The project has a substantial adverse effect on state or federally protected wetlands (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means.
- The project interferes 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.
- The project conflicts with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance.

The project conflicts with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan.

Discussion of Impacts

4. a) and d) Less than Significant. Physical modifications associated with implementation of the AB 617 Community Plan would be limited to changes within an urbanized area. According to the Open Space, Conservation and Recreation Element of the City of Oakland General Plan, there are no candidate species, sensitive species, or special status species known to occur within the West Oakland area (City of Oakland, 2014). The proposed project may require the replacement or construction of new equipment in the West Oakland area, but those physical changes would occur in already urbanized and developed areas.

There are several special-status animals that may potentially use habitat in the project area, including the peregrine falcon, Cooper’s hawk, red-shouldered hawk, red-tailed hawk, pallid bat, silver-haired bat, hoary bat, and big free-tailed bat. Tree removal, building demolition and other construction activities can cause disturbance, noise or loss of habitat for resident or migratory birds and mammals, including special-status species that may forage in the project area. The City of Oakland enforces Standard Conditions of Approval on all development within the City including Tree Removal During Breeding Season. Under Tree Removal During Breeding Season, a preconstruction construction survey is required by a qualified biologist during the breeding season of March 15 and August 15 if any tree removal activities are required. If the survey indicates the potential presence of nesting raptors or other birds, an appropriately sized buffer is placed around the nest in which no work will be allowed until the young have fledged. Implementation of the existing City requirements and compliance with federal and state requirements would minimize the potential impacts of any project activities on nesting birds and minimize the potential impacts to less than significant with mitigations.

4. b) and c) No **Impact.** The State of California recognizes some plant communities as sensitive natural communities if they are uncommon, regionally declining, or vulnerable. Among these communities are riparian habitat, coast live oak forest, freshwater seeps, freshwater marshes, and coastal salt marsh. According to the Open Space, Conservation and Recreation Element of the City of Oakland General Plan, no significant riparian habitat, wetlands, or other sensitive natural communities remain within the West Oakland area (City of Oakland, 2014). Physical modifications associated with implementation of the AB617 Community Plan would be limited to changes within an urbanized area. The proposed project may require the construction or replacement of new equipment in the West Oakland area, but those physical changes would occur in already urbanized and developed areas. Therefore, the proposed project would not be expected to impact riparian, wetlands, or other sensitive communities.

4. e) Less **than Significant.** Future demolition and construction activities may require the removal of trees that are protected by the City of Oakland Tree Protection Ordinance. The City of Oakland Tree Protection Ordinance (Oakland Municipal Code Chapter 12.36) applies to the removal of protected trees under certain circumstances. Factors to be considered in determining significance include the number, types, size, location and condition of the protected trees to be removed or affected by construction and the protected trees to remain, with special consideration given to native trees. Protected trees include the following: (1) California or coast live oak (*Querus agrifolia*); and (2) any other tree measuring nine inches in diameter (at breast height), except *Eucalyptus* and *Pinus radiate* (Monterey pine). Any project that would involve the removal of any tree protected by the Tree Protection Ordinance would be required to first obtain a permit from the City and comply with any conditions of the permit, including replacement plantings and protection of remaining trees during construction activities. Compliance with City's Tree Project Ordinance would minimize potential conflicts with local policies or ordinance protecting biological resources to less than significant. Further, the WOAK AB 617 Community Plan is expected to encourage the planting of additional trees to provide buffers between industrial and residential areas and improved air quality in the West Oakland Area providing a beneficial impact on biological resources.

4. f) No Impact. City of Oakland is not within a Habitat Conservation Plan, Natural Community Conservation Plan or other adopted habitat conservation plan Therefore, the proposed project will not conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan.

Conclusion

Based upon the above considerations, significant adverse impacts to biological resources are not expected to occur due to the proposed project.

	Potentially Significant Impact	Less Than Significant Impact With Mitigation Incorporated	Less Than Significant Impact	No Impact
V. CULTURAL RESOURCES. Would the project:				
a) Cause a substantial adverse change in the significance of a historical resource pursuant to § 15064.5?	☐	☐	☑	☐
b) Cause a substantial adverse change in the significance of an archaeological resource pursuant to § 15064.5?	☐	☐	☑	☐
c) Disturb any human remains, including those interred outside of formal cemeteries?	☐	☐	☑	☐

Environmental Setting

The Bay Area, including Oakland, has a rich cultural history with evidence of human activity in prehistoric times, i.e., prior to 5,000 B.C, likely due to resources provided by the rivers, marshes and ocean. There was a prehistoric Native American shellmound and Ohlone burial ground in and around the Bay Street Shopping Center at Shellmound Street, Emeryville, one mile from West Oakland. Dating from 800 B.C., this shellmound, the largest of over 425 shellmounds that surrounded San Francisco Bay, is now California Historical Landmark #335.[4]

The arrival of the Spanish in the San Francisco Bay Area in 1775 led to a rapid reduction in native California populations. Diseases, declining birth rates, and the effects of the mission system served to eradicate aboriginal life. Brought into the missions, the surviving Native Americans were transformed from hunters and gatherers to agricultural laborers. With abandonment of the mission system and the Mexican takeover in the 1840s, numerous ranchos were established. The lands that eventually became Oakland were part of a Spanish land grant given to Luis Maria Peralta in 1820.

Human and economic activity increased when the transcontinental railroad arrived in 1869 and Oakland became home to enormous Central Pacific railroad yards, providing a job base where numerous businesses were established, and residential areas were developed. In 1941, the U.S. Army took over the entire Outer Harbor and filled it in. The area quickly developed with World War II-related industry and temporary housing for defense workers. A postwar building boom completed the area's development with heavy industrial uses

[4] See http://en.wikipedia.org/wiki/Emeryville_Shellmound

(metals, ship yards, construction materials, freight), such that West Oakland was largely industrial. To staff these industries, labor recruiters brought large number of both white and black workers from the South. Oakland's African-American population more than quintupled during the war years and many new residents settled in the established community of West Oakland.

Available space in West Oakland was limited and there was little room for the construction of new houses. Residents objected to the intense industrial development and were beginning to move to new tracts and larger houses in the lower hills during the building boom that followed the 1906 San Francisco earthquake.

In the mid-1950s, the industrially zoned, largely minority community of West Oakland was cut in half by a major public works project, the Cypress Freeway. In the following decades, several housing projects were built in West Oakland including the Acorn and neighboring projects of Oak Center, Westwood Gardens in Prescott, and Chestnut Court in McClymonds. Between 1969 and 1972, a new Post Office and the West Oakland BART Station were developed. In 1989, the Loma Prieta earthquake damaged many of the area's historic buildings, brought down the Cypress Freeway, and allowed for changes in Oakland.

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" (California Public Resources Code §5024.1[5]). 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 (14 California Code of Regulations (CCR) Chapter 3) §15064.5(b))[6]. 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 a 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). In addition, the Historic Preservation Element of the City of Oakland General Plan sets forth goals, objectives, policies, and actions for historic preservation in the City.

Significance Criteria

The proposed project impacts to cultural resources will be considered significant if:

- The project results in a substantial adverse change in the significance of a historical resources as defined in CEQA Guidelines §15064.5. A substantial adverse change includes physical demolition, destruction, relocation, or alteration

[5] All state code sections are accessible at https://leginfo.legislature.ca.gov/faces/codes.xhtml
[6] All state regulations in the California Code of Regulations are accessible at https://govt.westlaw.com/calregs/Search/Index .

of a resource or its immediate surroundings such that the significance of the historical resources would be materially impaired.

- Cause a substantial adverse change in the significance of an archaeological resources pursuant to CEQA Guidelines §15064.5.
- Disturb any human remains, including those interred outsides of formal cemeteries.

Discussion of Impacts

5 a) Less than Significant. In the City of Oakland, a historical resource under CEQA is defined as a resource that meets any of the following criteria:

A) A resources listed in, or determined to be eligible for listing in, the California Register of Historical Resources (California Register);

B) A resource included in Oakland's Local Register of Historical Resources (defined below), unless the preponderance of evidence demonstrates that it is not historically or culturally significant;

C) A resource identified as significant (e.g., status code 1-5) in a historical resource survey recorded on Department of Parks and Recreation Form 523, unless the preponderance of evidence demonstrates that it is not historically or culturally significant;

D) Any object, building, structure, site, area, place, record, or manuscript which the Oakland City Council determines to be historically significant or significant in the architectural, engineering, scientific, economic, agricultural, education, social, political, military, or cultural annals of California, provided the determination is supported by substantial evidence in light of the whole record. Generally, a resource is considered "historically significant" if it meets the criteria for listing on the California Register of Historical Resources (CEQA Guidelines §15064.5); or

E) A resource that is determined by the City council to be historically or culturally significant even though it does not meet the other four criteria.

There are approximately 1,421 Local Register properties within West Oakland. Of this total, the 32 designated historic properties and properties rated of the highest importance (National Register properties, landmarks, heritage properties, study list properties S-7 Preservation Combining Zone properties, and Potential Designated Historic Properties) within West Oakland are identified in Table 2-1. The great majority of the Local Register properties are located in the residential neighborhoods of West Oakland.

In addition, the City of Oakland recognizes three Areas of Primary Importance (API) that contain a total of approximately 831 contributing properties including 721 separate properties with the Oakland Point API, 84 contributing properties within the Oak Center API, and four contributing properties within the Southern Pacific Railroad Industrial API.

TABLE 2-1

Historic Properties within West Oakland[1]

Address	Historic Name	Local Designation	OCHS Rating	Date Built
2624 West Street	St. Augustine's Mission	Landmark	B+2+	1920
1716 7th Street	Brotherhood of Sleeping Car Porters Headquarters	Landmark-eligible	B*2+	1889-90
1611-17 & 1619 5th Street	Davidson-Patterson buildings	Study List	B*1+	1887-88
1522 8th Street	Wedgewood (Chas.) – Michel (August) house	Study List	C1+	1878-79
1561 8th Street	Lincoln (Harry) – Williams (Katherine) house	Study List	B-1+	1878-79
1267 14th Street	Nabisco plant	Study List	B+a3	1915-16
661 27th Street	Union French Bakery	Study List	C2+	1911-12
1909 Market Street	St. Andrew's Roman Catholic Church	Study List	B+3	1908-09
1717 Myrtle Street	Pearson (John Winfield & Allie M.) house	Study List	Cb+1+	1884-85
1600 7th Street	Flynn (Edward) Saloon – McAllister Plumbing	S-7 zoning	Ec2*	1885-86
1620-24 7th Street	Site of the former Lincoln Theater	S-7 zoning	-	-
1632-42 7th Street	Arcadia Hotel – Isaacs & Schwartz block	S-7 zoning	Db-2+	1906-07
3401-07 Adeline Street	Boman Building – North Oakland Reading Room	PDHP	A2+	1891
100-50 Linden Street	California Packing Corp. – Del Monte cannery	PDHP	A1+	1923
920 Peralta Street	St. Joseph's Institute – St. Patrick's Convent	PDHP	A1+	1912
1340 Mandela Parkway	Coca-Cola Company Bottling Plant	S-20 zoning	Cb+3	1939-40
1485-87 8th Street	Western Market – Father Divines' Peace Mission (Liberty Hall)	Landmark National Register	A1+	1877
3501 San Pablo Avenue	California Hotel	National Register	B+a3	1929-30
1601 Wood Street/1798 16th Street	Southern Pacific 16th Street Station	Landmark, National Register-eligible	-	-
1450-54 8th Street	Sam (Jacob) – Dalton (Henry) house	Landmark	Cb-1+	1877-78
1782 8th Street	Berry (E.W.) – Shorey (Wm. & Julia) house	Landmark/Heritage	B-a1+	1872-73
1079-81 12th Street	Cordes (H.C.) – Hoover (Herbert) house	Landmark	B+2+	1892-93
766-78 14th Street	Metcalf (Victor H.) house	Landmark	Cb+3	1909
954 16th Street	Holland (Daniel) – Canning (James & Mary) house	Landmark	A1+	1878-79
970-72 16th Street	Gladding (Charles) – Chickering (Wm.) house	Landmark	B-1+	1879-80

Address	Historic Name	Local Designation	OCHS Rating	Date Built
974 16th Street	Reed (George W.) – Henshaw (Edward) house	Landmark	B+1+	1879-80
1004-06 16th S Street	Quinn (Wm. H.) – Moran (James T.) house	Landmark	C1+	1872-73
1014 16th Street	Campbell (Robert A.) – Masino (A.) house	Landmark	A1+	1883-84
918 18th Street	Willcutt (Joseph) house	Landmark	B+1+	1889
730 29th Street	Oakland Laundry Co.	Landmark	B+3	-
1651 Adeline Street	DeFremery (Mary) – Grant (James) house	Landmark	A2+	1888-89
1529-31 Union Street	Davison (Seymour & Lucinda) house	Landmark	B+a2+	1884

Source: West Oakland Specific Plan – Draft EIR

[1] Local Register properties (or properties considered significant for purposes of environmental review under CEQA) within the Planning Area include those identified in this table, as well as S-20 Preservation Combining Zone properties, PDHPs with an existing rating of "B", and properties within an API.

The majority of Local Register properties within West Oakland are located within residential neighborhoods. Implementation of the control measures would not be expected to require the removal of any existing buildings or impact historic resources. In areas where there are sensitive historic resources, the City of Oakland requires pre-construction surveys and the use of qualified archaeological monitors during grading operations to identify historic resources. These standard requirements, along with the fact that the control strategies in the West Oakland Community Action Plan are not expected to impact or require removal of historic structures, would limit impacts on historic cultural resources to less than significant.

5. b) and c) Less than Significant. The West Oakland area is located on the margins of the San Francisco Bay shoreline and near locations of former intermittent and perennial watercourses, which were historically used by Native Americans. Thus, there is the potential for the presence of unrecorded cultural resources to be buried in West Oakland. Of the strategies that the District would implement, a number of them would apply to existing sources and could include replacing diesel engines, controlling emissions from existing breweries or wineries, and adding filtration systems to existing buildings. Other strategies would encourage the use of alternative fuels and zero emissions mobile sources (trucks, buses, locomotives). Implementation of these types of control measures would not be expected to require extensive construction or grading that could impact archaeological resources. In areas where there are sensitive resources, the City of Oakland requires pre-construction surveys and the use of qualified archaeological monitors during grading operations to identify historic resources. These standard requirements, along with the fact that the control strategies are the West Oakland Community Action Plan are not expected to require extensive construction or grading activities, are expected to limit impacts to historic cultural resources to less than significant.

Conclusion

Based upon the above considerations, significant adverse impacts to cultural resources are not expected to occur due to implementation of the Community Action Plan strategies and therefore, will not be further evaluated in the Draft EIR.

	Potentially Significant Impact	Less Than Significant Impact With Mitigation Incorporated	Less Than Significant Impact	No Impact
VI. ENERGY.				
Would the project:				
a) Result in potentially significant environmental impact due to wasteful, inefficient or unnecessary consumption of energy resources, during project construction or operations?	☑	☐	☐	☐
b) Conflict with or obstruct a state or local plan for renewable energy or energy efficiency?	☑	☐	☐	☐

Environmental Setting

Pacific Gas and Electric Company (PG&E) supplies electricity to over five million customers in central and northern California, including Oakland. Alameda County used over 11,112 gigawatt/hours (millions of kilowatt/hours) in 2017[7]. Residential electricity use accounts for approximately 28 percent of the electrical use and non-residential use accounts for approximately 72 percent. PG&E's electricity is supplied by natural gas power plants, nuclear generation, large hydroelectric facilities, and renewable sources (e.g., wind, geothermal, boil mass and small hydroelectric power). The City of Oakland operates three 55 megawatt (MW) fossil fuel plants that supplement PG&E's electricity generation.

In 2017 in California, about 34 percent of electricity was generated by natural gas, 29 percent was generated by renewables, 15 percent was generated by hydroelectric facilities, 9 percent was generated by nuclear, and 4 percent was generated by coal.[8]

In 2017, Alameda County used over 379 million therms of natural gas.[9] Residential use accounts for approximately 57 percent of natural gas consumption, and non-residential use accounts for approximately 43 percent of natural gas use in Alameda County.

---

[7] California Energy Commission, Electricity Consumption by County. Available at https://ecdms.energy.ca.gov/elecbycounty.aspx

[8] California Energy Commission, Total System Electric Generation. Available at: https://www.energy.ca.gov/almanac/electricity_data/total_system_power.html

[9] California Energy Commission, Gas Consumption by County. Available at: http://www.ecdms.energy.ca.gov/gasbycounty.aspx

Regulatory Background

Energy efficiency requirements are primarily regulated at the state level. Title 24, California's Energy Efficiency Standards for Residential and Non-residential Buildings, details requirements to achieve minimum energy efficiency standards. The standards apply to new construction of both residential and non-residential buildings, and regulate energy consumed for heating, cooling, ventilation, water heating, and lighting. Compliance with these standards is verified and enforced through the local building permit process.

The City of Oakland has developed the Oakland Sustainability Community Development Initiative which includes programs that encourage a variety of sustainability programs that range from the development of green building practices to the replacement of heavy-duty diesel trucks.

The City of Oakland adopted a Civic Green Building Ordinance in May 2005, requiring City owned and occupied buildings to meet specific green building standards set by the U.S. Green Building Council's Leadership in Energy and Environmental Design (LEED) rating system. In October 2010, the City adopted mandatory green building standards for private development projects. The intent of the mandatory green building standards is to integrate environmentally sustainable strategies in building construction and landscapes in Oakland (City of Oakland, 2014).

The Oakland Energy and Climate Action Plan was adopted by the City Council on December 4, 2012. The purpose of the Plan is to identify and prioritize actions that Oakland can take to reduce energy consumption and greenhouse gas emissions. The Plan recommends greenhouse gas reduction actions and establishes a framework for coordinating implementation, as well as monitoring and reporting progress. Implementation of renewable energy and energy efficiency measures include measures to reduce vehicle miles traveled annually by 20 percent, electricity consumption by 32 percent, and natural gas consumption by 14 percent (City of Oakland, 2014).

Significance Criteria

The impacts to energy resources will be considered significant if any of the following criteria are met:

- The project conflicts with adopted energy conservation plans or standards.
- The project results in substantial depletion of existing energy resource supplies.
- An increase in demand for utilities impacts the current capacities of the electric and natural gas utilities.
- The project uses non-renewable resources in a wasteful and/or inefficient manner.

Discussion of Impacts

6. a and b) Potentially Significant: Of the strategies that the District would implement, a number of them would apply to existing sources and could include replacing diesel engines, controlling emissions from existing facilities, and adding filtration systems to existing buildings. Other strategies would encourage the use of alternative fuels and zero emissions mobile sources (trucks, buses, locomotives), and provide shore power for ships. Implementation of these types of control measures would not be expected to use energy in a wasteful, inefficient or unnecessary manner, or conflict with an energy conservation plan. However, control measures that encourage zero emission mobile sources would increase electricity use, potentially requiring additional electricity or energy infrastructure. As such, the potential increase in energy consumption associated with the Community Action Plan will be evaluated in the EIR.

Conclusion

Implementation of the Community Action Plan could increase use of electricity associated with zero emission mobile sources and providing shore power to ships. Therefore, the potential adverse impacts associated with increased energy requirements will be evaluated in the Draft EIR.

		Potentially Significant Impact	Less Than Significant Impact With Mitigation Incorporated	Less Than Significant Impact	No Impact
VII.	**GEOLOGY AND SOILS.** Would the project:				
a)	Directly or indirectly cause 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.	☐	☐	☑	☐
ii)	Strong seismic ground shaking?	☐	☐	☑	☐
iii)	Seismic-related ground failure, including liquefaction?	☐	☐	☑	☐
iv)	Landslides?	☐	☐	☑	☐
b)	Result in substantial soil erosion or the loss of topsoil?	☐	☐	☑	☐
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?	☐	☐	☑	☐
d)	Be located on expansive soil, as defined in Table 18-1-B of the California Building Code, creating substantial direct or indirect risks to life or property?	☐	☐	☑	☐
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?	☐	☐	☐	☑

f)	Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature.	☐	☐	☑	☐

Environmental Setting

California has 11 natural geologic regions, known as geomorphic provinces, which are defined by the presence of similar physical characteristics, such as relief, landforms, and geology. Most of the Bay Area is located within the natural region of California known as the Coast Ranges geomorphic province, with the eastern portions of Contra Costa and Alameda Counties extending into the neighboring Great Valley geomorphic province, located east of the Coast Ranges. The Coast Range extends about 400 miles from Oregon south into Southern California and is characterized by a series of northwest trending ridges and valleys that roughly parallel the San Andreas fault zone. The San Francisco Bay is a broad, shallow regional structural depression created from an east-west expansion between the San Andreas and the Hayward fault systems.

Much of the Coast Range province is composed of marine sedimentary and volcanic rocks located east of the San Andreas Fault. The regional west of the San Andreas Fault is underlain by a mass of basement rock that is composed of mainly marine sandstone and various metamorphic rocks. Marginal lands surrounding San Francisco Bay consist generally of alluvial plains of low relief that slope gently towards the bay from bordering uplands and foothills (ABAG, 2017). 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 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.

West Oakland is located on the San Francisco Bay, which is a seismically active region, situated on a tectonic plate boundary marked by the San Andreas 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). The San Andreas and the Hayward faults are the two faults considered to have the highest probabilities of causing a significant seismic event in the Bay Area. These two faults are classified as strike-slip faults that have experienced movement within the last 150 years. The Hayward fault is the closest fault to West Oakland, located approximately 3.5 miles to the east along the southwestern base on the East Bay hill, paralleling Highway 13. Other principal faults capable of producing significant ground shaking in the Bay Area are included in Table 2-2, and include the Rodgers Creek-Healdsburg, Concord-Green Valley, Marsh Creek-Greenville, San Gregorio-Hosgri, West Napa and Calaveras faults (ABAG, 2017). A major seismic event on any of these active faults could cause significant ground shaking and potential surface fault rupture.

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.

TABLE 2-2

Active Faults in the Bay Area

Fault	Recency of Movement	Maximum Moment Magnitude Earthquake
San Andreas	1989	7.9
Hayward	1868	7.1
Rodgers Creek-Healdsburg	1969	7.0
Concord-Green Valley	1955	6.9
Marsh Creek-Greenville	1980	6.9
San Gregorio-Hosgri	Late Quaternary	7.3
West Napa	2000	6.5
Maacama	Holocene	7.1
Calaveras	1990	6.8
Mount Diablo Thrust	Quaternary	6.7

(Source: ABAG, 2017)

Regulatory Background

Construction is regulated by, among other things, the City of Oakland building codes that provide requirements for 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.

The City or County General Plan includes the Seismic Safety Element. The Element serves primarily to identify seismic hazards and their location in order that they may be considered 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 Hazards 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 reviewing procedures that will reduce losses from ground failure during future earthquakes.

Significance Criteria

The proposed project impacts on the geological environment will be considered significant if:

- Topographic alterations would result in significant changes, disruptions, displacement, excavation, compaction or over covering of large amounts of soil.
- Unique geological resources (paleontological resources or unique outcrops) are present that could be disturbed by the construction of the proposed project.
- Exposure of people or structures to major geologic hazards such as earthquake surface rupture, ground shaking, liquefaction or landslides.
- Secondary seismic effects could occur which could damage facility structures, e.g., liquefaction.
- Other geological hazards exist which could adversely affect the facility, e.g., landslides, mudslides.

Discussion of Impacts

7. a, c and d) Less than Significant**.** The West Oakland Community Action Plan could require changes at certain industrial facilities. These facilities may need to install additional air pollution control equipment, modify their facilities, built new infrastructure, or install filtration equipment.

New development potentially resulting in earthquake hazards is expected to be limited to the construction of air pollution control equipment or measures at industrial facilities. New construction (including modifications to existing structures) requires compliance with the California Building Code. 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”). 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. Therefore, no significant impacts would be expected.

7. b) Less than Significant. Construction associated with strategies in the Plan would be limited to urban areas, and primarily industrial facilities. All construction would take place at already existing facilities that have been previously graded. Thus, the proposed project is not expected to result in substantial soil erosion or the loss of topsoil as construction activities are expected to be limited to existing operating facilities that have been graded and developed, so that no major grading would be required.

7. e) No Impact. Septic tanks or other similar alternative wastewater disposal systems are typically associated with small residential projects in remote areas. The West Oakland Community Action Plan would affect an existing urban area that has existing wastewater treatment systems and does not rely on septic tanks or similar alternative wastewater disposal systems. Based on these considerations, septic tanks or other alternative wastewater disposal systems are not expected to be impacted by the proposed project.

7. f) Less than Significant. As discussed in 5 b and 5 c above, the West Oakland area is located on the margins of the San Francisco Bay shoreline. Of the strategies that the District would implement, a number of them would apply to existing sources and could include replacing diesel engines, controlling emissions from existing facilities, and adding filtration systems to existing buildings. Other strategies would encourage the use of alternative fuels and zero emissions mobile sources (trucks, buses, locomotives). Implementation of these types of control measures would not be expected to require extensive construction or grading that could impact paleontological resources. In areas where there are sensitive resources, the City of Oakland requires pre-construction surveys and the use of qualified archaeological and paleontological monitors during grading operations to identify historic resources. These standard requirements, along with the fact that the control strategies in the West Oakland Community Action Plan are not expected to require extensive construction or grading activities, are expected to limit impacts on paleontological resources to less than significant.

Conclusion

Based upon the above considerations, significant adverse impacts to geology and soils are not expected to occur due to implementation of the West Oakland Community Action Plan strategies and therefore, will not be further evaluated in the Draft EIR.

	Potentially Significant Impact	Less Than Significant Impact With Mitigation Incorporated	Less Than Significant Impact	No Impact
VIII. GREENHOUSE GAS EMISSIONS.				
Would the project:				
a) Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment?	☑	☐	☐	☐
b) Conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases?	☑	☐	☐	☐

Environmental 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 climate change is caused primarily by an increase in levels of greenhouse gases (GHGs) in the atmosphere. The major greenhouse gases are the so-called "Kyoto Six" gases – carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), sulfur hexafluoride (SF_6), hydrofluorocarbons (HFCs), and perfluorocarbons (PFCs) – as well as black carbon.[10] These greenhouse gases absorb longwave radiant energy (heat) reflected by the earth, which warms the atmosphere in a phenomenon known as the "greenhouse effect." The potential effects of global climate change include rising surface temperatures, loss in snow pack, sea level rise, ocean acidification, more extreme heat days per year, and more drought years.

Increases in the combustion of fossil fuels (e.g., gasoline, diesel, coal, etc.) since the beginning of the industrial revolution have resulted in a significant increase in atmospheric levels of greenhouse gases. CO_2 levels have increased from long-term historical levels of around 280 ppm before the mid-18th century to over 400 ppm today. This increase in greenhouse gases has already caused noticeable changes in the climate. The average global temperature has risen by approximately 1.4°F (0.8°C) over the past one hundred years, and 16 of the 17 hottest years in recorded history have occurred since 2001, according to the National Oceanic and Atmospheric Administration.

[10] Technically, black carbon is not a gas but is made up of solid particulates or aerosols. It is included in the discussion of greenhouse gas emissions because, like true greenhouse gases, it is an important contributor to global climate change.

Total global greenhouse gas emissions contributing to climate change are in the tens of billions of metric tons of CO_2e per year. The State of California alone produces about two percent of the entire world's GHG emissions with major emitting sources including fossil fuel consumption from transportation (37 percent), electricity production (20 percent), industry (24 percent), agricultural and forestry (8 percent), residential activities (6 percent), and commercial activities (5 percent) (ABAG, 2017). The Bay Area's contribution to the global total is approximately 85 million tons per year. Transportation sources generate approximately 40 percent of the total, with the remaining 60 percent coming from stationary and area sources (BAAQMD, 2017b).

Regulatory Background

California has committed to reducing its greenhouse gas emissions to 1990 levels by 2020, to 40 percent below 1990 levels by 2030, and to 80 percent below 1990 levels by 2050. This commitment was enacted in AB 32, the Global Warming Solutions Act of 2006, which adopted the 2020 target; in 2016's SB 32 (Pavley), which adopted the 2030 target; and in Executive Order S-3-05, which adopted the 2050 target. The Air District has adopted the same 80 percent reduction target for 2050 for the Bay Area's greenhouse gas emissions, in Board of Directors Resolution 2013-11.

To achieve these emission reduction goals, the California Legislature has directed the California Air Resources Board (CARB) to develop a Scoping Plan setting forth regulatory measures that CARB will implement, along with other measures, to reduce the state's greenhouse gas emissions. One of the principal regulatory measures is CARB's Cap and Trade program, which requires industrial greenhouse gas sources to obtain "allowances" equal to their greenhouse gas emissions. The amount of available allowances is subject to a "cap" on total emissions statewide, which CARB will reduce each year. Regulated facilities will either have to reduce their emissions or purchase allowances on the open market, which will give them a financial incentive to reduce emissions and will ensure that total annual emissions from the industrial sector will not exceed the declining statewide cap.

California has also adopted the "Renewable Portfolio Standard" for electric power generation, which requires that at least 33 percent of the state's electric power must come from renewable sources by 2020, and at least 50 percent must come from renewables by 2030. To complement these efforts on electricity generation, the state has also committed to increasing the energy efficiency of existing buildings by 50 percent by 2050 in order to reduce energy demand.

California has adopted regulatory measures aimed at reducing greenhouse gas emissions from mobile sources. These measures include standards for motor vehicle emissions and the state's Low Carbon Fuel Standard, which set limits on the carbon intensity of transportation fuels. California has also adopted SB 375, the Sustainable Communities and Climate Protection Act of 2008, which requires regional transportation and land use planning agencies to develop coordinated plans, called "Sustainable Communities Strategies," to reduce greenhouse gas emissions from the transportation sector by promoting denser development and alternatives to driving. The current Sustainable Communities Strategy for the Bay Area is *Plan Bay Area 2040*, which was adopted by the Metropolitan Transportation Commission and the Association of Bay Area Governments in July of 2017.

The Air District has committed to reducing the Bay Area's regional greenhouse gas emissions to 80 percent below 1990 levels by 2050, as noted above. The Air District has also committed to a broad suite of specific measures to address greenhouse gases in the 2017 Clean Air Plan, *Spare the Air, Cool the Climate*. That document lays out the Air District's vision for what the Bay Area may look like in a post-carbon year 2050 and describes policies and actions that the region needs to take in the near- to mid-term to achieve these goals.

In 2009, the Oakland City Council directed staff to develop an Energy and Climate Action Plan using preliminary planning GHG target equivalent to 36 percent below 2005 GHG emissions by 2020 and 80 percent below 2005 levels by 2050, with annual benchmarks for meeting the target. Based on Oakland's 2005 baseline GHG inventory, a total of approximately three million metric tons of GHG emissions and current forecasts of business-as-usual emissions growth, reducing GHG emissions by the equivalent of 36 percent below 2005 levels by 2020 will require taking actions that would result in 1.1 million metric tons of GHG emissions. On December 2, 2012, Oakland adopted the Energy and Climate Action Plan which evaluates and prioritizes opportunities to reduce energy consumption and GHG emissions in its own government operations and throughout the community

Significance Criteria

The most recently available Air District 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 District draft CEQA Guidelines (BAAQMD, 2017a) established a GHG threshold for air quality plans of "no net increase in emissions," which is appropriate for air quality plans because they include a mix of 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. Because the proposed project is a Community Action Plan with the goal of reducing emissions, the GHG threshold for air quality plans of "no net increase in emissions" will apply to the proposed project.

Discussion of Impacts

Global climate change refers to changes in average climatic conditions on earth as a whole, including temperature, wind patterns, precipitation and storms. Global warming, a related concept, is the observed increase in 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), hydrofluorocarbons (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.

8. a and b) Potentially Significant. Some control measures could potentially require modifications to refineries or other facilities and would require the generation of additional electricity to operate mobile sources which could generate additional GHG emissions. However, the implementation of these types of control measures would not be expected to generate a substantial increase in GHG emissions.

Implementation of the Community Action Plan could increase use of electricity associated zero emission mobile sources and providing shore power to ships. Therefore, the potential cumulative GHG emission impacts associated with increased energy requirements and generation of additional electricity will be evaluated in the Draft EIR.

		Potentially Significant Impact	Less Than Significant Impact With Mitigation Incorporated	Less Than Significant Impact	No Impact
IX.	**HAZARDS & HAZARDOUS MATERIALS.** Would the project:				
a)	Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials?	☑	☐	☐	☐
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?	☑	☐	☐	☐
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?	☑	☐	☐	☐
d)	Be located on a site that is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, would it create a significant hazard to the public or the environment?	☐	☐	☑	☐
e)	For a project located within an airport land use plan or, where such a plan has not been adopted, be 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?	☐	☐	☐	☑
f)	Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?	☐	☐	☑	☐
g)	Expose people or structures, either directly or indirectly, to a significant risk of loss, injury or death involving wildland fires?	☐	☐	☐	☑

Environmental Setting

West Oakland was one of the first industrial locations in the San Francisco Bay Area, later became a center for defense related industries, and continues to be a major transportation hub and industrial zone. Over the years, many transportation and industrial uses have relocated and closed, and some industrial properties have been abandoned and left contaminated (City of Oakland, 2014).

West Oakland today contains a mix of industrial, commercial, transportation, and residential uses. Industrial uses are often located adjacent to or near residential and other sensitive land uses, such as schools and parks. Many ongoing industrial operations use, store or transport hazards materials, and contaminated sites and groundwater remain in the area, posing a potential hazard to human health and the environment (City of Oakland, 2014).

In California, regulatory databases listing hazardous materials sites provided by federal, state and local agencies are consolidated in the “Cortese List” pursuant to Government Code Section 65962.5. In addition, the Alameda County Department of Environmental Health maintains a list of sites for which it is the administrative agency responsible for coordination and enforcement of local, state, and federal hazardous materials management and environmental protection programs, as recognized by the California Department of Toxics Substances Control.

A review of the Cortese List indicates that there is a total of 123 reported environmental cases within West Oakland. The majority of reported environmental cases are attributed to leaking underground storage tanks, most of which contain (or used to contain) motor oil, gasoline or other similar petroleum products. Nearly 65 percent of the cases have been closed by the respective oversight agencies. Of those cases that remain open, remediation efforts are still needed before new development can occur. Within those closed case sites, the level of prior clean-up efforts may vary and may be appropriate only for commercial or industrial uses, may have deed restrictions preventing sensitive land uses, or may stipulate additional agency oversight may be required is development is being considered (City of Oakland, 2014).

In addition to contaminated sites, a number of facilities within West Oakland process 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. 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 toxic gas clouds; torch fires (gas and liquefied gas releases), flash fires (liquefied gas releases), pool fires, and vapor cloud explosions (gas and liquefied gas releases), thermal radiation (heat generated by fire), and explosion/overpressure.

There are approximately six large quantity hazardous waste generators, 73 small quantity generators, 90 storage tanks, 87 dry cleaners, and 72 auto related industries (City of Oakland, 2014). 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. Because the use and handling of hazardous materials at permitted sites are subject to strict regulation, the potential for a release of hazardous materials from these sites is considered low

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][11], facilities which use, store, manufacture, handle, process, or move highly hazardous materials must prepare a fire prevention plan. In addition, 29 CFR § 1910.119, Process Safety Management (PSM) of Highly Hazardous Chemicals, and Title 8 of the California Code of Regulations (CCR), General Industry Safety Order §5189, Process Safety Management of Acutely Hazardous Materials, specifies required prevention program elements to protect workers at facilities that handle toxic, flammable, reactive, or explosive materials.

Section 112 (r) of the federal Clean Air Act [42 U.S.C. 7401 et seq.[12]] as amended by the Amendments of 1990, 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) and hazardous materials management plans to prevent accidental releases of these substances. U.S. Environmental Protection Agency regulations on chemical accident prevention are set forth in 40 CFR Part 68. In California, the California Accidental Release Prevention (CalARP) Program regulations (CCR Title 19, Division 2, Chapter 4.5) were 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.

Affected facilities that store materials are required to have Spill Prevention Control and Countermeasure (SPCC) Plan per the requirements of Title 40, Code of Federal Regulations, Part 112. The SPCC is designed to prevent spills from on-site facilities and includes requirements for secondary containment, provides emergency response procedures, establishes training requirements, and so forth.

---

[11] All federal regulations are accessible at https://codes.findlaw.com/cfr/#dirsearch2 .
[12] All federal statutes are accessible at https://codes.findlaw.com/us/ . "Et seq." means also including the sections that follow the cited section(s).

The Hazardous Materials Transportation (HMT) Act, as amended and codified, 49 U.S.C. §§ 5101 et seq., is the federal law 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, §171.15(a)). The California Department of Transportation (Caltrans) sets standards for trucks in California. These state regulations are enforced by the California Highway Patrol, among others.

The California Department of Toxic Substances Control (DTSC) is authorized by the U.S. Environmental Protection Agency (US EPA) to enforce and implement federal hazardous materials laws and regulations in California. California regulations pertaining to hazardous materials are equal to or exceed the federal regulation requirements. The DTSC is authorized by the US EPA to regulate the management of hazardous substances including the remediation of sites contaminated by hazardous substances. State hazardous materials regulations are contained in Title 22, Division 4.5 of the California Code of Regulations, Environmental Health Standards for the Management of Hazardous Waste. DTSC generally acts as the lead agency for soil and groundwater cleanup projects that affect public health and establishes cleanup levels for subsurface contamination that are equal to, or more restrictive than, federal levels. DTSC has also developed land disposal restrictions and treatment standards for hazardous waste disposal in California. DTSC has also developed brownfield programs to promote and expedite the cleanup of brownfields.

California Health and Safety Code Section 25500 et seq., codifying Assembly Bill 2185 (Maxine Waters 1985), 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.

Significance Criteria

The proposed project 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.

- Be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, would it create a significant hazard to the public or the environment
- Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school

Discussion of Impacts

9. a, b, and c) Potentially Significant. Of the strategies that the District would implement, a number of them would apply to existing sources and could include replacing diesel engines, controlling emissions from existing facilities and adding filtration systems to existing buildings. Implementation of these types of control measures would not be expected to result in the use of hazardous materials or create hazardous conditions.

Other strategies would encourage the use of alternative fuels and zero emissions mobile sources (trucks, buses, locomotives), and provide shore power or use a bonnet system for ships. These types of control measures could require modifications to refineries or other facilities to produce alternative fuels and would require the generation of additional electricity to operate mobile sources which could create new hazards at refineries and electrical-generating facilities. In addition, emission controls on ships could include the use of selective catalytic reduction (SCR) units to minimize nitrogen oxide emissions. SCR systems require the use of ammonia, a hazardous material. A total of eleven schools are located within the West Oakland Community Action Plan. As such, the potential hazards associated with implementation of these control strategies in the Community Action Plan will be evaluated in the EIR.

9. d) Less than Significant. 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. As discussed above, a number of sites within West Oakland are included on the hazardous materials sites list pursuant to Government Code §65962.5. Implementation of control strategies could require development or modifications to sites included on hazardous materials list. The facilities that may be affected by the proposed control strategies would be required to continue to manage any and all hazardous materials in accordance with federal, state, and local regulations. Implementing the control strategies would not be expected to interfere with site cleanup activities or create additional site contamination. As a result, the proposed project is not expected to affect any facilities included on a list of hazardous material sites and, therefore, would not create a significant hazard to the public or environment.

9. e) No Impact. West Oakland is not located within an airport land use plan area or within two miles of a public airport, public use airport, or near a private airstrip. The closest airport is Oakland International Airport which is over 6 miles southeast of West Oakland. The proposed project is not expected to result in a safety hazard for people residing or working within two miles of a public airport or air strip. Therefore, the Community Action Plan would have no impact on safety hazards for people residing or working in the project area.

9. f) Less than Significant. The Oakland Office of Emergency Services has identified a network of evacuation routes and potential emergency shelters. The emergency evaluation routes within West Oakland are 7th Street, 14th Street, 12th Street, 27th Street, 35th Street, Adeline Street, Market Street, Martin Luther King Jr. Boulevard, San Pablo Avenue, and West Grand Avenue (City of Oakland, 2014).

Of the strategies that the District would implement, a number of them would apply to existing sources and could include replacing diesel engines, controlling emissions from existing facilities, and adding filtration systems to existing buildings. Other strategies would encourage the use of alternative fuels and zero emissions mobile sources (trucks, buses, locomotives), and provide shore power for ships. Implementation of these types of control measures would not be expected to interfere with an adopted emergency response plan or emergency evacuation plan. Any need for traffic lane reductions or street closure due to construction would be short-term, temporary and localized. Individual future projects would be required to obtain an encroachment permit from the City for any proposed changes to, or construction use, of street rights-of-way, which would include review and notification to the Oakland Fire Department. Standard notification is required to ensure that the Oakland Fire Department is notified and award of construction traffic that could block any City Streets. Therefore, implementation of the Community Action Plan would neither be expected to impair implementation of, nor to interfere with any adopted emergency response plan or emergency evacuation plan.

9. g) No Impact. The California Department of Forestry and Fire Protection (CalFIRE) maps areas of significant fire hazard based on fuels, terrain, weather, and other relevant factors. These zones, referred to as Fire Hazard Severity Zones, determine the requirements for special building codes designed to reduce the potential impacts of wildland fires on urban structures. West Oakland is located within a non-Very High Fire Hazard Severity Zone, as the area is urbanized and not located directly adjacent to wildland areas. The area is outside Oakland's Wildfire Prevention Assessment District boundary, which indicates that it is not subject to significant wildfire hazard. Implementation of the Community Action Plan would be expected to have no impact related to wildland fires.

Conclusion

Implementation of the Community Action Plan could result in new hazards associated modifications to refineries and energy-generating facilities, as well as the increased use of hazardous materials associated with air pollution control equipment. As such, the potential hazards associated with implementation of these control strategies in the Community Action Plan will be evaluated in the EIR.

Based upon the above considerations, adverse hazard impacts, associated with hazardous materials sites, compiled pursuant to Government Code Section 65962.5, airport land use plans, safety at public and private airports, emergency response plans, emergency evacuation plans, and wildland fires, are not expected to be significant due to implementation of the Community Action Plan strategies.

		Potentially Significant Impact	Less Than Significant Impact With Mitigation Incorporated	Less Than Significant Impact	No Impact
X. HYDROLOGY AND WATER QUALITY.					
	Would the project:				
a)	Violate any water quality standards or waste discharge requirements or otherwise substantially degrade surface or ground water quality?	☐	☐	☑	☐
b)	Substantially decrease groundwater supplies or interfere substantially with groundwater recharge such that the project may impede sustainable groundwater management of the basin?	☐	☐	☐	☑
c)	Substantially alter the existing drainage pattern of the site or area, including through alteration of the course of a stream or river or through the addition of impervious surfaces, in a manner that would:				
i)	result in substantial erosion or siltation onsite or offsite;	☐	☐	☑	☐
ii)	substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or offsite;	☐	☐	☑	☐
iii)	create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff;	☐	☐	☑	☐
iv)	impede or redirect flood flows?	☐	☐	☑	☐
d)	In flood hazard, tsunami, or seiche zones, risk release of pollutants due to project inundation?	☐	☐	☑	☐
e)	Conflict with or obstruct implementation of a water quality control plan or sustainable groundwater management plan?	☐	☐	☐	☑

Environmental Setting

The City of Oakland is responsible for the construction and maintenance of the local storm drainage system, while the Alameda County Flood Control and Water Control District constructs, operates, and maintains major trunk lines and flood control facilities in Oakland.

The City of Oakland is within the Alameda County Flood Control and Water Control District Zone 12 (which also includes Emeryville), the largest of the District's zones. Zone 12 has approximately 50 miles of closed conduit, approximately 10 miles of earthen and concrete channels, as well as the existing natural waterways which transfer stormwater to the San Francisco Bay (City of Oakland, 2014).

West Oakland is part of a drainage basin that flows to a pump station located at the intersection of Ettie and 34th Streets. While the piping network is a City facility, the pump station itself is owned and operated by Alameda County Flood Control and Water Control District. The pump station was installed by the City of Oakland in 1954 and was taken over by that District in 1997. It includes six working pumps capable of pumping just over 500,000 gallons per minute (gpm). There has never been flooding in the area as a result of the pump failing (City of Oakland, 2014).

Stormwater runoff within West Oakland is conveyed by gravity through storm drain pipes to the Alameda County Flood Control and Water Control District Ettie Street Pump Station, located at the northern end of Ettie Street near I-580, where the stormwater is lifted and discharged to the Bay.

The City of Oakland Storm Drainage Master Plan estimates that 30 percent of the existing storm drainage conduits and all of the storm drainage structures within West Oakland need rehabilitation. The Master Plan also indicates that system capacity upgrades are also needed throughout West Oakland, especially within the commercial and industrial area near West Grand/Mandela and 3rd Street (City of Oakland, 2014).

See Section XIX – Utilities and Service Systems, for a description of existing water and wastewater treatment facilities.

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. Environmental Protection Agency to set the pretreatment standards. The regulations also allow the local treatment plants and others 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. Environmental Protection Agency to regulate, under the National Pollutant Discharge Elimination System (NPDES) program, discharges from industries and large municipal sewer systems. The U.S. Environmental Protection Agency 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. Environmental Protection Agency requirements, to specified industrial and other entities.

The Porter-Cologne Water Quality Act, California Water Code Division 7 and related sections, 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 Board administers 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 Clean Water Act, the State Water Resources Control Board prepared two state-wide plans in 1991 and 1995 that address storm water runoff: the California Inland Surface Waters Plan and the California Enclosed Bays and Estuaries Plan, which have been updated in 2005 as the Policy for Implementation of Toxics Standards for Inland Surface Waters, Enclosed Bays, and Estuaries of California. Enclosed bays are indentations along the coast that enclose an area of oceanic water within distinct headlands or harbor works. San Francisco Bay, and its constituent parts, including Carquinez Strait and Suisun Bay, fall under this category.

The San Francisco Bay Basin Plan identifies the: (1) beneficial water uses that need to be protected; (2) the water quality objectives needed to protect the designated beneficial water uses; and (3) strategies and time schedules for achieving the water quality objectives.

Significance Criteria

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 263,000 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 National Pollutant Discharge Elimination System (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.
- The project results in substantial increases in the area of impervious surfaces, such that interference with groundwater recharge efforts occurs.
- The project results in alterations to the course or flow of floodwaters.

Water Demand:

The existing water supply does not have the capacity to meet the increased demands of the project, or the project would use a substantial amount of potable water.

The project increases demand for water by more than 300,000 gallons per day.

Discussion of Impacts

10. a) Water Quality Standards and Waste Discharge Requirements

Less than Significant. Of the strategies that the District would implement as part of the Community Action Plan, a number of them would apply to existing sources and could include replacing diesel engines, controlling emissions from existing facilities, and adding filtration systems to existing buildings. Other strategies would encourage the use of alternative fuels and zero emissions mobile sources (trucks, buses, locomotives), and provide shore power or bonnet systems for ships. Implementation of strategies such as replacing diesel engines, adding filtration systems to existing buildings, the use of zero emission sources, producing alternative fuels and generating additional electricity would not be expected to result in water use or wastewater discharge. The control strategies would not be expected to require the use of additional water, result in the discharge of wastewater, or result in impacts to water quality, since the control strategies do not involve the use of water.

Construction activities associated with land disturbance of more than one acre would requirement compliances with the Construction General Permit for Discharges of Storm Water Associated with Construction Activity Water Quality (Order No. 99-08-DWQ, NPDES No. CAS000002).

Should any wastewater be generated, compliance with existing General Plan policies, Municipal Code regulations, and federal, state and local regulations would reduce impacts related to wastewater discharge to less than significant.

10. b) Ground Water Supplies

No Impact. West Oakland is underlain by the East Bay Plain groundwater basin. The San Francisco Regional Water Quality Control Board has identified groundwater supplies in this basin for municipal, industrial, and agricultural water supply. Impacts to the aquifer would occur if actions in accordance with the Community Action Plan would result in reduced recharge to the aquifer or increased extraction for the aquifer. However, the East

Bay Municipal Utility District, the major water purveyor for Oakland, relies on surface water supplies. The groundwater basin is not currently being used for municipal water supply (City of Oakland, 2014).

Of the strategies that the Air District would implement as part of the Community Action Plan, a number of them would apply to existing sources and could include replacing diesel engines, controlling emissions from existing facilities, and adding filtration systems to existing buildings. Other strategies would encourage the use of alternative fuels and zero emissions mobile sources (trucks, buses, locomotives), and provide shore power or bonnet systems for ships. Implementation of strategies such as replacing diesel engines, adding filtration systems to existing buildings, the use of zero emission sources, producing alternative fuels and generating additional electricity would not be expected to require the use of additional water or groundwater. As a result, implementation of the Community Action Plan would not substantially decrease groundwater supplies or interfere substantially with groundwater recharge such that the project may impede sustainable groundwater management of the basin. Impacts to groundwater would be less than significant.

10. c) Surface Water

Less Than Significant. As discussed above, the control strategies that the District would implement are not expected to require extensive construction or grading, that would result in alteration of the existing drainage pattern of the area or increase the rate or amount of surface water runoff. The West Oakland area is urbanized and developed so the project is not expected to add impervious surfaces that would alter surface water runoff. Further, there are no natural streams or rivers in the West Oakland area, so the project would not alter the course of a stream or river. Therefore, the impact of the Community Action Plan on surface water discharge is expected to be less than significant.

10. d) Flooding, seiche, tsunami

Less than Significant. No portion of West Oakland is located within a 100-year or 500-year flood hazard area, as mapped on the National Flood Insurance Program Flood Insurance Rate Maps prepared by the Federal Emergency Management Agency. All of West Oakland is designated Zone X, which means that it is an area determined to be an area of minimal flood hazard, outside the 0.2 percent annual chance floodplain (City of Oakland, 2014). For this reason, implementation of the Community Action Plan would not result in substantial flooding on- or off-site; would not expose people or structures to a substantial risk of loss, injury, or death involving flooding; would not impede or redirect flood flows or place structures within a 100-year flood hazard area.

A seiche is a tidal change in an enclosed or semi-enclosed water body caused by sustained high winds or an earthquake. There is no data on the local occurrence or impact of seiches, as none has been recorded in the Bay Area (City of Oakland, 2012). No enclosed or semi-enclosed water body, if any, in West Oakland is located close enough to the San Francisco Bay to be affected by a seiche (City of Oakland, 2014).

Tsunamis are seismically induced sea waves that, upon entering shallow near-shore waters, may reach heights capable of causing widespread damage to coastal areas. The western portion of West Oakland, generally west of Mandela Parkway, is subject to tsunami inundation (City of Oakland, 2014).

The National Weather Service operates the Alaska Tsunami Warning Center in Palmer, Alaska which serves as the regional tsunami warning center for Alaska, British Columbia, Washington, Oregon, and California. In the event that an earthquake occurred that would be capable of producing a tsunami that could affect West Oakland, the City of Oakland would receive the warning through the State Warning System. In addition, the Oakland Office of Emergency Services operates a network of outdoor warning sirens to alert the public in case of an emergency. There are sirens installed at three locations in West Oakland: the Goss Avenue/Pine Avenue intersection, Poplar Recreation Area, and Lafayette Square.

The Alaska Tsunami Warning Center, State Warning System and Oakland emergency alert system, including the outdoor warning sirens in West Oakland, would provide early notification of an advancing tsunami allowing evacuation of people. Given the rare occurrence of tsunamis, the distance of West Oakland to the Bay shoreline, and the emergency alert system enabling evacuation of people, implementation of the Community Action Plan would not place additional structures in areas that are expected to be impacted by tsunami inundation.

10. e) Water Quality Control Plan or Sustainable Groundwater Management Plan

No Impact. As discussed above, the East Bay Municipal Utility District, the major water purveyor for Oakland, relies on surface water supplies. The groundwater basin is not currently being used for municipal water supply (City of Oakland, 2014). Further, implementation of the Community Action Plan is not expected to require additional water supplies. Therefore, the proposed project would not conflict with or obstruct implementation of a water quality control plan or sustainable groundwater management plan

Conclusion

Based upon the above considerations, no significant adverse hydrology and water quality impacts are expected to occur due to implementation of the Community Action Plan strategies.

	Potentially Significant Impact	Less Than Significant Impact With Mitigation Incorporated	Less Than Significant Impact	No Impact
XI. LAND USE AND PLANNING. Would the project:				
a) Physically divide an established community?	☐	☐	☐	☑
b) Cause a significant environmental impact due to a conflict with any land use plan, policy, or regulation adopted for the purpose of avoiding or mitigating an environmental effect?	☐	☐	☐	☑

Environmental Setting

The land uses in the West Oakland area vary greatly and are described below.

- Land uses to the north include the Emeryville portion of the East Bay Bridge Shopping Center, which contains regional commercial, community commercial, and medium-density residential uses. Other residential, light industrial, office, commercial, and public uses are located further to the north in Emeryville, including at the Bay Street Shopping Center.

- Interstate 580 is located along the northern boundary of West Oakland. North of Interstate 580 is the Longfellow residential neighborhood, near MacArthur Boulevard and 40th Street in North Oakland.

- To the northeast is the MacArthur BART Station, within the median of State Route 24. This area includes the MacArthur Transit Village, which provides 624 high-density, multifamily housing units, retail space, and a BART parking garage.

- Interstate 980 is located along the eastern boundary of West Oakland. East of Interstate 980 are the Pill Hill and Uptown neighborhoods, Downtown Oakland, City Center, Old Oakland, and the 19th Street and 12th Street BART stations.

- To the southeast is the waterfront Jack London district with Jack London Square, Amtrak's Oakland Jack London Square Railroad Station, and the Oakland Ferry Terminal.

- The Port of Oakland lies southwest of West Oakland. Interstate 880, the Union Pacific Railroad, and the Burlington Northern and Santa Fe (BNSF) Railroad are located along the southern and western boundary of West Oakland. The Union Pacific Intermodal Yard lies south of Interstate 880, within the Port. Port shipping terminals line the Oakland Estuary/Inner Harbor Channel further south and the Outer Harbor Channel to the west. The BNSF Intermodal Yard and Middle Harbor Park are to the southwest.

- Interstate 880 is located near the western boundary of the Planning Area. The Union Pacific Railroad and the BNSF Railroad, and the Knight Rail Yard are located underneath and immediately west of Interstate 880. The former Oakland Army Base (OARB), and former OARB Redevelopment Area, lies west of Interstate 880. The Oakland Base Reuse Authority currently leases space for various transportation, industrial and commercial uses until the former Army Base is redeveloped for permanent non-military uses.

- Land uses in West Oakland include the East Bay Municipal Utility District Main Wastewater Treatment Plant (MWWTP); the Interstates 80, 580, and 880 Interchange, known as the MacArthur Maze; and the Emeryville Crescent State Marine Reserve on the shore of San Francisco Bay. The newly constructed eastern single deck section of the Willie L. Brown Jr. San Francisco-Oakland Bay Bridge is the world's widest bridge. (Guinness World Records, 2014). The eastern terminus of that bridge, the bridge toll plaza, and the new maintenance yard lie further to the south, all within West Oakland. (City of Oakland, 2014).

Regulatory Background

Land uses are protected and regulated by the City of Oakland General Plan through land use and zoning requirements. The City of Oakland General Plan is comprised of the following 10 elements: Land Use and Transportation Element; Bicycle Master Plan; Pedestrian Master Plan; Estuary Policy Plan; Open Space, Conservation, and Recreation Element; Historic Preservation Element; Housing Element; Noise Element; Safety Element; and Scenic Highways Element.

Significance Criteria

Land use and planning impacts will be considered significant if the project conflicts with the land use and zoning designations established by the City of Oakland General Plan and the City of Oakland Specific Plan.

Discussion of Impacts

11. a) No Impact. West Oakland is currently subject to existing conditions that disrupt and divide the community. These conditions include the location of heavy industrial and transportation uses immediately adjacent to residential uses, and the separation of West Oakland from downtown Oakland, the waterfront at Jack London Square, Middle Harbor Park, and the rest of the City by freeways that surround the community.

Of the strategies that the District would implement, a number of them would apply to existing sources and could include replacing diesel engines, controlling emissions from existing facilities, and adding filtration systems to existing buildings. Other strategies would encourage the use of alternative fuels and zero emissions mobile sources (trucks, buses, locomotives), and provide shore power for ships. Implementation of these types of control measures would not be to physically divide the community, beyond the divisions that currently exist, as any new facilities would be expected to occur within the confines of the existing facilities. Therefore, the proposed project would not disrupt or divide the physical arrangement of the West Oakland community or any surrounding community.

11. b) No Impact. Of the strategies that the District would implement, a number of them would apply to existing sources and could include replacing diesel engines, controlling emissions from existing facilities, and adding filtration systems to existing buildings. Other strategies would encourage the use of alternative fuels and zero emissions mobile sources (trucks, buses, locomotives), and provide shore power for ships. Implementation of these types of control measures would not be expected to require any changes to land use or result in development that could conflict with a land use plan, policy, or regulation. Therefore, no significant land use impacts would be expected from implementation of the Community Action Plan.

Conclusion

Based upon the above considerations, no significant adverse land use impacts are expected to occur due to implementation of the Community Action Plan strategies and therefore, will not be further evaluated in the Draft EIR.

	Potentially Significant Impact	Less Than Significant Impact With Mitigation Incorporated	Less Than Significant Impact	No Impact
XII. MINERAL RESOURCES. Would the project:				
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?	☐	☐	☐	☑
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?	☐	☐	☐	☑

Environmental Setting

According to the California Department of Conservation Division of Mines and Geology's Aggregate Resources Map, West Oakland is not currently considered an Aggregate Resource sector. The Leona Quarry was the last mine in Oakland to be identified as a regionally significant source of aggregate resources. Areas with this designation are judged to be of prime importance in meeting future mineral needs in the region, and land use decisions must consider the importance of these resources to the region as a whole. The Leona Quarry has been closed for many years and there is no other land in Oakland with such a designation (City of Oakland, 2014).

Regulatory Background

Mineral resources are generally protected and regulated by the City and/or County General Plans through land use and zoning requirements, as well as to some extent by federal and state laws.

Significance Criteria

The proposed project impacts on mineral resources will be considered significant if:

- The project 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.
- The proposed project results 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.

Discussion of Impacts

12. a) and b) No Impact. No known mineral resources are located within West Oakland and the area is not designated as a locally important mineral resource recovery site under the City of Oakland General Plan Land Use and Transportation Element or Open Space, Conservation and Recreation Element. Therefore, no impacts on mineral resources are expected due to implementation of the West Oakland Community Action Plan.

Conclusion

Based upon the above considerations, no mineral resource impacts are expected to occur due to implementation of the Community Action Plan strategies, and therefore, will not be further evaluated in the Draft EIR.

	Potentially Significant Impact	Less Than Significant Impact With Mitigation Incorporated	Less Than Significant Impact	No Impact
XIII. NOISE. Would the project result in:				
a) Generation of a substantial temporary or permanent increase in ambient noise levels in the vicinity of the project in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?	☐	☐	☑	☐
b) Generation of excessive groundborne vibration or groundborne noise levels?	☐	☐	☑	☐
c) For a project located within the vicinity of a private airstrip or 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?	☐	☐	☐	☑

Environmental Setting

Transportation sources such as automobiles, trucks, and trains are the principal sources of noise in West Oakland. The primary noise sources are traffic on Interstates 580, 880, and 980, and on local arterial streets including Mandela Parkway, 14th Street, West Grand Avenue, 7th Street Adeline Street, Peralta Street, Hollis Street, San Pablo Avenue, Market Street, 27th Street, and Martin Luther King Jr. Way. The elevated BART line is a major noise source affecting the southern portion of West Oakland.

The Union Pacific Railroad and BNSF Railroad and their associated railyards and Port of Oakland intermodal facilities that border West Oakland on the south and west are major noise sources affecting those immediate areas.

Industrial and commercial equipment and operations also contribute to the ambient noise environment in West Oakland. Other sources of noise include traffic helicopters in the morning reporting on freeway traffic, ships passing by on their way to or from the Port of Oakland, the 5th biggest container port in the US and the 3rd biggest on the West Coast, and police helicopters at night.

Typical examples of transient noise sources in urban areas include car horns, car alarms, loud vehicles or motorcycles, emergency sirens, loud music, mechanical equipment, lawn mowers, trucks, and people talking. Many of these transient sources are common in urban areas. Although some of these transient sources may be annoying, they do not contribute substantially to the overall ambient noise level in any particular area (City of Oakland, 2014).

There have been number of efforts to mitigate traffic noise impacts in West Oakland, in particular noise from trucks associated with the Port of Oakland. While signs direct trucks to prescribed truck routes, trucks often deviate from these routes and trucks have been detected in mixed industrial/residential areas of West Oakland. Sound walls have been constructed along portions of Interstate 880 adjacent to the Prescott and South Prescott neighborhoods (City of Oakland, 2014).

A number of noise studies have been performed to measure noise levels in the West Oakland area. In general, the noise levels measured for the 2003 West Oakland Redevelopment Plan EIR are comparable to other, more recent noise measurements taken within West Oakland and at other BART station locations with similar locations and exposure circumstances. The conclusions that can be reached from all of these noise studies indicate that:

- Noise levels are generally highest along the elevated sections of the Interstate 580 and 880 freeways, with community noise exposure levels (CNELs) estimated at 68 to 71 decibels at 400 feet from both freeway centerlines; freeway noise levels are lower in areas protected by sound walls (less than 60 decibels at 400 feet from the Interstate 880 freeway centerline).

- Noise levels reach in excess of 67 decibels during the day in the southeastern portion of the West Oakland BART station south parking lot. Noise levels at the northern edge of the BART station on 7th Street reach in excess of 68 decibels during the day.

- Along major arterial streets such as Mandela Parkway, San Pablo Avenue, 7th Street, and West Grand Avenue daytime noise levels are mostly between 66 to 68 decibels and CNEL levels were mostly between 68 and 72 decibels at 50 feet from roadway centerlines.

- In areas away from arterials, freeways, and BART (where there are no adjacent major noise sources), noise levels are generally less than 65 decibels CNEL.

When measured noise levels are compared to City noise and land use compatibility guidelines, they indicate that the existing noise environments near the elevated segments of Interstates 580 and 880 (unprotected by sound walls) and near the elevated BART tracks and West Oakland BART station are generally incompatible with residential and other noise-sensitive land uses. Noise levels along many major arterial streets generally meet the threshold for conditionally acceptable noise levels for residential uses (City of Oakland, 2014).

Regulatory Background

Noise issues related to construction and operation activities are addressed in the City of Oakland General Plan including the Land Use and Transportation Element and Noise Element. The Noise Element identifies noise and land use compatibility standards for various land uses, derived from the California Department of Health Services noise compatibility guidelines. The following are the maximum interior noise levels generally considered acceptable for various common land uses:

- 45 decibels: residential, hotels, motels, transient lodging, institutional (churches, hospitals, classrooms, libraries), movie theaters.
- 50 decibels: professional offices, research and development, auditoria, meeting halls.
- 55 decibels: retail, banks, restaurants, sports clubs.
- 65 decibels: manufacturing, warehousing (City of Oakland, 2014).

The City of Oakland has a noise ordinance that prohibits persistent, excessive and annoying noise between 9:00 p.m. and 7:00 a.m. Oakland Municipal Code §§ 8.18.010–8.18.020.[13]

City of Oakland Planning Code § 17.120.050 also regulates noise in the City of Oakland with several maximum allowable receiving noise level standards variously applying 24 hours a day.[14]

Significance Criteria

The proposed project impacts on noise will be considered significant if:

- Construction noise levels exceed the local noise ordinances or, if the noise ordinance is currently exceeded, project noise sources increase ambient noise levels by more than three decibels (dBA) at the site boundary.
- The proposed project operational noise levels exceed any of the local noise ordinances at the site boundary or, if the noise threshold is currently exceeded, project noise sources increase ambient noise levels by more than three decibels at the site boundary.

[13] See Oakland Noise Ordinance, Oakland Municipal Code §§ 8.18.010–8.18.020, at: https://library.municode.com/ca/oakland/codes/code_of_ordinances?nodeId=TIT8HESA_CH8.18NU_8.18.010EXANNOPR .

[14] See Oakland Noise Performance Standards, Oakland Planning Code § 17.120.050, at http://oakland-ca.elaws.us/code/plco_title17_ch17.120_sec17.120.050.

- The proposed project is in the vicinity of a private airstrip or airport land use plan and exposes people residing or working in the project area to excessive noise levels.
- Construction results in the generation of excessive groundborne vibration or groundborne noise levels

Discussion of Impacts

Noise Descriptors

Noise is a by-product of urbanization and there are numerous noise sources and receptors in an urban community. Noise is generally defined as unwanted sound. The range of sound pressure perceived as sound is extremely large. The decibel is the preferred unit for measuring sound since it accounts for these variations using a relative scale adjusted to the human range for hearing (referred to as the A-weighted decibel or dBA). The A-weighted decibel is a method of sound measurement that assigns weighted values to selected frequency bands in an attempt to reflect how the human ear responds to sound. The range of human hearing is from 0 decibels (the threshold of hearing) to about 140 decibels which is the threshold for pain.

In addition to the actual instantaneous measurements of sound levels, the duration of sound is important since sounds that occur over a long period of time are more likely to be an annoyance or cause direct physical damage or environmental stress. To analyze the overall noise levels in an area, noise events are combined for an instantaneous value or averaged over a specific time period. The time-weighted measurement is referred to as equivalent sound level and represented by energy equivalent sound level (Leq). The percentage of time that a given sound level is exceeded also can be designated as L_{10}, L_{50}, L_{90}, etc. The subscript notes the percentage of time that the noise level was exceeded during the measurement period. Namely, an L_{10} indicates the sound level is exceeded 10 percent of the time and is generally taken to be indicative of the highest noise levels experienced at the site. The L_{90} is that level exceeded 90 percent of the time and this level is often called the base level of noise at a location. The L_{50} sound (that level exceeded 50 percent of the time) is frequently used in noise standards and ordinances.

Environmental noise is measured on a logarithmic scale in decibels (dB). Decibels measure the relative magnitude of pressure fluctuations in a sound medium under the influence of a vibratory source. An increase of 10 decibels represents a 10-fold increase in acoustic energy, which is perceived by people as approximately a doubling of loudness over a wide range of amplitudes. Since decibels are logarithmic units, sound pressure levels are not added arithmetically. When two sounds of equal sound pressure level are added, the result is a sound pressure level that is three dB higher. For example, 60 dB plus 60 dB equals 63 dB. However, where noise levels differ, there may be little change in comparison to the louder noise source; for example, when 70 dB and 60 dB sources are added, the resulting noise level equals 70.4 dB. In general, a three to five decibels change in community noise levels starts to become noticeable, while one to two decibels changes are generally not perceived.

Because the human hearing system is not equally sensitive to sound at all frequencies, the A-weighted filter system is used to express measured sound levels, in units of decibels, based on the sensitivity of the human ear. The decibels scale emphasizes mid- to high-range frequencies and de-emphasizes the low frequencies to which human hearing is less sensitive. Because A-weighted sound levels are adjusted to the sensitivity of the human ear, they are commonly used to quantify noise events and environmental noise. However, community response also depends on the existing ambient sound level, magnitude of sound with respect to the background noise level, duration of the sound, repetitiveness, number of events, and time of day.

13. a) Less Than Significant.

Construction Noise Impacts

Of the strategies that the District would implement, a number of them would apply to existing sources and could include replacing diesel engines, controlling emissions from existing breweries or wineries, and adding filtration systems to existing buildings. Other strategies would encourage the use of alternative fuels and zero emissions mobile sources (trucks, buses, locomotives), and provide shore power for ships. Implementation of these types of control measures may require construction activities at existing facilities. Table 2-3 presents typical noise levels associated with construction equipment.

TABLE 2-3

Construction Equipment Noise Levels

Equipment	Typical Noise Level 50 ft from Source (dBA)
Air Compressor	81
Backhoe	80
Ballast Equalizer	82
Ballast Tamper	83
Compactor	82
Concrete Mixer	85
Concrete Pump	82
Concrete Vibrator	76
Crane, Derrick	88
Crane, Mobile	83
Dozer	85
Generator	81
Grader	85
Impact Wrench	85
Jack Hammer	88
Loader	85

Paver	89
Pile-driver (Impact)	101
Pile-driver (Sonic)	96
Pneumatic Tool	85
Pump	76
Rail Saw	90
Rock Drill	98
Roller	74
Saw	76
Scarifier	83
Scraper	89
Shovel	82
Spike Driver	77
Tie Cutter	84
Tie Handler	80
Tie Inserter	85
Truck	88

Source: U.S. FTA, 2018.

Specific projects have not been identified so that the actual construction equipment that would be used is unknown. However, noise associated with construction activities would diminish rapidly with distance from a constructive site, generally at a rate of six decibels per doubling of distance. For example, a noise level of 86 decibels measures at 50 feet from the noise source would decrease to 80 decibels at 100 feet, and 74 decibels at 200 feet.

The City of Oakland limits construction activities to between 7:00 am and 7:00 pm Monday through Friday, except that pile driving and other extreme noise generating activities greater than 90 decibels are limited to between 8:00 am and 4:00 pm Monday through Friday. Compliance with the City's noise requirements would limit noise activities to daytime hours during weekdays and avoid construction during the more sensitive nighttime hours. Further construction activities are expected to be limited to industrial areas and would be temporary. Therefore, noise impacts associated with construction activities are expected to be less than significant.

Operational Noise Impacts

Of the strategies that the District would implement, a number of them would apply to existing sources and could include replacing diesel engines, controlling emissions from existing facilities, and adding filtration systems to existing buildings. Other strategies would encourage the use of alternative fuels and zero emissions mobile sources (trucks, buses, locomotives), and provide shore power for ships. Implementation of strategies such as replacing diesel engines, adding filtration systems to existing buildings and use of zero emission sources would not be expected to result in operational noise increases as no new noise sources would be required.

Producing alternative fuels and additional electricity could result in additional noise sources at refineries and electricity producing facilities. Also, the use of a bonnet system on ships could require the operation of additional control equipment. While these activities could result in an increase in noise sources, they are located in industrial areas where allowable noise levels generally are higher. Residential and sensitive land uses are typically located a sufficient distance from these industrial areas that significant noise impacts would not be expected to occur. The Port is in West Oakland and served by Interstate 880, which is a dominate noise source in West Oakland.

In addition, the City of Oakland requires that noise levels from any activity, property or mechanical equipment comply with performance standards of Section 17.120 of the Oakland Planning Code and Section 8.18 of the Oakland Municipal Code.[15] Under these Code provisions, the maximum allowable receiving noise recognizes varying degrees of sensitivity associated with different land uses. Section 17.120 sets forth different and more stringent maximum allowable noise levels for residential and civic uses (such as parks/open space areas than for commercial or industrial uses deemed to have lower noise sensitivity. Compliance with the City’s noise standards would limit noise impacts to less than significant.

13. b) Less Than Significant. The proposed project is not expected to generate or expose people to excessive groundborne vibration or groundborne noise. The use of large construction equipment that would generate substantial noise or vibration (e.g., backhoes, graders, jackhammers, etc.) would be limited because the sites are already graded and developed. Further, construction activities are temporary and would occur during the daylight hours, in compliance with local noise standards and ordinances. Therefore, the proposed project is not expected to generate excessive groundborne vibration or noise.

13. c) No Impact. West Oakland is not located within an airport land use plan area or within two miles of a public airport, public use airport, or near a private airstrip. The closest airport, Oakland International Airport, is over 6 miles southeast of West Oakland. The proposed project would not expose people residing or working in the project area to excessive noise levels associated with airports.

Conclusions

Based upon the above considerations, no significant noise impacts are expected to occur due to implementation of the Community Action Plan strategies and therefore, will not be further evaluated in the Draft EIR.

[15] For links to these code sections, see the immediately prior two footnotes just above.

	Potentially Significant Impact	Less Than Significant Impact with Mitigation Incorporated	Less Than Significant Impact	No Impact
XIV. POPULATION AND HOUSING. Would the project:				
a) Induce substantial unplanned 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)?	☐	☐	☐	☑
b) Displace a substantial number of existing people or housing units, necessitating the construction of replacement housing elsewhere?	☐	☐	☐	☑

Environmental Setting

The population of West Oakland grew from approximately 23,400 to 25,250 people between 1990 and 2011, an increase of 15 percent, which is faster than the overall growth rate for the City of Oakland of 11 percent. West Oakland has been a primarily African American community since the mid-20th Century. While African Americans are still the largest racial group, in recent decades the area has become more diverse with a growth in the Hispanic community. The number of households in West Oakland decreased from 8,683 to 8,431 between 1990 and 2011, in part due to the demolition and reconstruction of the Chestnut/Linden and Westwood Gardens public housing projects. The average household size in West Oakland increase between 1990 and 2011 from 2.67 to 2.90 persons per household and the percentage of households with children rose from 40 to 60 percent. In 2011, West Oakland had an estimated 10,444 housing units, of which 8,431 were occupied, leaving a 19.3 percent vacancy rate, while the vacancy rate in Oakland was 6.3 percent, substantially less than West Oakland (City of Oakland, 2014).

Regulatory Background

Population and housing growth and resources are generally protected and regulated by the City of Oakland General Plan, which includes a Housing Element adopted in December 2010. The Housing Element includes an assessment of housing needs; a statement of the community's goals, objectives, and policies related to housing; and a five-year schedule for actions to implement the goals and objectives. Population and housing may also be influenced by the Alameda County General Plan, though to a lesser extent than by the directly governing Oakland General Plan.

Significance Criteria

The proposed project impacts on population and housing will be considered significant if:

- The demand for temporary or permanent housing exceeds the existing supply.
- The proposed project produces additional population, housing or employment inconsistent with adopted plans either in terms of overall amount or location.
- The project displaces substantial numbers of people or existing housing, necessitating the construction of replacement housing elsewhere in excess of that contained in the City's Housing Element

Discussion of Impacts

14. a) No Impact. According to the Association of Bay Area Governments (ABAG), population in the Bay Area is currently about 7.6 million people and is expected to grow to about 9.6 million people by 2040 (ABAG, 2017). The proposed project is not anticipated to generate any significant effects, either directly or indirectly, on the Bay Area's population or population distribution. Of the strategies that the District would implement, a number of them would apply to existing sources and could include replacing diesel engines, controlling emissions from existing breweries or wineries, and adding filtration systems to existing buildings. Other strategies would encourage the use of alternative fuels and zero emissions mobile sources (trucks, buses, locomotives), and provide shore power or a bonnet system for ships.

The proposed project will require construction activities and temporary construction workers to modify existing operations and/or install air pollution control equipment at existing industrial facilities. In addition, it is not expected that the affected facilities would need to hire additional personnel to operate new air pollution control equipment at existing facilities or add filtration systems to existing buildings. It is expected that the existing labor pool would accommodate the labor requirements for the temporary construction workers, as the existing labor pool is over seven million people. As such, adopting the Community Action Plan is not expected to induce substantial population growth.

14. b). No Impact. Construction associated with the proposed project is expected to be limited to constructing new air pollution control equipment or facility modifications at existing facilities. All construction would take place at existing facilities. The implementation of the Community Action Plan is not expected to result in the creation of any industry/business 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 proposed project.

Conclusion

Based upon the above considerations, no significant population and housing impacts are expected to occur due to implementation of the Community Action Plan strategies and therefore, will not be further evaluated in the Draft EIR.

	Potentially Significant Impact	Less Than Significant Impact With Mitigation Incorporated	Less Than Significant Impact	No Impact
XV. PUBLIC SERVICES. Would the project:				
a. Would the project result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, 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?				
Police protection?	☐	☐	☐	☑
Schools?	☐	☐	☐	☑
Parks?	☐	☐	☐	☑
Other public facilities?	☐	☐	☐	☑

Environmental Setting

Fire Protection

The Oakland Fire Department provides fire protection (prevention and suppression), and local emergency response (rescue, hazardous materials response, and first responder emergency medical services) services to West Oakland. The Alameda County Medical Services District contracts with American Medical Response Ambulance Company and Oakland Fire Department to respond to medical emergencies. In addition to firefighting and emergency medical response capabilities, the Oakland Fire Department also has a Hazardous Materials Unit that operates from Station 3 in West Oakland and responds citywide to emergencies involving hazardous materials. The Oakland Fire Department is a part of the State of California Master Mutual Aid Agreement where Oakland Fire Department provides mutual aid to other cities and communities throughout the state, and vice versa.

The Oakland Fire Department operates 25 fire stations. There are two fire stations within West Oakland.[16] Fire Station 3, located at 1445 14th Street at Mandela Parkway. Station 3 is staffed daily by eight firefighters, two of which are paramedics and the remaining

[16] City of Oakland https://www.oaklandca.gov/topics/fire-stations

emergency response technicians (EMT). Station 3 has an engine and truck for fire suppression, and houses Oakland Fire Department's primary hazardous materials incident response team. Fire Station 5 is located at 934 34th Street at San Pablo Avenue. Station 5 is staffed daily by four fire fighters (one paramedic and three EMTs) and has one engine. In addition, Station 1 and Station 15 are located just outside West Oakland at 1605 Martin Luther King Way, and at 455 27th Street, respectively. Station 1 is staffed daily with nine firefighters (two paramedics and seven EMTs) and has one engine and one truck. The Oakland Fire Department's response time goal is seven minutes, 90 percent of the time. The Oakland Fire Department's average citywide response time is seven minutes, 86 percent of the time (City of Oakland, 2014).

Police Protection

The Oakland Police Department provides police services throughout the city. The Port of Oakland obtains City services, including police protection, through annual payments to the City. The Port also provides private security at its truck parking facility.

The Oakland Police Department is headquartered at 455 7th Street in Downtown Oakland. The Oakland Police Department also operates from the Eastmont Substation at 73rd and Bancroft Avenues.

The Oakland Police Department has approximately 660 sworn police officers, approximately 297 support staff, and 10 reserve officers. The Oakland Police Department has geographically divided the City into three command areas, 57 community policing beats and 35 patrol beats. The beats located within West Oakland are 02X, 02Y, 05X, 05Y, 06X and 07X. Neighborhood service coordinators are civilian employees who serve as a liaison between the community and the Police Department, and work with residents, businesses, schools, and other institutions to set priorities and develop strategies to improve public safety and reduce crime. Each neighborhood service coordinator handles multiple patrol beats (City of Oakland, 2014).

Police response times to calls for police services are recorded for the city as a whole; the Oakland Police Department does not track response times for individual service areas. In 2011, citywide average response times for Priority 1, 2, and 3 calls were 10.4 minutes, 22.8 minutes, and 23.5 minutes, respectively. These response times did not meet City goals (City of Oakland, 2014).

West Oakland has historically had high crime rates, both violent crimes against persons and property crimes. West Oakland had a much higher murder rate, almost four times higher than the city's and 16 times higher than the state in 2010. Rates of robbery and aggravated assault, the most common violent crimes, were twice as high in West Oakland in 2010 than in the City of Oakland, and between six and eight times higher than the state. For property crimes (burglary, larceny, vehicle theft, and arson), West Oakland had a rate in 2010 more than 20 percent higher than the city's and 1.5 times higher than the state (City of Oakland, 2014).

Schools

The Oakland Unified School District operates the public-school system in the City of Oakland. The Oakland Unified School District administers 77 elementary schools, 19 middle schools, one junior high school, 31 high schools, and two K-12 schools. It is also responsible for three alternative schools, two special education schools, three continuation schools, three community day schools, and one opportunity schools. The District's overall enrollment peaked in 1999 at 55,000, dropped to 39,000 by 2007, and is continuing to decline. Declining enrollment is projected to continue (City of Oakland 2014).

The Oakland Unified School District divides the city into three regional zones to manage resources. West Oakland is located within Region 1. There are 22 elementary schools, seven middle schools and one K-8 school within Region 1. Oakland Unified School District has four elementary schools, two middle schools and one high school in West Oakland including the following:

- McClymonds High School at 2607 Myrtle Street has approximately 383 students in the 2018-2019 school year[17]. McClymonds is a highly valued resource in West Oakland since it is the only full-sized public high school in Region 1.

- Ralph Bunche Middle School at 1240 18th Street has approximately 124 students in the 2018-2019 school year.

- Lowell Middle School at 991 14th Street has approximately 199 students in the 2018-2019 school year and houses the West Oakland Middle School and Kipp Bridge Academy, a charter school.

- Hoover Elementary School at 890 Brockhurst Street has approximately 269 students in the 2018-2019 school year.

- Lafayette Elementary School at 1700 Market Street has approximately 83 students in the 2018-2019 school year.

- Martin Luther King, Jr. Elementary School at 960 10th Street has approximately 314 students in the 2018-2019 school year.

- Prescott Elementary School at 920 Campbell Street, now known as Preparatory Literary Academy of Cultural Excellence (PLACE) @ Prescott, has 151 students during the 2018-2019 school year.

Oakland Unified School District charter schools in West Oakland include: Oakland Charter High School (Grades 9-12) located at 345 12th Street (235 students in 2018-2019), KIPP

[17] California Department of Education, Dataquest system; Available at https://dq.cde.ca.gov/dataquest/page2.asp?level=School&subject=Enrollment&submit1=Submit

Bridge Charter Academy, a charter school (Grades 5-8) located at 991 14th Street (528 students in 2018-2019), Oakland School of the Arts (Grades 6-8) located at 530 18th Street (749 students in 2018-2019), and the American Indian Public Charter School II (Grades 6-8) located at 171 12th Street (161 students in 2018-2019).

Parks

The City of Oakland General Plan establishes a parkland standard of four acres per 1,000 residents (for parks that meet the active recreational needs of the community as opposed to passive recreational open space). Oakland provides 1.33 acres of local serving park acreage per 1,000 residents, which falls short of the General Plan parkland standard.

According to the City of Oakland General Plan Open Space, Conservation and Recreation (OSCAR) Element[18], West Oakland has 56.70 acres of parkland, including schoolyards and athletic fields, which equates to 2.43 acres of parkland per 1,000 residents, or 60 percent of the General Plan parkland standard. Despite this deficiency, West Oakland has more parkland than any other flatland neighborhood in Oakland.

Regulatory Background

The Oakland City General Plan establishes goals and policies to assure adequate public services are maintained within the local jurisdiction.

Significance Criteria

Impacts on public services will be considered significant if the project results in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, or the need for new or physically altered government facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response time or other performance objectives.

Discussion of Impacts

15. a) No Impact. Implementation of the Community Action Plan 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. The facilities affected by the proposed project are existing facilities for which public services are already required and no increase in the need for such services is expected. Further, a number of industrial facilities have existing security and fire-fighting capabilities, e.g., port facilities, and are able to respond to fire and security issues independent of public police and fire services. There will be no increase in population as a result of the implementation of the Community Action Plan and, therefore, no need for physically altered government facilities.

[18] The City of Oakland General Plan Open Space, Conservation and Recreation (OSCAR) Element is accessible at: http://www2.oaklandnet.com/government/o/PBN/OurServices/GeneralPlan/DOWD009017 .

As noted in the "Population and Housing" discussion above, the proposed project is not expected to induce population growth because the existing local labor pool (e.g., workforce) is sufficient to accommodate the expected temporary construction work force. No increase in permanent workers is expected to be required to operate the equipment that may be installed at affected facilities. Therefore, there will be no increase in local population and thus no impacts are expected to local schools or parks.

Conclusion

Based upon the above considerations, no significant population and housing impacts are expected to occur due to implementation of the Community Action Plan strategies and therefore, will not be further evaluated in the Draft EIR.

	Potentially Significant Impact	Less Than Significant Impact With Mitigation Incorporated	Less Than Significant Impact	No Impact
XVI. RECREATION. Would the project:				
a) 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?	☐	☐	☐	☑
b) Include recreational facilities or require the construction or expansion of recreational facilities that might have an adverse physical effect on the environment?	☐	☐	☐	☑

Environmental Setting

Parks and recreation services within the City of Oakland are provided by the City of Oakland Department of Parks, Recreation & Youth Development, and the East Bay Regional Park District (EBRPD). Oakland Parks and Recreation manages the City's parks and recreation centers. The EBRPD, although responsible primarily for acquiring and developing regional parks, open spaces, and regional trails throughout the East Bay, also provides open space and recreational facilities within Oakland's city limits.

Oakland Parks and Recreation parks in West Oakland include Brush Street, Bertha Port, Crescent, Cypress Freeway Memorial, DeFremery, Durant, Fitzgerald, Grove Shafter, Lowell, Marston Campbell, McClymonds, Poplar, Raimondi, South Prescott, Saint Andrews Plaza, Union Plaza, Wade Johnson, Willow Street, Wood Street Pocket Park, and 25th Street. Other nearby parks outside the area also serve West Oakland residents, including Middle Harbor Park and Portview Park in the Port of Oakland.

Oakland Parks and Recreation also operates several community recreation centers that offer sports, arts and crafts, culture arts and dance, computer labs, drama, mentoring, general learning, and afterschool activities. Recreation centers in West Oakland include DeFremery Recreation Center, West Oakland Senior Center, and Willie Keyes Community Center.

The City of Oakland General Plan establishes a parkland standard of four acres per 1,000 residents (for parks that meet the active recreational needs of the community as opposed to passive recreational open space). Oakland provides 1.33 acres of local serving park acreage per 1,000 residents, which falls short of the General Plan parkland standard.

According to the City of Oakland General Plan Open Space, Conservation and Recreation (OSCAR) Element, West Oakland has 56.70 acres of parkland, including schoolyards and athletic fields, which equates to 2.43 acres of parkland per 1,000 residents, or 60 percent of the General Plan parkland standard. Despite this deficiency, West Oakland has more parkland than any other flatland neighborhood in Oakland (City of Oakland, 2014).

The creation of the new Gateway Park is proposed at the foot of the east span of the San Francisco-Oakland Bay Bridge (Bay Bridge) in West Oakland. The project would provide safe access to the bicycle/pedestrian path on the east span of the Bay Bridge, as well as access to existing and planned segments of the regional San Francisco Bay Trail. The new park would include recreation opportunities and features to showcase the natural, maritime, industrial, and transportation history of the East Bay. The project would also provide safe, multimodal access to the shoreline and could be a unique waterfront amenity. Furthermore, it would be designed to meet mitigation commitments for the Bay Bridge East Span Seismic Safety Project, reuse of the Oakland Army Base, and demolition and reconstruction of I-880. Outside the park boundaries, the project could also include installing landscaping near I-880.[19]

Due to funding constraints and the varying timelines for the availability of different sections of land, Gateway Park likely will be developed in phases. Portions will open to the public as they are completed, with remaining segments constructed as funding allows and as land becomes available. The project could include private sector and philanthropic participation.[20]

Regulatory Background

Recreational areas are protected and regulated by the City of Oakland's Open Space, Conservation and Recreation Element of the General Plan and through land use and zoning requirements. Some parks and recreation areas are designated and protected by state and federal regulations.

Significance Criteria

The proposed project impacts on recreation will be considered significant if:

- The project results in an increased demand for neighborhood or regional parks or other recreational facilities.
- The project adversely affects existing recreational opportunities.

(1) [19]State Clearinghouse (https://ceqanet.opr.ca.gov/2013112003/2)

(2) [20] Metropolitan Transportation Commission (https://mtc.ca.gov/our-work/plans-projects/recreation-open-space/gateway-park)

Discussion of Impacts

16. a and b) No Impact. As discussed under "Land Use" above, there are no provisions in the Community Action Plan 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 the control strategies that the District would implement. Of the strategies that the District would implement, a number of them would apply to existing sources and could include replacing diesel engines, controlling emissions from existing breweries or wineries, and adding filtration systems to existing buildings. Other strategies would encourage the use of alternative fuels and zero emissions mobile sources (trucks, buses, locomotives), and provide shore power for ships. Implementation of these types of control measures would occur within existing developed facilities and would not impact recreational facilities. Further, no increase in permanent workers is expected at the affected facilities; thus, there would be no increase in population that would result in more frequent use of recreational facilities.

Conclusion

Based upon the above considerations, no significant impacts on recreation facilities are expected to occur due to implementation of the Community Action Plan strategies and therefore, will not be further evaluated in the Draft EIR.

		Potentially Significant Impact	Less Than Significant Impact With Mitigation Incorporated	Less Than Significant Impact	No Impact
XVII.	**TRANSPORTATION.** Would the project:				
a)	Conflict with a program, plan, ordinance or policy addressing the circulation system, including transit, roadway, bicycle and pedestrian facilities?	☐	☐	☑	☐
b)	Would the project conflict or be inconsistent with CEQA Guidelines § 15064.3 subdivision(b)?	☐	☐	☑	☐
c)	Substantially increase hazards due to a geometric design feature (e.g. sharp curves or dangerous intersections) or incompatible uses (e.g. farm equipment)?	☐	☐	☐	☑
d)	Result in inadequate emergency access?	☐	☐	☐	☑

Environmental Setting

West Oakland is a major regional transportation hub for the greater Bay Area. Regional vehicular access to and within West Oakland is provided by a freeway system that includes Interstate 80, Interstate 580, Interstate 880, Interstate 980, and State Route 24. These freeways, all five of which run through West Oakland, and other key roadways in West Oakland are described below and summarized in the West Oakland Specific Plan (City of Oakland, 2014). The Port of Oakland, which is in West Oakland, is the nation's 5th and the West Coast's 3rd biggest container port.

Interstate 80 is a major transcontinental freeway spanning between California and New Jersey. In the Bay Area, it serves San Francisco and East Bay destinations in Alameda, Contra Costa and Solano counties. Interstate 80 is connected to West Oakland by freeway ramps that terminate at the West Grand Avenue/Interstate 880 Frontage Road intersection. Interstate 80 carries approximately 242,000 vehicles daily to San Francisco.

Interstate 580 is a major east-west freeway connecting the Bay Area and the Central Valley. From West Oakland, the freeway extends northwest to U.S. 101 to San Rafael in Marin County via a joint segment with Interstate 80 between Emeryville and Richmond. It also extends southeast to Interstate 5 in San Joaquin County south of Tracy through Bay Area cities such as San Leandro, Pleasanton, and Livermore. Access to/from the West Oakland is provided via the West Grand

Avenue/Interstate 80 ramps, West Street/San Pablo Avenue ramps, and Interstate 980. Interstate 580 carries approximately 118,000 vehicles daily in the vicinity of West Oakland.

Interstate 880 serves west Alameda County and Santa Clara County connecting Interstate 80 in Oakland to Interstate 280 in San Jose through cities such as Hayward, Fremont, and Milpitas. In San Jose, it continues as State Route 17 south of the Interstate 280 junction. Access to/from West Oakland is provided by ramps at 5th, 6th, and 7th Streets. Interstate 880 connects to west Interstate 80 at the Bay Bridge Toll Plaza. Interchange ramps connect Interstate 880 to Union, Adeline, and Market Streets. A connection to Interstate 80 east is provided at the north end of Frontage Road. Interstate 880 carries approximately 123,000 vehicles daily west of the 7th Street junction.

Interstate 980 runs between Interstate 580 and Interstate 880 to the immediate east of West Oakland. North of Interstate 580, it continues as State Route 24 to Contra Costa County via the Caldecott Tunnel. Interstate 980 carries approximately 113,000 vehicles daily just south of Interstate 580.

State Route 24 is an eight-lane freeway that connects the East Bay area with central and east Contra Costa County. State Route 24 extends from Interstate 980 to Interstate 680 through the Caldecott tunnel and carries approximately 150,000 vehicles daily just west of the Caldecott Tunnel.

7th Street is a four-lane east-west roadway between Parkview Park to the west and Fallon Street in downtown Oakland to the east. East of Fallon Street, it continues as 8th Street. 7th Street operates in a one-way eastbound direction east of Martin Luther King Jr. Way and serves local and cross-town traffic for West Oakland traffic. It also provides freeway access to Interstate 880 south.

West Grand Avenue provides access to Interstate 80 to/from the West Oakland area. It spans between the Interstate 80 Junction/Maritime Street and Broadway in downtown Oakland, where it continues as Grand Avenue eastward. West Grand Avenue has two travel lanes in each direction with the exception of the segment between Mandela Parkway and market Street, which has three lanes per direction.

Frontage Road extends between West Grand Avenue and 7th Street along Interstate 880 and serves as the western boundary of West Oakland. The four-lane, north-south roadway provides access from West Oakland to/from Interstate 80 and Interstate 880.

Mandela Parkway spans between 3rd Street and Hollis Street providing access to Emeryville to the north. It has two travel lanes in each direction between 7th Street and Hollis Street and one lane per direction south of 7th Street. Between 8th and 32nd Streets, a landscaped linear park serves as a wide median island along Mandela Parkway.

Adeline Avenue extends from Shattuck Avenue in Berkeley south through the middle of West Oakland to continue as Middle Harbor road south of 3rd Street. In West Oakland, Adeline Avenue has two travel lanes in each direction.

Market Street is a north-south roadway that spans between Alcatraz Avenue in Berkeley and just south of 1st Street in the Port of Oakland. Landscaped median is provided south of 19th Street and painted median is provided along most of the roadway north of Mead Avenue (City of Oakland, 2014).

A Level of Service analysis completed at major intersections in West Oakland indicated under weekday morning and evening peak hours, all intersections currently operate at acceptable levels of service during peak hours (level of service D or better) (City of Oakland, 2014).

Transit service is provided by the Alameda-Contra Costa Transit district (AC Transit) and BART. AC Transit provides an extensive network of fixed route bus services in Alameda and Contra Costa counties. It also offers Transbay service to destinations in San Francisco, San Mateo and north Santa Clara counties. AC Transit service is comprised of 10 transit routes throughout West Oakland.

Regulatory Background

Transportation planning is usually conducted at the state and county level. California Department of Transportation Caltrans (District 4) has jurisdiction over and constructs and maintains state highways. Caltrans District 4 serves Alameda, Contra Costa, Marin, Napa, San Francisco, San Mateo, San Francisco, Santa Clara, Solano, and Sonoma counties.

The Metropolitan Transportation Commission (MTC) is the state designated metropolitan planning organization for the nine-county San Francisco Bay Area; it has authority for regional planning, distributing and administering federal and state funds for all modes of transportation, and assuring that projects are consistent with the Regional Transportation Plan.

MTC updated its Regional Transportation Plan in 2017. The Plan Bay Area 2040 forecasts transportation needs through 2040, while providing more housing and transportation choices and reducing pollution caused by transportation.

The Alameda County Transportation Commission (Alameda CTC) coordinates transportation planning efforts through Alameda County and allocates local, regional, state and federal funding for projects Alameda CTC develops a Countywide Transportation Plan, a long-range policy document that guides transportation funding decisions. The Alameda CTC also acts as the Congestion Management Agency for Alameda County which is mandated to develop a Congestion Management Program. The City of Oakland is the primary local agency for transportation in the West Oakland area. The Oakland

General Plan outlines the goals for future sustainable growth and the City of Oakland Municipal codes enforce the rules and regulations.

The Port of Oakland is governed by a Board of 7 Port Commissioners under the City of Oakland Charter.

Significance Criteria

The proposed project impacts on transportation and traffic will be considered significant if:

- The project would conflict with a program, plan, ordinance, or policy addressing the circulation system
- The project conflicts with project conflict or be inconsistent with CEQA Guidelines § 15064.3 subdivision(b).
- There is an increase in traffic that is substantial in relation to the existing traffic load and capacity of the street system.
- The demand for parking facilities is substantially increased.
- Water borne, rail car or air traffic is substantially altered.
- Traffic hazards to motor vehicles, bicyclists or pedestrians are substantially increased due to geometric design features or incompatible uses.
- The project would result in inadequate emergency access.

Discussion of Impacts

17. a and b) Less Than Significant. Of the strategies that the District would implement as part of the Community Action Plan, a number of them would apply to existing sources and could include replacing diesel engines, move truck related businesses to other locations, enforce truck routes, create transit, bike, pedestrian improvements, controlling emissions from existing facilities, and adding filtration systems to existing buildings. Other strategies would encourage the use of alternative fuels and zero emissions mobile sources (trucks, buses, locomotives), and provide shore power or bonnet systems for ships at or near the Port of Oakland. Implementation of strategies such as replacing diesel engines, adding filtration systems to existing buildings, the use of zero emission sources, producing alternative fuels and generating additional electricity would not be expected to result in a substantial increase in traffic. Additional trucks would be required to deliver new equipment, e.g., new diesel engines or new air pollution control equipment. This would be a one-time delivery of equipment with no increase in peak hour truck traffic. Temporary construction workers would be required to install new equipment (e.g., air pollution control equipment, filtration systems, bonnet system, etc.). However, construction activities are not expected to be extensive or require a substantial increase in workers or related traffic. Further, construction workers would be temporary, and the traffic would cease once construction activities are complete.

Following construction activities, the control strategies would not be expected to generate a substantial increase in traffic, either workers or trucks. As discussed in XIV - Population and Housing, it is not expected that the affected facilities would need to hire additional personnel to operate new air pollution control equipment at existing facilities or add filtration systems to existing buildings, so no increase in permanent worker traffic would be expected. On an operational basis, trucks may be required to deliver supplies on an occasional basis. For example, the use of a Selective Catalytic Reduction unit to control NOx emission as part as the bonnet system for control of ship emissions would require delivery of ammonia or urea on a regular basis. The frequency of truck trips would depend on the SCR system installed and the size of the ammonia storage equipment but would be expected to require 1-2 trucks per week. An increase of a few trucks per week would not result in any substantial increase in traffic in the Oakland area, and would not result in a conflict with a program, plan, ordinance or policy addressing the circulation system, including transit, roadway, bicycle and pedestrian facilities.

17. c and d) No Impact. The proposed project would not increase traffic hazards or create incompatible uses. The proposed project 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. Since changes to the roadway system are not expected, no impacts on emergency access would be expected. Emergency access at industrial facilities affected by the proposed project is not expected to be impacted, as no modifications that effect traffic or access are expected to be required. The proposed project is not expected to increase vehicle trips or to alter the existing long-term circulation patterns, thus creating traffic hazards or impacting emergency access.

Conclusion

Based upon the above considerations, transportation impacts may potentially occur due to the implementation of the Community Action Plan strategies, and will be further evaluated in the Draft EIR

	Potentially Significant Impact	Less Than Significant Impact With Mitigation Incorporated	Less Than Significant Impact	No Impact
XVIII. TRIBAL CULTURAL RESOURCES.				
a) Would the project cause a substantial adverse change in the significance of a tribal cultural resource, defined in Public Resources Code section 21074 as either a site, feature, place, cultural landscape that is geographically defined in terms of the size and scope of the landscape, sacred place, or object with cultural value to a California Native American tribe, and that is:				
i) Listed or eligible for listing in the California Register of Historical Resources, or in a local register of historical resources as defined in Public Resourced Code section 5020.1(k), or	☐	☐	☑	☐
ii) A resource determined by the lead agency, in its discretion and supported by substantial evidence, to be significant pursuant to criteria set forth in subdivision (c) of Public Resources Code Section 5024.1. In applying the criteria set forth in subdivision (c) of Public Resources Code Section 5024.1, the lead agency shall consider the significance of the resource to a California Native American tribe?	☐	☐	☑	☐

Environmental Setting

The Carquinez Strait represents the entry point for the Sacramento and San Joaquin Rivers into the San Francisco Bay. Dense concentrations of Native American archaeological sites occur along the historic margins of San Francisco and San Pablo Bays. In addition, archaeological sites have also been identified in the following environmental settings in all Bay Area counties: near water sources, such as vernal pools and springs; along ridgetops and on midslope terraces; and at the base of hills and on alluvial flats. Native American archaeological sites have also been identified in the inland valleys of all Bay Area counties. Remains associated with a Native American archaeological site may include chert or obsidian flakes, projective points, mortars and pestles, and dark friable soil contain shell and bone dietary debris, heat-affected rock, or human burials (ABAG, 2017).

As discussed in Cultural Resources above, the Bay Area, including Oakland, has a rich cultural history with evidence of human activity in prehistoric times, i.e., prior to 5,000

B.C, likely due to natural resources provided by the rivers, marshes and ocean. West Oakland lies within the region occupied at the time of historic contact by the Ohlone or Costanoan group of Native Americans. Coastanon designates a family of eight languages spoken by tribal groups occupying the area from the Pacific Coast to the Diablo Range, and from San Francisco to Point Sur. Modern descendants of the Costanoan prefer to be known as Ohlone. It has been suggested that the ancestors of the Ohlone arrived in the San Francisco Bay area about 800 A.D.

There was a prehistoric Native American shell mound and Ohlone burial ground in and around the Bay Street Shopping Center at Shellmound Street, Emeryville, one mile from West Oakland. Dating from 800 B.C., this shellmound, the largest of over 425 shellmounds that surrounded San Francisco Bay, is now a California Historical Landmark, #335.[21]

The arrival of the Spanish in the San Francisco Bay Area in 1775 led to a rapid reduction in native California populations. Diseases, declining birth rates, and the effects of the mission system served to eradicate aboriginal life. Brought into the missions, the surviving Native Americans were transformed from hunters and gatherers to agricultural laborers. With abandonment of the mission system and the Mexican takeover in the 1840s, numerous ranchos were established. Today descendants of the Ohlone lie throughout the Bay Area and some are active in reviving and preserving elements of their traditional culture such as dance, basketry, and song (City of Oakland, 2014).

Regulatory Background

The State CEQA Guidelines were amended effective January 1, 2015 to include evaluation of impacts on tribal cultural resources. Tribal cultural resources include sites, features, places, cultural landscapes, sacred places, and objects with cultural value to a California Native American Tribe (Public Resources Code §21074).

Significance Criteria

The proposed project impacts to tribal resources will be considered significant if:

- The project results in the disturbance of a significant prehistoric or historic archaeological site or a property of tribal cultural significance to a community or ethnic or social group or a California Native American tribe.
- Unique objects with cultural value to a California Native American tribe are present that could be disturbed by construction of the proposed project.

Discussion of Impacts

The State CEQA Guidelines were amended to include evaluation of impacts on tribal cultural resources. Tribal cultural resources include sites, features, places, cultural

[21] See https://en.wikipedia.org/wiki/Emeryville_Shellmound .

landscapes, sacred places, and objects with cultural value to a California Native American tribe (Public Resources Code § 21074). Assembly Bill (AB) 52, Native Americans: CEQA (Gatto 2014) specifies that a project that may cause a substantial adverse change to a tribal cultural resource may have a significant effect on the environment. AB 52 requires tribes interested in development projects within a traditionally and culturally affiliated geographic area to notify a lead agency of such interest and to request notification of future projects subject to CEQA prior to determining if a negative declaration, mitigated negative declaration, or environmental impact report is required for a project. The lead agency is then required to notify the tribe within 14 days of deeming a development application subject to CEQA complete to notify the requesting tribe as an invitation to consult on the project. AB 52 identifies examples of mitigation measures that will avoid or minimize impacts to a tribal cultural resource and applies to projects that have a notice of preparation or a notice of intent to adopt a negative declaration/mitigated negative declaration .

18. a) Less than Significant. As discussed under Cultural Resources above, the West Oakland area is located on the San Francisco Bay shoreline and near locations of former intermittent and perennial watercourses, that were historically used by Native Americans. Thus, there is the potential for the presence of unrecorded tribal cultural resources to be buried in West Oakland. Of the strategies that the District would implement, a number of them would apply to existing sources and could include replacing diesel engines, controlling emissions from existing facilities, and adding filtration systems to existing buildings. Other strategies would encourage the use of alternative fuels and zero emissions mobile sources (trucks, buses, locomotives). Implementation of these types of control measures would not be expected to require extensive construction or grading that could impact archaeological resources. In areas where there are sensitive resources, the City of Oakland requires pre-construction surveys and the use of qualified archaeological and tribal monitors during grading operations to identify historic resources. These standard requirements, along with the fact that the control strategies in the West Oakland Community Action Plan are not expected to require extensive construction or grading activities, are expected to limit impacts on historic cultural resources to less than significant.

Conclusion

Based upon the above considerations, no significant impacts on tribal cultural resources are expected to occur due to implementation of the Community Action Plan strategies and therefore, will not be further evaluated in the Draft EIR.

	Potentially Significant Impact	Less Than Significant Impact With Mitigation Incorporated	Less-than-Significant Impact	No Impact
XIX. UTILITIES AND SERVICE SYSTEMS. Would the project:				
a) Require or result in the relocation or construction of new or expanded water, wastewater treatment or storm water drainage, electric power, natural gas, or telecommunications facilities, the construction of which could cause significant environmental effects?	☐	☐	☐	☑
b) Have sufficient water supplies available to serve the project and reasonably foreseeable future development during normal, dry and multiple dry years?	☐	☐	☑	☐
c) 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?	☐	☐	☐	☑
d) Generate solid waste in excess of State or local standards, or in excess of the capacity of local infrastructure, or otherwise impair the attainment of solid waste reduction goals?	☑	☐	☐	☐
e) Comply with federal, state, and local management and reduction statutes and regulations related to solid waste?	☑	☐	☐	☐

Environmental Setting

Water Demand

The East Bay Municipal Utility District serves all of Oakland (including West Oakland) with potable water and with recycled water. East Bay Municipal Utility District uses its Water Supply Management Program 2040 (WSMP 2040) to assess water supply and demand over a 30-year planning period. The following water supply information was derived primarily from the East Bay Municipal Utility District Water Supply Management Program 2040.

The East Bay Municipal Utility District (EBMUD) obtains approximately 90 percent of its water supply from the Mokelumne River watershed, and transports it through pipe aqueducts primarily to temporary storage reservoirs in the East Bay Hills. The East Bay Municipal Utility District generally has water rights and facilities to divert up to a daily maximum of 325 million gallons per day (mgd) from the Mokelumne River. However, this allocation may be constrained by the rights of other users of Mokelumne River water, East Bay Municipal Utility District's ability to store water, and the amount of Mokelumne River runoff. The remaining 10 percent of East Bay Municipal Utility District's water supply originates as runoff from protected watershed lands in the East Bay Hills, and is approximately 15 to 25 mgd during normal years, but is reduced to near zero during drought conditions (City of Oakland, 2014).

Briones, San Pablo and Upper San Leandro reservoirs supply water to East Bay Municipal Utility District throughout the year; Chabot and Lafayette reservoirs serve mostly as emergency sources of supply. Seismic upgrades have been performed throughout East Bay Municipal Utility District's system, most notably at the Claremont Water Tunnel through which nearly all EBMUD's potable water travels from the east to west of the Hills, and at San Pablo Dam, the largest and most vital of that District's local water storage reservoirs.

According to the Water Supply Management Program 2040, the 2010 average daily water demand within the East Bay Municipal Utility District service area was estimated to be 251 mgd. Adjusting that number to account for conservation and recycled water program savings results in an adjusted 2010 demand estimate of approximately 216 mgd (City of Oakland, 2014).

The Water Supply Management Program 2040 includes projections of potable water demands through 2040. These future year water demands were calculated using existing and future demands for various land use categories and future changes in land use as described in the respective general plans of communities within the East Bay Municipal Utility District service area. Based on information for residential and non-residential land use categories, East Bay Municipal Utility District forecasts that unadjusted water demands would be 304 mgd by 2030, but with conservation measures and recycled water use the adjusted water demand would be approximately 229 mgd. By 2040, unadjusted water demand is projected to be 312 mgd and adjusted demand would be 230 mgd (City of Oakland, 2014).

Recycled water has been used by East Bay Municipal Utility District since the 1960s. This water is drawn from wastewater treatment plants or untreated water reservoirs and used for landscape irrigation, and industrial and commercial applications. East Bay Municipal Utility District projects use of 14 mgd of recycled water by 2020 and 20 mgd by 2040. The potential supply of East Bay Municipal Utility District recycled water from its Main Wastewater Treatment Plant in Oakland far exceeds this projected demand. Recycled water therefore provides a stable source of non-potable water not subject to rationing for landscape irrigation and other potential uses.

Wastewater Service

Wastewater collection service within West Oakland is provided by the City of Oakland's sewage collection system of sewer mains fed by private sewer laterals. The City of Oakland's wastewater collection mains connect to the East Bay Municipal Utility District's wastewater treatment system, through EBMUD's interceptors which transport sewage to EBMUD's Main Wastewater Treatment Plant (MWWTP), located at 2020 Wake Avenue in West Oakland under and immediately southwest of the I-80/I-880/I-580 interchange, better known as the MacArthur Maze. (City of Oakland, 2014).

The City of Oakland owns, operates, and maintains a local sanitary sewer collection system covering approximately 48 square miles, and includes over 930 miles of sanitary sewer lines, 31,000 structures and seven pump stations, serving a population of about 400,000 people throughout the City. Many of the lines pre-date 1938 (City of Oakland, 2014).

The average annual daily flow into the Main Wastewater Treatment Plant is approximately 80 million gallons per day (mgd). The MWWTP has an average dry weather flow design capacity of 120 mgd. During peak wet weather events, the Main Wastewater Treatment Plant has a primary treatment capacity of up to 320 mgd and a secondary treatment capacity of 168 mgd. Maximum flow can exceed capacity during storms due to infiltration of stormwater into sanitary sewage pipes. The MWWTP can provide capacity for a short-term maximum of 415 mgd through operation of an on-site wet weather storage basin, as well as two wet weather primary treatment facilities in Oakland (the San Antonio Creek wet weather treatment facility and the Oakland wet weather treatment facility). East Bay Municipal Utility District also operates a water recycling facility at the Main Wastewater Treatment Plant that treats wastewater for non-potable uses. There are no current plans to expand wastewater treatment capacity (City of Oakland, 2014).

Treated effluent is discharged from the Main Wastewater Treatment Plant to San Francisco Bay just south of the Bay Bridge approximately one mile from the West Oakland shoreline via a 102-inch diameter deep water outfall pipeline. East Bay Municipal Utility District discharges in compliance with conditions of its permits granted by the San Francisco Bay Regional Water Quality Control Board under the federal National Pollutant Discharge Elimination System (NPDES) program (City of Oakland, 2014).

Stormwater Drainage

See Section X – Hydrology and Water Quality, as well as the Wastewater Service section just above, for descriptions of the storm water in the West Oakland area.

Solid Waste

Solid waste and yard trimmings within Oakland are collected by Waste Management of Alameda County. These materials are taken to the Davis Street Resource Recovery Complex and Transfer Station in San Leandro. The Davis Street Transfer Station, which has a maximum allowable capacity of 5,600 tons of waste per day, received an average of 3,028 tons per day in 2003. This facility can process up to 320 tons per day of concrete, asphalt, dirt, bricks, wood and metal (City of Oakland, 2014).

In 2009, Oakland disposed of approximately 306,839 tons of solid waste, 264,636 tons of which went to the Altamont Landfill. Most of the remaining solid waste is sent to one of four landfills: Forward Landfill in San Joaquin County; the Keller Canyon Landfill in Contra Costa County, Potrero Hills Landfill in Solano County, and the Vasco Road Landfill in Alameda County (City of Oakland, 2014).

The Altamont Landfill has a permitted maximum daily disposal of 11,500 tons per day. The landfill comprises approximately 2,170 acres (480 acres permitted landfill area) and has a permitted maximum disposal capacity of 11,150 tons per day[22]. The Altamont Landfill is projected to have sufficient capacity to operate until at least 2031, and potential to operate through 2071, depending on waste flows and waste reduction measures (City of Oakland, 2014).

Regulatory Background

The Oakland City General Plan establishes goals and policies to assure adequate utilities and service systems are maintained within the local jurisdiction.

Significance Criteria

The proposed project impacts on utilities/service systems will be considered significant if:

- The capacities of existing or proposed wastewater treatment facilities and the sanitary sewer system are not sufficient to meet the needs of the project.
- An increase in demand for utilities impacts the current capacities of the electric utilities.
- The existing water supply does not have the capacity to meet the increased demands of the project, or the project would use a substantial amount of potable water.
- The project increases demand for water by more than 263,000 gallons per day.
- The generation and disposal of hazardous and non-hazardous waste exceeds the capacity of designated landfills.

Discussion of Impacts

[22] Calrecycle https://www2.calrecycle.ca.gov/swfacilities/Directory/01-AA-0009/

19. a) No Impact. As discussed in Section X – Hydrology and Water Quality above, the control strategies that the District would implement as part of the Community Action Plan would not be expected to require the use of additional water, result in the discharge of wastewater, or result in impacts to water quality.

As discussed in Energy above, the potential increase in energy consumption associated with the Community Action Plan will be evaluated in the EIR.

19. b) Less than Significant. Of the strategies that the District would implement as part of the Community Action Plan, a number of them would apply to existing sources and could include replacing diesel engines, controlling emissions from existing facilities, and adding filtration systems to existing buildings. Other strategies would encourage the use of alternative fuels and zero emissions mobile sources (trucks, buses, locomotives), provide shore power or bonnet systems for ships, and biofilters. Implementation of these strategies would not be expected to require the use of additional water. One of the strategies that the District would implement as part of the Community Action Plan would be the installation of vegetative borders to act as biofilters between Interstate 880 and the Prescott neighborhood in West Oakland. Installation of vegetation would likely require the use of additional water to allow for the growth of health landscape vegetation, especially when vegetation is first planted. However, the use of native vegetation would assure that vegetation that is planted would use minimal water. Nonetheless, the increase in water would be expected to be 50-150 gallons per week, which is well below the CEQA significance threshold for water use. Therefore, the project is not expected to result in significant impacts to water supplies.

19. c) No Impact. As discussed in X – Hydrology and Water above, the control strategies that the District would implement as part of the Community Action Plan would not be expected to require the use of additional water or result in the discharge of wastewater. No significant impacts on wastewater treatment facilities are expected and the proposed project would not require construction of additional wastewater treatment facilities.

19. d and e) Potentially Significant. Of the strategies that the District would implement as part of the Community Action Plan, a number of them could result in the generation of solid waste. Replacing diesel engines with new engines and encourage the use of zero emissions mobile sources (trucks, buses, and locomotives) could generate additional waste as old equipment would be taken out of service. Some of the equipment would likely be used in other portions of the state or in other states or countries, but equipment would likely be disposed of as waste. Because of metal content of vehicles and other mobile sources, they may also be recycled. Other control strategies that may generate waste would include emission control systems that use filtration (filtration systems on buildings) or other types of control equipment that use catalysts (e.g., SCR catalysts). Because of the limited landfill space and the potential increase in solid waste disposal, the impacts on solid waste disposal will be addressed in the EIR.

Conclusion

Implementation of the Community Action Plan is expected to reduce diesel particulate matter, fine particulate matter, and toxic air contaminants, and criteria pollutant emissions from facilities in West Oakland. However, implementation of several of the control strategies could result in an increase in solid waste. Therefore, potential adverse secondary impacts associated with solid waste, which could result from implementing certain control strategies, will be evaluated in the Draft EIR. As discussed in Section VI -- Energy above, the potential increase in energy consumption associated with the Community Action Plan will be evaluated in the EIR. No significant impacts were identified on water conveyance facilities, wastewater treatment facilities, or storm water drainage facility and these topics will not be addressed further in the Draft EIR.

	Potentially Significant Impact	Less Than Significant Impact With Mitigation Incorporated	Less Than Significant Impact	No Impact
XX. WILDFIRE. If located in or near state responsibility areas or lands classified as very high fire hazard severity zones, would the project:				
a) Substantially impair an adopted emergency response plan or emergency evaluation plan?	☐	☐	☐	☑
b) Due to slope, prevailing winds, and other factors, exacerbate wildfire risks, and thereby expose project occupants to, pollutant concentrations from a wildfire or the uncontrolled spread or a wildfire?	☐	☐	☐	☑
c) Require the installation or maintenance of associated infrastructure (such as roads, fuel breaks, emergency water sources, power lines or other utilities) that may exacerbate fire risk or that may result in temporary or ongoing impacts to the environment?	☐	☐	☐	☑
d) Expose people or structures to significant risks, including downslope or downstream flooding or landslides, as a result of runoff, post-fire slope instability, or drainage changes?	☐	☐	☐	☑

Environmental Setting

Wildland fires in Oakland are a concern in the Oakland Hills where wildlands abut residential development and steep terrain slows emergency vehicle access. The City has delineated a Wildfire Prevention Assessment District in the Oakland General Plan Safety Element. West Oakland is not located within an area at risk of wildland fires as no wildlands are located within the area, and it is not within the City's Wildfire Prevention Assessment District.

The California Department of Forestry and Fire Protection (CalFire) maps areas to identify significant fire hazard based on fuels, terrain, weather, and other relevant factors. These zones, referred to as a Fire Hazard Severity Zones, then determine the requirements for special building codes designed to reduce the ignition potential of buildings. West Oakland is not located within a Very High Fire Hazard Severity Zone.

Regulatory Background

The State of California has passed numerous laws to address wildlife and structural fires. Wildfire-prevention laws regulate activities in areas deemed by the state to be hazardous fire areas; the maintenance of buildings and other structures in areas covered by forest, brush, or other flammable materials; and the setting and burning of fires on open land.

Title 24 of the California Code of Regulations (CCR)[23] is the California Building Standards Code. Title 24 sets forth the fire, life-safety and other building-related regulations applicable to any structure fit for occupancy statewide for which a building permit is sought. CCR, Title 24, Part 9 is the California Fire Code that addresses automatic sprinkler systems, fire-alarm systems, access by fire-fighting equipment, fire hydrants, explosion-hazards safety, hazardous materials storage and use, protection for first responders, industrial processes, and many other general and specialized fire-safety requirements for new and existing buildings.

The City of Oakland Safety Element of the General Plans establishes goals and policies to assure adequate fire services are maintained within the City. The Oakland Fire Department is the agency with primary responsibility for preventing and suppressing fires in Oakland (City of Oakland, 2012). The City has also established building and fire prevention codes which place regulations on the separation of buildings, ventilation criteria, roof materials, landscaping, building access, and the installation of automatic fire-extinguishing systems in public buildings.

Significance Criteria

The impacts to wildfires will be considered significant if:

The project results in new structures located within or adjacent to lands classified as very high fire hazard severity zones

The project adversely effects emergency response or emergency evacuation plans.

Discussion of Impacts

20. a), b), c), and d) No Impact. The California Department of Forestry and Fire Protection (CalFIRE) maps areas of significant fire hazard based on fuels, terrain, weather, and other relevant factors. These zones, referred to as Fire Hazard Severity Zones, determine the requirements for special building codes designed to reduce the potential

[23] All state regulations in the CCR are accessible at https://govt.westlaw.com/calregs/Search/Index .

impacts of wildland fires on urban structures. West Oakland is located within an existing urbanized area that is surrounded by development. No wildlands are located in the immediate or surrounding area and the site is not within or near lands classified as very high fire hazard severity zones. The area is outside Oakland's Wildfire Prevention Assessment District boundary, which indicates that it is likely not subject to significant wildfire hazard. For these reasons, implementation of the Community Action Plan would not expose people or structures to wild fires, would not impair and adopted emergency response plan or emergency evacuation plan for wild fires, would not expose people to pollutants from a wildfire or the uncontrolled spread of a wildfire and would not expose people or structures to flooding or landslides as a result of post-fire slope or drainage changes. Therefore, no potential significant adverse impacts resulting from wildfires are expected from the proposed project.

Conclusion

Based upon the above considerations, no significant impacts due to wildfires are expected to occur due to implementation of the Community Action Plan strategies and therefore, will not be further evaluated in the Draft EIR.

	Potentially Significant Impact	Less Than Significant Impact With Mitigation Incorporated	Less Than Significant Impact	No Impact
XXI. MANDATORY FINDINGS OF SIGNIFICANCE.				
a) Does the project have the potential to substantially 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, substantially 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?	☐	☑	☐	☐
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)	☐	☑	☐	☐
c) Does the project have environmental effects that will cause substantial adverse effects on human beings, either directly or indirectly?	☐	☑	☐	☐

21. MANDATORY FINDINGS OF SIGNIFICANCE

21. a) Less than Significant With Mitigations. Physical modifications associated with implementation of the West Oakland AB 617 Community Action Plan would be limited to changes within an urbanized area that lacks habitat. According to the Open Space, Conservation and Recreation (OSCAR) Element of the City of Oakland General Plan, there are no candidate species, sensitive species, or special status species known to occur within the West Oakland area. The proposed project may require the construction of new equipment or development in the West Oakland area, but those physical changes would occur in already urbanized and developed areas, and therefore no significant impacts on biological resources would be expected.

There are a number of historic properties in the West Oakland area, with 32 designated historic properties and properties rated of the highest importance. The majority of Local Register properties within West Oakland are located within residential neighborhoods. Of the strategies that the District would implement under the Community Action Plan, a number of them would apply to existing sources and could include replacing diesel engines, controlling emissions from existing facilities, and adding filtration systems to existing buildings. Other strategies would encourage the use of alternative fuels and zero emissions mobile sources (trucks, buses, locomotives). Implementation of these types of control measures would not be expected to require the removal of any existing buildings or impact historic resources. In areas where there are sensitive historic resources, the City of Oakland requires pre-construction surveys and the use of qualified archaeological monitors during grading operations to identify historic resources. These standard requirements, along with the fact that the control strategies in the West Oakland Community Action Plan are not expected to impact or require removal of any historic structures, means that the Plan's impacts on historic cultural resources will be less than significant.

21. b) and c) Less Than Significant With Mitigations. Implementation of the Community Action Plan is expected to reduce diesel particulate matter, fine particulate matter, and toxic air contaminants, and criteria pollutant emissions from facilities in West Oakland. However, construction and operation of new air pollution control systems have the potential to increase emissions of other criteria pollutants and GHGs, generate localized impacts, increase energy use, increase hazards, and solid waste impacts. CEQA Guidelines indicate that cumulative impacts of a project shall be discussed when the project's incremental effect is cumulatively considerable, as defined in CEQA Guidelines §15065(a)(3). Cumulatively considerable impacts are defined as impacts that exceed project-specific significance thresholds. Therefore, the potential for cumulative air quality and GHG impacts will be evaluated in the Draft EIR.

REFERENCES

Association of Bay Area Governments (ABAG), 2017. Plan Bay Area 2040. Final Environmental Impact Report. June 2017. SCH#2016052041

Bay Area Air Quality Management District (BAAQMD), 2017a. California Environmental Quality Act, Air Quality Guidelines, May 2017. Available at: http://www.baaqmd.gov/~/media/files/planning-and-research/ceqa/ceqa_guidelines_may2017-pdf.pdf?la=en

BAAQMD, 2017b. FEIR for the Draft 2017 Clean Air Plan: Spare the Air, Cool the Climate: A Blueprint for Clean Air and Climate Protection in the Bay Area. Accessed August 2017. http://www.baaqmd.gov/~/media/files/planning-and-research/plans/2017-clean-air-plan/attachment-a_-proposed-final-cap-vol-1-pdf.pdf?la=en

California Department of Conservation, Division of Land Resource Protection, Contra Costa County Williamson Act FY 2012/2013. Available at ftp://ftp.consrv.ca.gov/pub/dlrp/wa/

California Department of Fish and Wildlife, California Natural Diversity Database, Available at https://www.wildlife.ca.gov/Data/CNDDB

California Department of Transportation (Caltrans), 2019. California Scenic Highway Mapping System, Alameda, County. Accessed April 4, 2019. Available at: ww.dot.ca.gov/hq/LandArch/16_livability/scenic_highways/index.htm

Federal Transit Administration (FTA), 2018. Transit Noise and Vibration Impact Assessment, September 2018. FTA Report No.l 0123. Available at: https://www.transit.dot.gov/regulations-and-guidance/environmental-programs/noise-and-vibration -

National Wetlands Inventory, Available https://www.fws.gov/wetlands/Data/Mapper.html

Oakland, City of, 2012. General Plan Safety Element. http://www2.oaklandnet.com/government/o/PBN/OurServices/GeneralPlan/DOWD009020

Oakland, City of. West Oakland Specific Plan Final Environmental Impact Report. SCH No.2012102047, May 2014. http://www2.oaklandnet.com/Government/o/PBN/OurOrganization/PlanningZoning/OAK028334

[This page intentionally left blank.]

ATTACHMENT

PUBLIC COMMENTS RECEIVED ON NOPIS

[This page intentionally left blank.]

DEPARTMENT OF TRANSPORTATION
DISTRICT 4
P.O. BOX 23660
OAKLAND, CA 94623-0660
PHONE (510) 286-5528
www.dot.ca.gov

Making Conservation
a California Way of Life!

June 10, 2019

SCH: 2019059062
04-ALA-2019-00428
GTS ID 15560

Ada Marquez, Principle Environmental Planner
Bay Area Air Quality Management District
375 Beale Street, Suite 600
San Francisco, CA 94105

AB 617 West Oakland Community Action Plan – Notice of Preparation (NOP)

Dear Ada Marquez:

Thank you for including the California Department of Transportation (Caltrans) in the environmental review process for the above-referenced project. In tandem with the Metropolitan Transportation Commission's (MTC) Regional Transportation Plan (RTP)/Sustainable Communities Strategy (SCS), Caltrans mission signals a modernization of our approach to evaluating and mitigating impacts to the State Transportation Network (STN). Caltrans' *Strategic Management Plan 2015-2020* aims to reduce Vehicle Miles Travelled (VMT) by tripling bicycle and doubling both pedestrian and transit travel by 2020. Our comments are based on the NOP.

Project Understanding
The AB 617 Plan identifies 80 potential control measures and strategies to reduce air pollution from a variety of stationary and mobile sources located in West Oakland, including the Port of Oakland. The purpose of the NOP is to seek comments about the scope and content of the environmental impact report that will be prepared for the Plan. Is Caltrans expected to be one of the governmental agencies with some responsibility in implementing the community action plan? We are not listed in the list of agencies referred to in the Initial Study. Some of the action items referred to (Action 18) infers that we will be in some way.

Land Use
The air district will study the potential air pollution and health outcomes of allowing truck traffic on I-580 and designating a truck lane on I-880. It states that allowing truck traffic on I-580 would require legislative approval and re-engineering. What project is this in reference to? There are currently no proposals by Caltrans to allow trucks on portions of I-580 where they are currently prohibited. There are no designated "truck lanes" on interstates. Is this in reference to the freight corridor project at the Macarthur Maze? If so, the air district should consult with Caltrans for clarity on the project description.

The proposal states that an urban canopy forest would identify locations that trees can be added and maintained - such as in Caltrans right-of-way. However, Caltrans is not listed as an agency that would be in charge of this and only the City of Oakland is listed. Caltrans should be consulted.

Within the West Oakland action area, Caltrans owns and operates detention basins for runoff from the San Francisco Oakland Bay Bridge that may need to be referred to here if any of the proposed action items in this document could potentially impact the basins or their ability to function as designed.

Lead Agency
As the Lead Agency, Bay Area Air Quality Management District is responsible for all project mitigation, including any needed improvements to the STN. The project's financing, scheduling, implementation responsibilities and monitoring should be fully discussed for all proposed mitigation measures, prior to the submittal of an encroachment permit. Potential mitigation measures that include the requirements of other agencies—such as Caltrans—are fully enforceable through permit conditions, agreements, or other legally-binding instruments under the control of the Lead Agency.

Encroachment Permit
Please be advised that any work or traffic control that encroaches onto the State ROW requires an encroachment permit that is issued by Caltrans. To obtain an encroachment permit, a completed encroachment permit application, environmental documentation, and six (6) sets of plans clearly indicating the State ROW, and six (6) copies of signed and stamped traffic control plans must be submitted to: Office of Encroachment Permits, California DOT, District 4, P.O. Box 23660, Oakland, CA 94623-0660. To download the permit application and obtain more information, visit http://www.dot.ca.gov/hq/traffops/developserv/permits/.

Should you have any questions regarding this letter, please contact Michael McHenry at (510) 286-5562 or Michael.mchenry@dot.ca.gov.

Sincerely,

WAHIDA RASHID
Acting District Branch Chief
Local Development - Intergovernmental Review

c. State Clearinghouse

CITY OF OAKLAND

DALZIEL BUILDING • 250 FRANK H. OGAWA PLAZA, SUITE 3315 • OAKLAND, CALIFORNIA 94612-2032

Planning and Building Department
Office of the Director

(510) 238-3941
FAX (510) 238-6538
TDD (510) 238-3254

Sent via e-mail and US Mail

June 13, 2019

Ada E. Marquez
Principal Environmental Planner, BAAQMD
375 Beale Street, Suite 600
San Francisco, CA 94105
amarquez@baaqmd.gov

Subject: Comments regarding the scope of the environmental impact report that will be prepared for the AB 617 West Oakland Community Action Plan

Dear Ms. Marquez,

Thank you for the opportunity to review and comment on the scope of the environmental impact report (EIR) that will be prepared for the AB 617 West Oakland Community Action Plan (Plan). As stated in the Notice of Preparation issued by the Bay Area Air Quality Management District (BAAQMD or Air District), BAAQMD is the lead agency undertaking both the Plan and the preparation of a program-level EIR for that Plan. The City of Oakland (City) is a not responsible agency but none-the-less respectfully submits the following comments on the scope of the EIR.

Project Description

The City supports the goal of the West Oakland Community Action Plan as stated on page 8 of the CEQA Initial Study Project Description, which is "to reduce emissions from air pollution sources within and adjacent to West Oakland...". As you know, the City actively works to reduce air pollution and has numerous policies, plans and requirements for reducing emissions including very high standards for clean construction equipment used to build projects within Oakland[1], operational requirements for projects located at the Gateway Development Area[2] of the former Oakland Army Base, and high standards for reducing greenhouse gases in our Energy and Climate Action Plan[3].

Page 9 of the Project Description states that the Plan will include strategies to achieve the goal of reducing emissions and that such strategies will include land use strategies, as well as strategies for stationary and mobile sources of pollution. Section 1.5.4 of the Project Description, page 9, states that the "land use strategies are aimed at modifying land uses to limit exposure to emissions." The Oakland City Council[4] has the ultimate authority over land use policies within the City of Oakland and while City staff supports the goals of the Plan, the City Council will direct the City's actions related to land-use strategies to address any issues contained in the Plan.

[1] See Air Quality Conditions of Approval (adopted by the City Council November 3, 2008, revised Nov. 5, 2018).
[2] See Air Quality Plan for Operations of the PODS Facility and the Air Quality Plan for Operations of the ConGlobal Facility.
[3] See Energy and Climate Action Plan, December 4, 2012.
[4] Or the Planning Commission, Director of Planning and Building, or designee.

Scope of the draft EIR

Section 1.6.4 of the Project Description titled "Actions by Other Agencies" states that the Plan

> "includes strategies proposed to be implemented primarily or exclusively by other agencies such as the City of Oakland and the California Air Resources Board. A large portion of the strategies would be implemented by agencies other than the Air District."
>
> "Further, the Air District's approval of the strategies will not authorize or commit those agencies to any action. Accordingly, Chapter 2 of the CEQA Checklist does not address implementation actions by other agencies".

The City agrees that the scope of the environmental analysis of the Plan should focus only on the strategies that will be implemented by the Air District. However, the Project Description is unclear in this regard because Sections 1.5.2, 1.5.3, 1.5.4 and 1.5.5 of Project Description summarize strategies that would be implemented primarily or exclusively by other agencies. Similarly, Attachment A of the Project Description contains all the Draft Strategies/Actions, not solely those that will be analyzed in the CEQA Checklist and in the EIR. The City requests that the Project Description and Attachment A be modified to clearly describe the Project that is being analyzed in the CEQA documents.

Additionally, the fifth paragraph in Section 1.6.1 of the Project Description states that Action 18[5] (studying allowing truck traffic on I-580 and designating a truck lane on I-880) which is an action/strategy attributed to the Air District for implementation, will not be analyzed in the EIR. We do not agree with that conclusion. Analysis of the outcomes of this action/strategy will be needed in order to evaluate the action's/strategy's efficacy. Therefore, we believe it should be analyzed in both the transportation and air quality sections in the EIR.

Thank you for the opportunity to comment on the scope of the EIR. If you have any questions, please contact Patricia McGowan at (510)238-3588 or pmcgowan@oaklandca.gov.

Sincerely,

Ed Manasse, Interim Deputy Director
Environmental Review Officer

cc: William Gilchrist
Betsy Lake
Jordan Flanders
John Monetta
Patricia McGowan
Richard Sinkoff, Port of Oakland
Henry Hilken, BAAQMD

[5] Note that Action 18 appears to reference Action 3 of Attachment A, which reads "The Air District will study the potential air pollution and health outcomes of allowing truck traffic on I-580 and designation of a truck lane on I-880. Allowing truck traffic on I-580 would require legislative approval, re-engineering and re-construction."

STATE OF CALIFORNIA GAVIN NEWSOM, *Governor*

CALIFORNIA STATE LANDS COMMISSION
100 Howe Avenue, Suite 100-South
Sacramento, CA 95825-8202

Established in 1938

JENNIFER LUCCHESI, *Executive Officer*
(916) 574-1800 *Fax* **(916) 574-1810**
California Relay Service TDD Phone **1-800-735-2929**
from Voice Phone **1-800-735-2922**

***Contact Phone:* (916) 574-1890**

June 14, 2019

File Ref: SCH #2019059062

Ada E. Márquez
Bay Area Air Quality Management District
375 Beale Street, Suite 600
San Francisco, CA 94105

VIA REGULAR & ELECTRONIC MAIL (amarquez@baaqmd.gov)

Subject: Notice of Preparation (NOP) of a Draft Environmental Impact Report (EIR) for the AB 617 West Oakland Community Action Plan, Alameda County

Dear Ms. Márquez:

The California State Lands Commission staff has reviewed the NOP for an EIR for the AB 617 West Oakland Community Action Plan (Plan). The Bay Area Air Quality Management District (Air District), as the lead agency pursuant to the California Environmental Quality Act (CEQA) (Pub. Resources Code, § 21000 et seq.), is preparing the Draft EIR for the Plan under the requirements of Assembly Bill (AB) 617 (C. Garcia 2017). The Commission is a trustee agency for projects that could directly or indirectly affect sovereign land and their accompanying Public Trust resources or uses. Additionally, if the project involves work on sovereign land, the Commission will act as a responsible agency. Commission staff requests that Air District consult with us on preparation of the Draft EIR as required by CEQA section 21153, subdivision (a), and the State CEQA Guidelines section 15086, subdivisions (a)(1) and (a)(2).

Commission Jurisdiction, Public Trust Lands, and Regulatory Authority

The Commission has jurisdiction and management authority over all ungranted tidelands, submerged lands, and the beds of navigable lakes and waterways. The Commission also has certain residual and review authority for tidelands and submerged lands legislatively granted in trust to local jurisdictions (Pub. Resources Code, §§ 6009, subd. (c); 6009.1; 6301; 6306). All tidelands and submerged lands, granted or ungranted, as well as navigable lakes and waterways, are subject to the protections of the common law Public Trust Doctrine.

A portion of the Plan encompasses the Port of Oakland, consisting of sovereign tide and submerged lands legislatively granted to the City. Beginning in 1852 and through a series of legislative grants from the state, the City was granted, in trust, certain sovereign tide and submerged lands located within its boundaries. Through the City's Charter, portions of these

Public Trust lands are within the Port of Oakland and are managed by the City acting by and through its Board of Port Commissioners.

Plan Description

The Air District proposes to implement the West Oakland Community Action Plan in response to the adoption of Assembly Bill 617. The Air District intends to work cooperatively with pollution-laden communities in West Oakland to implement identified action strategies that will maximize emission reductions and reduce disproportionate health risks from toxic air contaminates and particulate matter. The Air District aims to meet its objectives and needs as follows:

- Research, explore, and when possible adopt mandatory regulations that require stationary facilities to decrease any harmful emissions they produce.
- Use the Air District's grants and incentives programs to carry out projects that support the Plan's objectives to reduce air pollution and protect the public's health.
- Promote and advocate for policy development, best practices, community outreach, and legislation that is committed to healthy air quality and public health.

General Comments

The Commission staff would like to express enthusiastic support and a mutual commitment to the efforts put forth in the West Oakland Community Action Plan, recognizing that many of the goals the Plan has set forth closely align with the objectives the Commission established in its 2019 Environmental Justice Policy https://www.slc.ca.gov/wp-content/uploads/2018/11/EJPolicy.pdf (page 4). Commission staff encourages the actions within the Plan that will:

- "Work to reduce and mitigate adverse impacts on vulnerable communities including climate change; sea-level rise; displacement; poor air, water, and soil quality; lost economic opportunities; and inadequate access to open space and Public Trust lands and resources."
- "Support efforts by ports and others to minimize and reduce environmental and health impacts and maximize environmental and economic benefits to vulnerable communities from industrial activities within the port."
- "Leverage partnerships with public agencies, non-governmental organizations, ports, and Native Nations to advance environmental justice and achieve better outcomes for impacted communities."

Environmental Review

Commission staff requests that the Air District consider the following comments when preparing the Draft EIR, to ensure that impacts to State sovereign land are adequately analyzed for the Plan.

Environmental Justice

1. Environmental Justice: Commission staff recommends adding "Environmental Justice" to the Environmental Factors Potentially Affected Checklist (Initial Study page 36). This

dedicated section with environmental justice analysis (even if there are only positive outcomes from this Plan) would be beneficial for the local disadvantaged communities to understand how this Plan is going to distribute benefits and burdens. The Commission staff recommends including the following in the environmental justice analysis in the Draft EIR:

   a. What disadvantaged communities were reached out to in the Plan area?
   b. When were the outreach efforts initiated? When were the meetings held? How were the locals invited to those discussions?
   c. What were the outcomes that were carried into the Plan because of the outreach to the local communities?

2. Tools for Analyzing Environmental Impacts: The Commission staff recommends the environmental justice analysis section be based on the most updated tools such (but not limited to) CalEnviroScreen at https://oehha.ca.gov/calenviroscreen/report/calenviroscreen-30.
3. Consult with Local Disadvantaged and Marginalized Communities: Please make sure the local disadvantaged communities are consulted with throughout the process of carrying out this Plan, so the root causes of environmental injustices are addressed throughout this Plan to facilitate a meaningful outcome for the local communities. Recommended actions to be taken to achieve this goal are as follows:
   a. It is crucial that the local disadvantaged communities are consulted with as the Plan is being designed. Commission staff highly recommends reaching out to the surrounding communities through local community organizations. Such organizations will be most familiar with what the communities' needs are, what concerns exist, and what solutions would remove the root causes of inequities in the communities. One of the local groups with members and partners in the area is the California Environmental Justice Alliance at https://caleja.org/about-us/members/.
   b. Please incorporate the local disadvantaged communities' feedback into the Plan's design to meaningfully balance out benefits and burdens of the Plan.
   c. If benefits need to be distributed to the local disadvantaged (planting trees for example), then the local community organizations should be the primary point of contact forthe community and not the Port in order to maximize the benefits that community can receive from this Plan.
4. Climate Change: Commission staff recommends the Draft EIR analyze climate change and sea level rise impacts to the Plan since it is an important component of environmental justice.

Public Use of the Resources

5. Public Trust: Since portion of the Plan includes the Port of Oakland, please include an analysis in the Draft EIR that explains how the Port of Oakland would be responsible for managing its public trust lands and resources consistent with the proposed Plan. https://www.slc.ca.gov/Meeting_Summaries/2008_Documents/10-16-08/Complete_Items/R60.pdf.

6. Recreation: The analysis on the Initial Study page 107 says "no impact" to both of those questions in the Recreation Section. However, there can be possible impacts even if the end goal is a net positive outcome for the disadvantaged communities. Please explain how recreation along the waterfront near residential areas could be impacted or enhanced through this Plan. Can more trails or parks be added to the bayfront side of the Plan that can be available to the local communities?
7. Transportation: The analysis on the Initial Study page 110 should explain how transportation to the local waterfront sites be enhanced for these disadvantaged communities through this process to bring more benefits to the already disadvantaged communities.

Tribal Cultural Resources

8. The Commission staff recommends the following analysis be included on Initial Study page 115:
    a. Please analyze this section by consulting with the local Tribes in the area, and document that analysis and outcomes in the EIR.
    b. Please document concerns and solutions outlined in the "Beyond Recognition" documentary (http://www.beyondrecognitionfilm.com/) to make sure the proposed Plan is not violating recommendations and suggestions in this documentary.

Thank you for the opportunity to comment on the NOP for the Plan. As a trustee and responsible agency, Commission staff requests that you consult with us on this Plan and keep us advised of changes to the Plan Description and all other important developments. Please send additional information on the Plan to the Commission staff listed below as the EIR is being prepared.

Please refer questions concerning environmental review to Laura Miller, Management Services Technician, at (916) 574-1911 or laura.miller@slc.ca.gov. For questions concerning Commission jurisdiction and granted lands, please contact Reid Boggiano, Public Land Management Specialist, at (916) 574-0450 or reid.boggiano@slc.ca.gov.

Sincerely,

Eric Gillies, Acting Chief
Division of Environmental Planning
and Management

cc: Office of Planning and Research
R. Boggiano, Commission
L. Miller, Commission

EAST BAY
MUNICIPAL UTILITY DISTRICT

ALEXANDER R. COATE
GENERAL MANAGER

June 14, 2019

Ms. Ada E. Marquez
Principal Environmental Planner
Bay Area Air Quality Management District
375 Beale Street, Suite 600
San Francisco, CA 94105

Re: Notice of Preparation for the Assembly Bill 617 West Oakland Community Action Plan – Draft Environmental Impact Report

Dear Ms. Marquez:

The East Bay Municipal Utility District (EBMUD) appreciates the opportunity to comment on the Notice of Preparation (NOP) for the West Oakland Community Action Plan (CAP) Draft Environmental Impact Report (EIR). The CAP project area (Project Area) is located in the West Oakland neighborhood of Oakland, California, as defined by the California Air Resources Board (CARB) in compliance with Assembly Bill (AB) 617.

EBMUD provides critical water and wastewater services to protect public health and the health of the San Francisco Bay. EBMUD's water service area includes 1.4 million customers in Alameda and Contra Costa Counties and its wastewater service area includes 685,000 customers. Both service areas include the Project Area. EBMUD operates one of its maintenance centers and its Main Wastewater Treatment Plant (MWWTP), including portions of its interceptor system, within the Project Area. Air emissions from the MWWTP are regulated by the Bay Area Air Quality Management District (Air District).

BACKGROUND

CARB developed a Community Air Protection Program to implement AB 617. West Oakland is one of ten communities selected by CARB to participate in the program and the West Oakland Steering Committee (WOSC) was formed by the Air District to implement it. EBMUD is a member of the WOSC and appreciates the opportunity to work collaboratively with the Air District and the WOSC on this important initiative.

The excellent data set for air pollutants in the Project Area developed by the West Oakland Environmental Indicators Project have allowed the WOSC to focus on the development of emission reduction programs. Per the Community Air Protection Program, these emissions reduction programs *"must include new actions (e.g., regulations, enforcement, incentives, enforceable agreements) that go beyond existing efforts to further reduce air pollutant disparities."*

375 ELEVENTH STREET . OAKLAND . CA 94607-4240 . (510) 287-0101

EBMUD has reviewed the Initial Study for the CAP and respectfully submits the following comments.

COMMENTS

Comment 1: The EIR for the CAP should clearly state that the EIR is for Draft Strategies listed in the CAP that are under the Air District's authority.
Since the CAP includes numerous Draft Strategies that are under the authority of other agencies, such as the City of Oakland, CARB, the Port of Oakland, Alameda County Public Health Department and others, it is EBMUD's understanding and expectation that, in the event those agencies consider taking action to implement those Draft Strategies, separate environmental reviews would be undertaken by the agencies directly responsible for implementing those Draft Strategies. EBMUD will provide any comments on such measures as part of those implementing agencies' environmental review. EBMUD recommends that the EIR that will be prepared by the Air District inform the public that the scope of its environmental analysis is limited to only those Draft Strategies which the Air Board has the authority to implement.

Comment 2: More detailed information is needed on some of the Draft Strategies to evaluate potential environmental impacts.
The following comments relate to Draft Strategies under the purview of the Air Board where more detailed information is recommended:

- *Draft Strategy #24: The Air District works with agency and local partners to improve referral and follow-up on nuisance and odor complaints by 2021. This work includes updates to complaint processes, enforcement procedures and coordination with other public agencies regarding odors and open burning complaints.*

  Comment: More information is needed on the scope of the Air Board's current processes and possible improvements to determine if the improvements developed under this Draft Strategy may result in unintended environmental impacts from changes in treatment processes that may be necessary to implement the recommended improvements.

  In addition, EBMUD has a longstanding, robust process that allows members of the community to speak directly with the wastewater shift supervisor regarding odor issues. The wastewater shift supervisor investigates the report to determine if the odor is from the MWWTP, and if it is, he/she assesses if it is possible to reduce or eliminate the odor via increased chemical dosing or other means, thereby providing timely mitigation for the community.

- *Draft Strategy #66: The Air District proposes new regulations to reduce emissions from waste water treatment plants and anaerobic digestion facilities, such as a regulation to reduce emissions of methane, reactive organic gases and oxides of nitrogen by 2019.*

  Comment: It is unclear how this strategy will affect the work EBMUD is currently engaged in with Air District staff and other regional wastewater treatment plant partners to evaluate emissions reductions associated with the anaerobic digestion processes. EBMUD appreciates this partnership opportunity and looks forward to implementing programs to support essential operations and comply with practical and feasible regulations that protect public health and the environment. However, without more information about the proposed Air District regulations referenced in this draft control strategy, it is not possible to provide input on their potential environmental impacts.

- *Draft Strategy #67: The Air District proposes a regulation to reduce emissions of reactive organic gases and other toxic compounds from organic liquid storage tanks by 2020.*

  Please clarify what is meant by "organic liquid storage tanks." EBMUD is not able to evaluate the potential environmental impact without more specificity on the meaning of "organic liquid storage tanks."

The following comments relate to Draft Strategies under the purview of agencies other than the Air Board where more detailed information is recommended:

- *Draft Strategy 7 (City of Oakland): The City of Oakland revises business licensing procedures to require current and proposed businesses to disclose truck visits per day and works with Caltrans to determine the number of trucks that park in the Caltrans right-of-way near West Oakland. These efforts would help to better understand emissions and exposure in West Oakland.*

  Comment: Please provide clarity regarding the types of trucks that are included under this Draft Strategy. EBMUD has facilities located in the Project Area as well as a fleet of trucks that is used in the course of repairing and replacing critical water and wastewater infrastructure in the Project Area. It is not clear if this strategy would apply to EBMUD and its fleet of vehicles.

- *Draft Strategy 8 (City of Oakland): The City of Oakland amends existing City Ordinances and Administrative policies to list new truck yards as prohibited uses within West Oakland.*

  Comment: Please provide clarity regarding "truck yards." It is not clear if facilities such as EBMUD's that have offices and support facilities as well as a fleet of trucks used to conduct business are considered truck yards.

- *Draft Strategy 9 (City of Oakland): The City of Oakland develops a plan to limit the hours that trucks can operate in the community.*

  Comment: Please provide clarity regarding the types of trucks whose visits would be included under this Draft Strategy. It is not clear if the Draft Strategy would apply to EBMUD's fleet of trucks that are used for construction and to respond to emergency repairs in the Project Area.

Ms. Ada E. Marquez
June 14, 2019
Page 4

- *Draft Strategy 76 (CARB): The California Air Resources Board sets a limit on West Oakland's cumulative exposure to TACs.*

  Comment: EBMUD generates some emissions during the course of providing water and wastewater services. These are related to operations that are critical to EBMUD's ability to provide reliable water and wastewater services to the people in the Project Area, such as individual wastewater treatment processes, or trucks responding to locations in the Project Area to repair a broken water main or to proactively replace aging pipelines. EBMUD strives to implement programs that extend beyond regulatory compliance stipulations and actively collaborates with regulatory agencies, local agencies, NGOs, and the public to understand their needs and balance those needs with its operations. EBMUD aims to provide essential services 24 hours a day, 7 days a week while protecting public health and the environment. EBMUD requests that, before adopting a cumulative exposure limit, CARB work with EBMUD to better understand water and wastewater operations to ensure that the proposed new limit will not impede EBMUD's critical services.

<u>Comment 3: EBMUD requests that the analysis described in the Utilities and Service Systems section under item "19.a" be revised from "No Impact" to "Potentially Significant," and that the EIR include analysis of the potential impact of the CAP's Draft Strategies on wastewater utilities.</u>
The analysis under XIX Utilities and Service Systems states that *"the control strategies that the District would implement as part of the Community Action Plan would not be expected to…result in the discharge of wastewater, or result in impacts to water quality.*" This conclusion misses the primary focus of item 19(a), which is whether the project would lead to construction of new utility facilities, including wastewater treatment facilities. In fact, Draft Control Strategy #65 which would *"identify incentives to improve the shortcut nitrogen removal processes at waste water treatment plants to reduce emissions by 2025"* could lead to the need for new facilities at the MWWTP. EBMUD does not currently have any nitrogen removal process in its wastewater treatment system and implementing "shortcut nitrogen removal processes" would require the addition of substantial new equipment and facilities, resulting in potential impacts during construction and future operations. There are also other strategies that, when they are better defined, may require new, expanded, or reconstructed wastewater treatment processes. Potential environmental impacts associated with the construction of new wastewater treatment facilities necessary to meet new regulatory requirements should be analyzed in the EIR.

In addition, EBMUD is actively engaged in a regional strategy and partnership with the San Francisco Regional Water Quality Control Board (SFRWQCB) to study and evaluate nutrients in wastewater effluent and their overall impacts to the San Francisco Bay. The results of these long-term science-based studies will result in recommendations for nutrient treatment upgrades, if needed, at regional wastewater treatment plants. EBMUD recommends the SFRWQCB process conclude before the Air District makes recommendations and sets requirements for the same process.

CONCLUSION

EBMUD appreciates the opportunity to coordinate with the Air District on this project and requests that the Air District continue to include EBMUD in the WOSC as it refines the CAP, develops the EIR, and implements the final CAP. EBMUD looks forward to continuing to collaborate with the Air District to ensure the success of this project.

If you have questions or would like additional information regarding the comments provided in this letter, please contact Matt Hoeft at (510) 287-0214 or Matt.Hoeft@ebmud.com.

Sincerely,

Alexander R. Coate
General Manager

ARC:EW

[This page intentionally left blank.]

PORT OF OAKLAND

June 14, 2019

Ada E. Márquez
Principal Environmental Planner
Bay Area Air Quality Management District
375 Beale Street, Suite 600
San Francisco, CA 94105
amarquez@BAAQMD.gov

via email

Subject: **Port of Oakland Comments on Notice of Preparation of a Draft Environmental Impact Report for the AB 617 West Oakland Community Action Plan**

Dear Ms. Márquez:

The Port of Oakland ("Port") appreciates the opportunity to provide comments on the Bay Area Air Quality Management District's ("BAAQMD") May 13, 2019, Notice of Preparation ("NOP") of a Draft Environmental Impact Report ("DEIR") for the AB 617 West Oakland Community Action Plan ("WOCAP"). An Initial Study ("IS") accompanied the NOP. The IS consists of a Project Description and Environmental Checklist Form. The IS identifies the environmental factors potentially affected by the WOCAP. The resource areas the BAAQMD identified to be further analyzed in the DEIR are 1) Air Quality, 2) Biological Resources, 3) Energy, 4) Greenhouse Gas Emissions, 5) Hazards & Hazardous Materials, and 6) Utilities & Service Systems.

Port staff have served on the AB 617 Steering Committee since the July 27, 2018 kick-off meeting at City Hall, where Board of Port Commissioners ("Port Board") President Cestra Butner provided opening statements and Port Environmental Supervisor Diane Heinze described the Port's Draft Seaport Air Quality 2020 and Beyond Plan. The result of the AB 617 Steering Committee process is the WOCAP, currently being created by BAAQMD and the West Oakland Environmental Indicators Project ("WOEIP"). The Port understands that the strategies that will be included in the WOCAP are intended to reduce emissions and improve air quality in West Oakland. The Port understands that the DEIR is scheduled to be published for public comment around July 19, 2019, approximately the same time as the Draft WOCAP is published. The simultaneous release of the DEIR and the Draft WOCAP limits the ability of the Port and other stakeholders to provide meaningful comments on both the scope of the DEIR and the WOCAP, since the WOCAP is not yet available.

<u>About the Port</u>

The Port of Oakland is currently the eighth busiest container port in the United States based on annual container volume. The Port handled approximately 2.5 million twenty-foot equivalent units ("TEUs") of cargo in calendar year 2018 with four active marine terminals. All ship-to-shore container cranes at the Port are electric. Port-related equipment and activities are highly regulated.

- All container lift and horizontal transport equipment is regulated to Tier 4 off-road engine standards by the California Air Resources Board ("CARB"), which adopted and enforces a Mobile Cargo-Handling Equipment ("CHE") at Ports and Intermodal Rail Yards Regulation for California seaports.
- Drayage trucks serving the Port are all newer than 2007 and use diesel particulate filters.
- By the end of 2022, every truck will have model year 2010 or newer engines pursuant to the CARB Drayage Truck Regulation. Trucks newer than 2010 have selective catalytic reduction for NOx control.
- The Port runs a shore power program, with 75% of all 2018 calls using shore power.

Under the City Charter of the City of Oakland ("the Charter"), the Oakland Board of Port Commissioners is the legislative body of the City having complete and exclusive power and duty to control the "Port Area," as defined in the Charter, and to enforce rules and regulations for the purposes of the Port. The Port Area includes all the waterfront properties and lands adjacent thereto, including trust lands granted to the City by the State of California. The Port is not a typical public agency. As an enterprise department of the City of Oakland, the Port of Oakland does not collect tax revenues for itself, but instead must generate revenue to be self-supporting.

In late 2017, the Port began an 18-month process of drafting a new Seaport air quality plan since the Port's Maritime Air Quality Improvement Plan ("MAQIP") has a planning horizon from 2009 to 2020. The process of drafting a new Seaport air quality plan involved extensive stakeholder engagement. Two of the four co-chairs guiding the process for the Port's new seaport air quality plan are BAAQMD and WOEIP, who are also the two co-chairs of the WOCAP effort. The Seaport Air Quality 2020 and Beyond Plan ("2020 and Beyond Plan") establishes the Port's long-term vision of a zero-emissions seaport. The 2020 and Beyond Plan provides a framework for making future decisions on clean air projects involving community feedback. The Port Board approved the 2020 and Beyond Plan on June 13, 2019, and directed Port staff to:

1. Submit an Agenda Report to the Board within six months on the feasibility of replacing all CHE at the Port with zero-emissions equipment including the feasibility of related goals and metrics;
2. Submit an Agenda Report to the Board within six months on the feasibility of replacing all drayage trucks at the Port with zero-emissions trucks including the feasibility of related goals and metrics;

3. Submit an Agenda Report to the Board within six months on the capacity of the Seaport's electrical system, tenant needs for electric vehicle charging equipment, and the ability of the Port to provide electric vehicle charging equipment;

4. Submit an Agenda Report to the Board by June 1, 2020 on Port-related strategies and/or implementing actions that are legally required or that, in the Port's judgment, may meet the 2020 and Beyond Plan feasibility criteria, as a result of the final WOCAP prepared pursuant to AB 617 and any potential related updates to the 2020 and Beyond Plan;

5. Submit an Agenda Report to the Board within 18 months on 2019 emissions associated with ocean going vessels, tugboats, and rail tenants (BNSF and West Oakland Pacific Railroad), and on performance incentive programs for ocean vessels and rail tenants; and

6. Submit an Agenda Report to the Board within 18 months on costs and financing aspects associated with the 2020 and Beyond Plan including discussions of grant and incentive funding opportunities from outside sources (i.e., CARB, BAAQMD, and the California Energy Commission, etc.) and private sector and Port resources.

The Port shares the WOCAP goals of reducing harmful air emissions and reducing health risk impact on Port workers and the community. As published in the 2017 Seaport Emissions Inventory, the Port has achieved an 81% reduction in emissions of diesel particulate matter ("DPM") between 2005 and 2017, while cargo volume grew 6.5%.[1] A partial list of the numerous Port air quality improvement actions and achievements since 2009 is included below to provide background and highlight the Port's long-standing commitment to improving air quality. Port staff look forward to building on this success to further reduce emissions and contribute to improving the health of Port workers and the community.

1. The Port developed the MAQIP, which was approved by the Board on April 7, 2009, after the Board adopted the Maritime Air Quality Policy Statement on March 18, 2008 ("Policy Statement"). The Policy Statement documented the Port's adoption of the goal of reducing the health risks to its neighboring communities (expressed as increase in cancer risk) related to exposure of people to DPM emissions from Port sources by 85% by the year 2020 through all practicable and feasible means. The MAQIP expressed that goal as an 85% reduction in DPM emissions.
2. In 2010, CARB, BAAQMD, the Port, and the US Environmental Protection Agency ("EPA") collectively invested $33 million (with the Port's share being $5 million) in funding to initially retrofit 1,319 trucks and to subsequently replace an additional 627 trucks.
3. In 2013, the Port applied for and was awarded an EPA National Clean Diesel Funding Assistance program grant in the amount of $415,932 to repower four rubber tire gantry ("RTG") cranes to help reduce the diesel emissions related to off-road equipment operating on the Port's marine terminals. This RTG repowering project was completed and the grant file closed by the end of 2017.

[1] A detailed review of past and forecasted cargo growth should be available from the Bay Conservation and Development Commission ("BCDC") by June 17 as part of its proposed SF Bay Plan Amendment.

4. In 2017, the Port advocated before the CARB board for a more expansive eligibility determination for the CARB Zero and Near Zero Freight Facilities ("ZANZEFF") transportation electrification program, as the original staff guidelines could have excluded the majority of the seaport tenants and customers from receiving grant funding. As part of the ZANZEFF grant project, it is expected that $9 million will be awarded to improve air quality associated with Port seaport operations, out of a larger multi-port grant award, to demonstrate the viability of zero emissions cargo handling equipment and heavy-duty Class 8 electric trucks in seaport operations. The Port entered into a Memorandum of Understanding ("MOU") with the Port of Long Beach dated February 7, 2019, to implement the ZANZEFF grant project. As part of the ZANZEFF project and pursuant to the MOU, the Port committed to design and install ten charging stations and provide for a financial match of at least $1.25 million.
5. In 2018, the Port assisted with the successful application from one of its marine terminal operators for nearly $5 million in Carl Moyer air quality program funding from BAAQMD to replace and upgrade the diesel engines from all thirteen of that terminal operator's gantry cranes to a hybrid-electric system that reduces emissions of some air pollutants by 99%. As of June 2019, two of the thirteen cranes have been successfully repowered and are in use. The remaining eleven cranes will be done in series before June 15, 2020.
6. The Port spent approximately $55 million (including grant funding) to install shore side power at 11 berths at the Port. The shore side power implementation program was led by the Port in association with private marine terminal operators and ship owners, and was completed with $27 million in grant funding assistance from CARB, BAAQMD, the US Department of Transportation ("DOT") (via a Transportation Investments Generating Economic Recovery grant), and the Metropolitan Transportation Commission (via a federal pass-through DOT Congestion Management and Air Quality program grant).
7. These efforts, in combination with CARB regulations requiring emissions reductions from CHE, drayage trucks, refrigerated transportation units, ocean-going vessels, and harbor craft, have reduced DPM emissions from Port seaport operations. In 2018, the Port conducted the fourth update to its Seaport Emissions Inventory, using data from 2017 operations. The 2017 Seaport Emissions Inventory calculated that DPM emissions from trucks serving the seaport decreased 98% from the 2005 baseline. The Port's 2017 Seaport Emissions Inventory concluded that, overall, DPM emissions from Seaport sources decreased by 81%. These calculations are based on emission inventories rather than continuously measured emissions, using methods consistent with CARB's inventories.
8. The Port hosts weekly Trucker Office Hours every Thursday at the Customer Service Area near the terminal truck gates, an environmental initiative that began in August 2018. Trucker Office Hours allow Port staff to inform truck drivers about grant and voucher funding opportunities for cleaner equipment, assist with the grant application process, and provide updates on the latest zero-emissions demonstration projects. BAAQMD staff are always welcome to attend these office hours, which Port staff find to be a rewarding and productive way to advertise the technologies and funding available to truck drivers.

Air Quality Improvement is a Strategic Priority at the Port of Oakland (*Growth with Care)*

In 2018, the Port published its five-year strategic plan called "Growth with Care" that harmonizes business growth with community and environmental benefits.[2] Growth at the Seaport will occur in a context of strict State and local regulation. California seaports lead the way in the use of Tier 4 CHE, model year 2007 and newer trucks, and shore power. Outside California, where some of the Port's competitors operate, these requirements do not apply. Due to the actions taken pursuant to the MAQIP and to comply with BAAQMD and CARB regulations, Port emission reductions have vastly outpaced Port growth since 2005. The 2020 and Beyond Plan represents the Port's continued commitment to improving the air quality in West Oakland.

The Port's compound annual growth rate (CAGR) from fiscal year 2008 to fiscal year 2018 was 0.4%.[3] The Port's fiscal year 2019 through fiscal year 2020 Operating Revenue Budgets are based on cargo growth estimates ranging from 0% to 2.0% annually. Budget projections through fiscal year 2024 reflect similar growth assumptions. The Port expects no growth in the number of annual vessel calls. In fact, the number of vessel calls has been decreasing in recent years, as the trend has been to bring the same or more cargo volume on fewer, larger ships.

The Port understands that part of the WOCAP effort will involve forecasting emissions five and ten years out. This necessitates cargo growth forecasts for the Port. CARB stated in its rulemaking documents for the Proposed Control Measure for Ocean-Going Vessels At Berth that it will assume a CAGR of 4.6% for the Port, based on its interpretation of the Federal Highway Administration Freight Analysis Framework Version 4.3.1 data. However, the Port maintains its position that this cargo growth estimate is overly aggressive and therefore misleading in the context of forecasting emissions.

The Port's 2009 MAQIP contains a discussion of growth projections in Section 6. In the low growth scenario, annual cargo volume was projected to reach 4.5 million TEU by 2020. The Port is currently at approximately 2.5 million TEU annually. This illustrates the difficulty with forecasting cargo growth even ten years out. While there may be short periods of high growth which may reach or exceed 4.6%, there will also inevitably be short periods of low growth or volume declines—the historic record clearly proves this to be true.

The BAAQMD has indicated to the Port that it may revise the growth assumptions between the forecast in the July 2019 draft WOCAP and the final forecast (estimated October 2019), based on additional information from BCDC and CARB. To avoid confusion and a misleading "first impression," the Port requests that BAAQMD's initial July 2019 draft forecast include an alternative growth scenario of about 2%, alongside the 4.6% growth scenario. Communication records with BAAQMD, CARB, and BCDC about growth forecasts are included as Attachment 1 to this letter.

---

[2] https://www.portofoakland.com/strategic-business-plan-2018-2022/

[3] From Budget and Finance report at May 23, 2019 Port Board Meeting (File ID 098-19), slide 6.

<u>The Port is Not a Responsible Agency Under CEQA</u>

The Port offers these comments on the NOP and IS as a member of the AB 617 Steering Committee and as a committed participant in reducing emissions in West Oakland. In the specific case of the WOCAP, the Port is not a Responsible Agency as defined under the California Environmental Quality Act ("CEQA"). CEQA Guidelines section 15381 states "'Responsible agency' means a public agency which proposes to carry out or approve a project, for which a lead agency is preparing or has prepared an EIR or negative declaration. For the purposes of CEQA, the term 'responsible agency' includes all public agencies other than the lead agency which have discretionary approval power over the project."

As stated in Section 1.6.4 of the NOP, "control strategies proposed to be implemented primarily or exclusively by other agencies…are included for information purposes only, however. They are not dependent on approval of the control strategies that are under the authority of the Air District. Further, the Air District's approval of the control strategies will not authorize or commit those agencies [including the Port] to any action. As these actions and activities by independent agencies are not Air District actions and will occur independently of the District's approval of the control strategies under their authority, they are not direct or indirect effects resulting from approval of the Plan that must be analyzed in this document. Accordingly, Chapter 2 [Environmental Checklist] does not address implementation actions by other agencies that are independent of the Air District's implementation actions under the Community Action Plan."

For the reasons discussed above, the Port will not be relying on the AB 617 WOCAP EIR to provide environmental review for future discretionary actions. In addition, the Port will not be making any discretionary approvals for the BAAQMD actions listed in Attachment A to the Initial Study. While Section 1.1 of the Initial Study states the Port is one of the government agencies with "primary responsibility for implementing the strategies in the [West Oakland] Community Action Plan," the Port is not a Responsible Agency under CEQA.

<u>Comments on Section 1.0 Project Description</u>

Project Objectives

CEQA Guidelines section 15124(b) states "A clearly written statement of objectives will help the lead agency develop a reasonable range of alternatives to evaluate in the EIR and will aid the decision makers in preparing findings or a statement of overriding considerations, if necessary. The statement of objectives should include the underlying purpose of the project."

Section 1.0 of the Initial Study contains the Project Description and provides background on AB 617. Section 1.1 describes the proposed WOCAP and its strategies to "maximize emission reductions and reduce residents' cumulative exposure to criteria air pollutants, diesel particulate matter (Diesel PM), fine particulate matter ($PM_{2.5}$), and toxic air contaminants" and "work towards eliminating West Oakland's air pollution burden." The WOCAP is described as "an integrated multi-pollutant community air quality plan to eliminate health risk disparities in West Oakland." The Project Description in Section 1.5 of the Initial Study states "[t]he goal of the Community Action Plan is to reduce emission from air pollution sources within and adjacent to West Oakland."

The Port of Oakland requests that the DEIR Project Description include a comprehensive objectives statement to remove confusion about the goals of the WOCAP. The WOCAP strategies should support the goals. Many of the proposed actions are not related to emission reductions, such as street sweeping, barrier walls, tree canopy, air filtration, biofilters, etc. Similarly, Action #51 seems to be about safety, "Safe Routes to School." Is safety a goal of the WOCAP?

Section 1.4 Project Background

The Port requests that BAAQMD present more background information in the DEIR than is currently provided in Section 1.4, Project Background. This request is consistent with CEQA Guidelines section 15125(h), which states "[a]n EIR must include a description of the physical environmental conditions in the vicinity of the project…from both a local and regional perspective." The Port requests more information about the State and regional setting for emissions and health risk. Information in this section may need to be repeated in the Air Quality Settings section of the DEIR, but it is important for the reader to understand the context early on.

- In light of the 81% DPM emissions reductions from Port sources between 2005 and 2017, the Port requests a comparison of ambient air and DPM emissions in 2005 and 2017. Port staff understand from BAAQMD Air Quality Summaries that the BAAQMD did not operate PM monitors in Oakland until 2007, and no PM monitor in West Oakland until 2009. Can other regional monitors be used to show the improvement in the ambient air over this time period?

- Item 5 on page 2 of the NOP indicates that the CARB monitoring plans required by October 1, 2018 would be ready and supplying information by July 1, 2019. The Port requests that BAAQMD add a table to the DEIR summarizing the monitoring results for the Bay Area as a whole and provide more regional and state-wide context.

- In addition to summarizing the regional attainment status and criteria air pollutant monitoring, Port staff request a discussion of toxic air contaminant monitoring in the Bay Area. This should include any information from BAAQMD Rule 12-16 and the AB 617 CARB monitoring plans and initial monitoring.

- Port staff request a comparison between the 2008 CARB Health Risk Assessment ("HRA") for West Oakland, the 2009 BAAQMD HRA for West Oakland, and the 2017 BAAQMD HRA for West Oakland prepared in support of the WOCAP. The comparison could include the differences in the domain and types of modeled sources. To accompany this comparison between HRAs, Port staff request an emissions comparison (DPM emissions by source, in tons per year) between 2005 and 2017.

- The San Francisco Community Risk Reduction Plan "HRA" is scheduled to be published in summer 2019. The Port requests a comparison of the 2017 West Oakland HRA with San Francisco's HRA, the 2008 ARB HRA for West Oakland and the South Coast Air Quality Management District Multiple Air Toxics Exposure Study ("MATES").

- Port staff understand that the West Oakland HRA Technical Report will be an appendix to the WOCAP. Please also include a summary of the results in the DEIR to inform readers about the current contribution of each source to local cancer risk.

- If a feasibility analysis of the strategies is included in the WOCAP, Port staff request that the analysis of the strategies includes a summary of the cost effectiveness relative to health impact reduction. For example, BAAQMD's analysis shows that drayage trucks serving the Port contribute 2% to cancer risk, and non-Port trucks on the streets and highways contribute 37% to cancer risk. The same analysis shows that the Union Pacific (UP) Rail Yard near the Port contributes 8% to cancer risk, and that locomotives through the area, including Amtrak, contribute 7%.

Section 1.5 Project Description

Recent CEQA case law has established that an EIR must contain an "accurate, stable, and finite" project description (*Washoe Meadows Community v. Department of Parks and Recreation,* November 15, 2017). This case notes that "[a] description of a broad range of possible projects, rather than a preferred or actual project, presents the public with a moving target and requires a commenter to offer input on a wide range of alternatives that may not be in any way germane to the project ultimately approved." Based on the discussion in Section 1.6.4, the project to be evaluated in the EIR is limited to the actions under the jurisdiction of the BAAQMD, and not the full list of actions in Attachment A to the Initial Study.

The Port recommends that the Project Description be revised to clearly state the scope of the project description, and include possible actions by other agencies in a discussion separate from the project description. The Port recommends that the Project Description be revised to clearly state the scope of the project description, consisting primarily of the 26 actions under the authority of BAAQMD listed in Attachment A of the Initial Study. The DEIR could include a discussion of possible actions by other agencies somewhere other than the project description. For example, in the background section, the DEIR could include a discussion of the AB 617 planning process and a list of the other agency actions, with a statement that they are included for informational purposes.

Section 1.5 includes a 3-item bullet list at the bottom of page 8. The list does not include some of the seemingly major contributors to local health risk, such as Union Pacific Rail Yard, Amtrak, CalTrans and the U.S. Postal Service facility located on 7th Street. The Port would like to understand how the WOCAP will meet its equity goals and best serve the community if it is silent on these potentially major sources.

The Port recommends that BAAQMD add more detail on its proposed actions. Some questions and suggestions for specific BAAQMD actions are provided below.

- BAAQMD Action #21 Land Use (Sustainable Freight Advisory Committee): The Port already has an established Task Force for air quality issues (MAQIP and 2020 Plan), of which BAAQMD and WOEIP are Co-Chairs. The Port suggests using the Port Seaport Air Quality Task Force, rather than creating a new forum.

- BAAQMD Action #41 Other Mobile Sources (Buy Back Old Autos): Clarify whether the Air District will offer more money if the old trucks are registered in West Oakland versus other neighborhoods in Oakland or the Bay Area.

- BAAQMD Action #43 Other Mobile Sources (Upgrade Tugs and Barges): Please explain which barges are included in this action and what emission sources are associated with barges.

- BAAQMD Action #60 Stationary Sources (ISR): Please refer to this as Indirect Source Rule ("ISR") instead of "magnet source" to reduce confusion.

  Growth in cargo may lead to more CHE or drayage truck activity, but may not lead to additional vessel calls, give current vessel size trends may. CHE and drayage trucks are each currently 2% of the population-weighted health risk and DPM concentration in West Oakland (see table above). Any growth in CHE or drayage truck activity which is not offset by cleaner equipment and operational efficiencies will incrementally increase these 2% impacts.

- BAAQMD Actions #69 and #72 Health Programs (Air Filters): Please make sure that any filter installation project includes a description of funding and management for filter maintenance.

The Port suggests that BAAQMD actions in the WOCAP that are currently not possible to evaluate under CEQA because they are "too speculative for evaluation" be removed from the DEIR Project Description and environmental impact assessment. Alternately, BAAQMD could identify assumptions or "boundaries" for more speculative actions to provide enough specificity for evaluation. For example, for Action #3 (incorrectly identified as Action #18 on page 12, please fix), BAAQMD could make reasonable assumptions about a high/low percent of trucks shifting traffic to I-580 and perform the impact analysis.

Comments on Section 2.0 Environmental Checklist Form

The Port submits the following comments on the scope of the DEIR. As described in Section 1.6.4, the Environmental Checklist and the DEIR apply only to BAAQMD actions. Accordingly, Port comments on the scope of environmental review only address potential impacts of BAAQMD actions.

Overall Comments

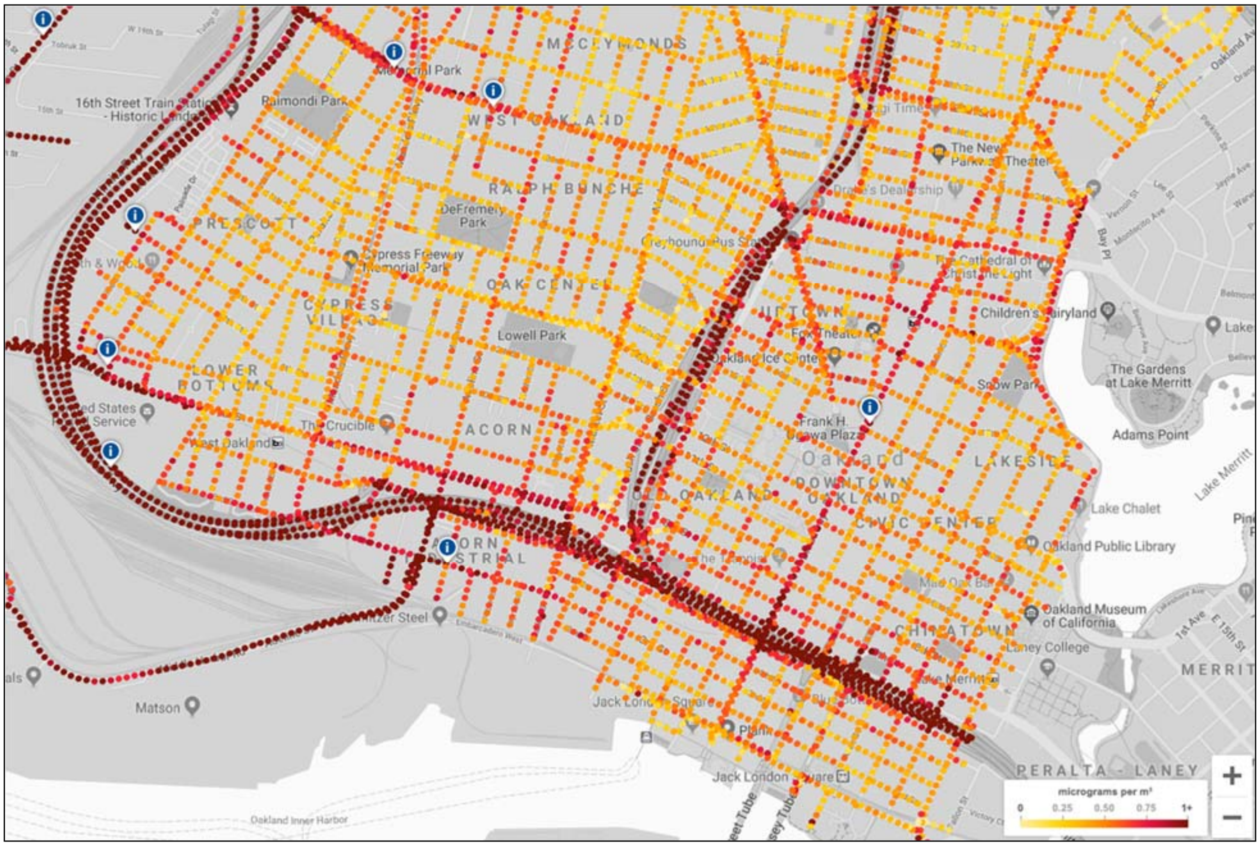
Most of the environmental resource sections in the IS checklist begin with a lettered list of significance criteria in a tabular format, but then in the discussion include a bullet list of Significance Criteria that differs from the first set of criteria. As a result, it is unclear if the checklist has identified the full range of potentially significant impacts that will be addressed in the DEIR. The DEIR should provide a single list of significance criteria for each resource section, and structure the impact analysis accordingly.

The Port requests that BAAQMD identify which actions are being analyzed for which environmental resource areas, using a table formatted similar to below. The Port is most interested in the resource areas listed in the table.

Action #	Air Quality	Energy	GHG	Hazard.	Land Use	Noise	Population	Transp.	Utilities
2									
3									
12									
14									
21									
24									
34									
41									
42									
43									
44									
45									
46									
47									
50									
59									
60									
61									
62									
63									
64									
65									
66									
67									
69									
74									

Air Quality

As noted in Comments on Section 1.4, Project Background, Port staff request that the Air Quality Setting section describe the monitoring, health risk modeling, and recent (since 2005) air quality studies specific to West Oakland. For example, a recent monitoring study co-authored by WOEIP and BAAQMD and published in Environmental Science & Technology (2017), measured daytime levels of black carbon and NOx in East Oakland, West Oakland, and Downtown Oakland.[4] The map below of black carbon measurements in micrograms per cubic meter in West Oakland and Downtown Oakland shows that the neighborhoods may be similarly impacted.



1. Using mean instead of median: Port staff note that different presentations of this map have been held at different meetings. One such map uses red dots to show instances of black carbon above median. Please use mean instead of median, because using median ensures that exactly half of all readings are highlighted red which could lead to misunderstandings. Please use mean, or average, instead and make sure to document in the footer the average value and state the geographic boundary of the average value. For NOx, a comparison to the NAAQS would provide valuable context.

2. Port staff understand that BAAQMD, as the Lead Agency under CEQA, has the discretion to select its own thresholds of significance. The WOCAP is focused on a single neighborhood—West Oakland—and not the region. However, BAAQMD has selected the Regional Plan threshold in the BAAQMD's May 2017 CEQA Guidelines. The Initial Study cites "The Air District's draft CEQA Guidelines (BAAQMD, 2017a)" on page 50. Port staff request clarification as to whether the BAAQMD CEQA Guidelines are draft and not final, as they are not noted as Draft on either the website or on their cover page.

[4] https://www.edf.org/airqualitymaps/oakland/pollution-and-health-concerns-west-oakland

3. Please include emission reduction estimates for every action included in the DEIR project description since this is the primary area of interest of the WOCAP. The estimates will be useful even if they are speculative, as long as the assumptions are reasonable and clearly stated. A low/high bounding can be used to indicate level of uncertainty. Please also include an order of magnitude cost estimate. This will help the community make informed decisions about how to prioritize strategies and understand which solutions are the most cost-effective.

4. The Port notes that some of the actions may have undesirable consequences. For example, Action #42 is to replace diesel trucks with battery-electric. The batteries for Class 8 drayage trucks are so heavy that the trucks cannot carry a full load of cargo outside of specially designated overweight routes. This means that the weight of the battery has to come out of the cargo load. This in turn means an extra trip to a warehouse for “re-stuffing” the cargo, and an additional truck trip to spread out the load. These extra activities should be included in the analysis. This would affect the Transportation section as well.

5. If any of the 26 BAAQMD actions anticipate relocation of existing sources of pollution, the DEIR should address impacts associated with their new locations.

Energy

6. Action #18 has PG&E listed as the authority, but the description starts as a BAAQMD action to advocate for more electrical infrastructure. If this is a BAAQMD action, please describe any increased load on PG&E infrastructure due to the actions being analyzed, individually and cumulatively. Please include any information on communications with PG&E on the issue.

Greenhouse Gas Emissions

7. Page 74 of the Initial Study mentions modifications to refineries. To which refineries does this refer?

8. Action #45 is about a hydrogen fueling station. The GHG analysis should address where the Air District would procure the hydrogen and how it would it be made. Please include the life cycle of the hydrogen in the analysis to ensure that it does not unintentionally create more carbon dioxide (CO_2), a GHG. Please state whether the hydrogen will be subsidized to bring the cost in line with other fuels and electricity. Please identify the source of the subsidy, and how long it would it last. This latter information may belong in the Project Description.

Hazards & Hazardous Materials

9. Action #59: Please include in the impact analysis the handling and disposal of the waste stream produced by any scrubber or “bonnet” system. It is important to understand the impact of the entire life-cycle of the exhaust, once scrubbed.

Land Use & Planning

10. The 6th bullet, at the bottom of page 87, says that the Union Pacific Rail Yard is within the Port. That statement is incorrect. The Union Pacific Rail Yard is not within the Port; please correct this statement.

11. Action #18 says that PG&E is the authority, but the text begins with BAAQMD action to advocate for more electrical infrastructure and better land use support for electric trucks. If this is a BAAQMD action, please include an analysis of its land use impacts, such as land required for trucks to park while they charge overnight.

12. Some proposed actions address land use restrictions in industrial areas. Land Use, Population and Housing, and Transportation analyses should address the implications of such restrictions. Please include in the analysis any indirect impacts and how they affect the population.

Noise

13. This section identifies the potential noise impacts from construction activities. The DEIR should identify which BAAQMD actions entail construction activities that may generate noise.

Transportation

14. Action #3: Allowing trucks on I-580 should be analyzed using assumptions, such as reasonable low and high estimates of the percentage of trucks that would shift from I-880 to I-580. This would help the reader understand the range of possible impacts, including increased congestion and air emissions on I-580, increased potential for accidents on I-580, and increased construction impacts from more frequent repaving due to increased pavement wear from trucks on I-580.

Utilities & Services Systems

15. Action #46 is about Air District efforts to replace long haul diesel trucks owned by West Oakland businesses with zero emission trucks. This, will require a network of public truck charging stations throughout the Bay Area, the State, and beyond since long haul trucks cross state boundaries. Please address this need in the analysis. Please also address in the Land Use section the need for overnight parking and charging locations locally. Charging stations require a lot of space both to physically park and maneuver large trucks as well as sufficient parking stalls for overnight charging. Please include analysis for increased electrical demand locally. For example, will a new substation or more transmission capacity be required to meet demand? Where would new infrastructure be located? Impacts associated with new infrastructure should be addressed in this section.

Closing

Thank you for the opportunity to comment on the scope of the proposed DEIR. My staff and I look forward to discussing these issues with you. If you have any questions, please contact me at (510) 627-1182 or rsinkoff@portoakland.com.

Sincerely,

Richard Sinkoff
Director of Environmental Programs & Planning

CC: Chris Lytle, Executive Director
Danny Wan, Port Attorney

Attachment 1

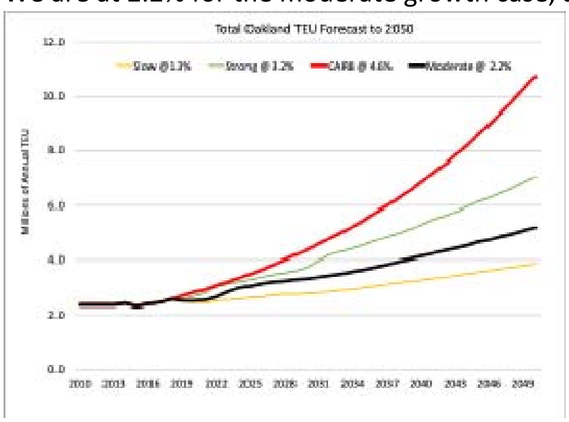
Catherine Mukai

From: Dan Smith <dsmith@tiogagroup.com>
Sent: Friday, June 14, 2019 9:43 AM
To: Catherine Mukai; Michael Murphy; Phil Martien; eyura@baaqmd.gov; David M. Holstius; Henry Hilken; Pournazeri, Sam (sam.pournazeri@arb.ca.gov); david.phong@arb.ca.gov; bonnie.soriano@arb.ca.gov; Parmer, Cory@ARB; Foster, Jonathan@ARB; Furey, Russell@ARB; Scourtis, Linda@BCDC; daniel@hackettassociates.com; Delphine Prevost; Diane Heinze; Tracy Fidell
Subject: [EXTERNAL] Re: BAAQMD/ARB/BCDC/Port 6/11 call notes

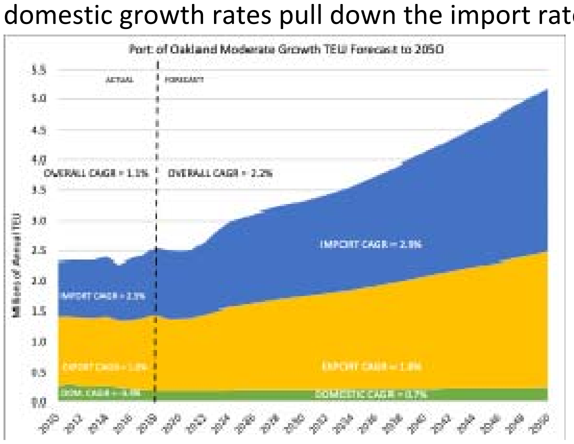
Catherine - Thanks!

Here are our concerns in a nutshell.

1. The proposed 4.6% CAGR for Oakland is far higher than what we have forecast, or what we are seeing in the industry. We are at 2.2% for the moderate growth case, as shown below.



This forecast is built up of separate import, export, empty, and domestic forecasts. The much slower export and domestic growth rates pull down the import rate to the 2.2% overall CAGR.



2. The international vessel mix at Oakland must be basically the same as at LALB because the vessel almost invariably call at LALB first and then come up to Oakland. You can see this in any of the AIS or Marine Exchange data, or on the carrier's vessel schedules. For example:

http://www.cma-cgm.com/products-services/line-services/flyer/JDX

https://www.cma-cgm.com/products-services/line-services/flyer/CALFB

We would be glad to go over any details.

Best,

Daniel Smith
Principal, The Tioga Group, Inc.
288 Rheem Blvd, Moraga, CA 94556
925-631-0742 dsmith@tiogagroup.com

From: Catherine Mukai <cmukai@portoakland.com>
Date: Thursday, June 13, 2019 at 10:49 AM
To: Michael Murphy <MMurphy@baaqmd.gov>, Phil Martien <PMartien@baaqmd.gov>, "eyura@baaqmd.gov" <eyura@baaqmd.gov>, "David M. Holstius" <dholstius@baaqmd.gov>, Henry Hilken <HHilken@baaqmd.gov>, "Pournazeri, Sam (sam.pournazeri@arb.ca.gov)" <sam.pournazeri@arb.ca.gov>, "david.phong@arb.ca.gov" <david.phong@arb.ca.gov>, "bonnie.soriano@arb.ca.gov" <bonnie.soriano@arb.ca.gov>, "Parmer, Cory@ARB" <Cory.Parmer@arb.ca.gov>, "Foster, Jonathan@ARB" <Jonathan.Foster@arb.ca.gov>, "Furey, Russell@ARB" <Russell.Furey@arb.ca.gov>, "Scourtis, Linda@BCDC" <linda.scourtis@bcdc.ca.gov>, Daniel Smith <dsmith@tiogagroup.com>, Daniel Hackett <daniel@hackettassociates.com>, Delphine Prevost <dprevost@portoakland.com>, Diane Heinze <dheinze@portoakland.com>, Tracy Fidell <tfidell@portoakland.com>
Subject: BAAQMD/ARB/BCDC/Port 6/11 call notes

Hello everyone,

Here are my notes from our call on Tuesday 6/11. Please let us all know if you have any edits.

Cory, can you send us all the link to the exact FAF 4.3.1 information you are using for Oakland? You mentioned there is an FAF table of growth rates corresponding to the figure at the top of page 28 of the January 2019 ARB OGV inventory.

BAAQMD	CARB	BCDC	Port
Michael Murphy Phil Martien Elizabeth Yura David Holstius Henry Hilken	David Phong Sam Pournazeri Bonnie Soriano Cory Parmer Jonathan Foster Russell Fury One other? We missed your name.	Linda Scourtis Dan Smith, Tioga Daniel Hackett, Hackett & Assoc. (sub to Tioga)	Delphine Prevost Tracy Fidell Catherine Mukai Diane Heinze

1. Port summary of how it projects Port growth rates and for what purpose (Delphine)
    a. The Port makes annual forecasts for revenue budgeting purposes. March 2019 forecast was FY2020 +5 operating years. In recent years, 0-2% TEU growth (full plus empty boxes) based on 10-year trend, 2-year trend, customer feedback, macro-economic factors, tariffs. No growth in vessel calls. The Port's Budget Book, which is online, contains these forecasts.

   b. Port also does periodic forecasts for land use and leasing studies, projects 1-3% growth. Base case of 3%, what-if case of 5%, but dropped the unrealistic 5% case. Even 3% is unrealistic for the near term. Latest study was in 2016 with a small refresh in 2017. 2016-2017 materials presented to Board.

2. BCDC summary of projected growth rates for Seaport Plan Amendments.
   a. Linda and Dan Smith shared background on BCDC's Seaport Plan and the study currently underway. The new study will be publicly available in draft form Monday 6/17. BCDC's charter is to make sure the Bay Area has sufficient seaport capacity for trade and commerce (not private terminals up the delta, not private refineries).
   b. Study looks at loaded imports/exports, empty imports/exports, domestic and international. Low, medium, and strong growth cases.
   c. Tariff and trade predictions make the next couple of years the least certain. Domestic trade at Oakland trending down due to market share shifts.
   d. Tioga's current estimate for Oakland container cargo is 2.2% annual growth.
   e. Daniel Hackett on basis for container forecasts:
      i. The base forecasts for imports are based on actual quarterly volumes from 2010 onwards incorporating SF growth spurt, national industrial production, GDP, industrial output. For exports, the cause of the recent downward trend had to go back further—quarterly actuals since 1998. Different factors from GDP and industrial production being forecast out. Inputs from Moody's to 2048 drive the model, then extrapolate to 2050. Vessel adjustments done with growth factors then adding in TEU for first port of call. First port of call adjustment adds ~500 boxes per call, max 70,000 TEU/year.
      ii. Michael: Different growth rate for vessel visits and TEUs? Dan: Finishing berth analysis now. Vessels that call in Oakland are determined by the vessels that call at LA/LB. All international lines calling Oakland also go to SPBP. Growth rate for vessel size depends on SPBP import growth. Tioga used the low-growth Mercator forecast for vessel size.
   f. Daniel Hackett reviewed FAF data for dry bulk and decided against using the FAF projections because they didn't line up with recent year actual activity.
   g. Daniel Hackett: FAF projections for 2040 rely on four main types of cargo only, and don't anticipate changes, like China's recent ban on waste paper exports.
   h. Dan Smith: FAF data are multi-model but focus on highways. FAF data are not specific to or designed for waterborne cargo. Delphine: Macroeconomic trends are different from port-specific projections. The differences between international trade and domestic movement activity are important.
3. ARB summary of projected growth rates for at-berth rulemaking
   a. Cory: The base for forecasting is 2016 actual vessel visits and duration at port. ARB considered linear extrapolation, doing its own analysis, or using FHWA FAF. FAF is a regional multi-modal model by commodity. Bay Area growth for commodity types that travel by container is 4.6% CAGR. It's done for 5-year increments and the annual average is 4.6%.
   b. ARB didn't use FAF for SPBP because SPBP have the Mercator study. FAF vs. Mercator for SPBP showed no real difference between now and 2030 (forecast-to-forecast comparison). Dan asked if ARB has compared the FAF and Mercator projections to actual SPBP growth.
      i. ARB does not do forecasting, it relies on FHWA to review a variety of economic sources and make assumptions, and to compare its FAF forecasts to reality.
   c. Delphine: Oakland sees fewer vessels each year, which ARB should include in its assumptions.
   d. For drayage trucks, ARB uses the FAF growth rate. For non-port trucks, ARB does NOT use the FAF growth rate. For CHE, ARB used an exponential rate of port growth. For the 2020 CHE inventory, ARB will account for operational changes that may offset growth rate, but ARB will use the TEU growth rate from FAF.
4. Delphine: The Port's historic growth rates fluctuate, but looking back 10 or 20 years the CAGR does not approach 4.6%.
5. BAAQMD: BAAQMD will use ARB's forecasts for the 2024 and 2029 Health Risk Assessment for AB617. BAAQMD will work with ARB to identify an alternative case once the BCDC Plan is out, to bracket the growth.
6. BAAQMD's July AB617 HRA draft will include only the FAF growth projections case. By October 2019 BAAQMD may have an additional lower-growth forecast in the final HRA using BCDC's projections.
7. Diane: How do growth rates and emissions correlate? Phil: It depends on emission factors, so it's not one-to-one.
   a. We need a follow-up conversation on this. Can BAAQMD send emission factors for 2024 and 2029?
8. Michael suggests that this group reconvene in July.

Thanks,
Catherine

APPENDIX B

Emission Calculations

[This page intentionally left blank]

West Oakland Community Action Plan
Operational Emissions Summary

Baseline Emissions (ton/yr)

Source	ROG	CO	NOx	SOx	PM10	PM2.5	CO2e (MT)
Hoteling	0.25	0.67	8.24	0.43	0.23	0.20	597.26
Storage Piles	-	-	-	-	0.83	0.12	-
Total	0.25	0.67	8.24	0.43	1.05	0.33	597.26

Control Strategy Emissions (ton/yr)

Source	ROG	CO	NOx	SOx	PM10	PM2.5	CO2e
Hoteling - 80% Shore Power	0.07	0.37	2.01	0.22	0.10	0.09	579.52
Storage Piles - Full Enclosure	-	-	-	-	0.04	0.01	-
Total	0.07	0.37	2.01	0.22	0.14	0.09	579.52

Net Emissions (ton/yr)

Source	ROG	CO	NOx	SOx	PM10	PM2.5	CO2e
Hoteling	-0.18	-0.30	-6.23	-0.21	-0.13	-0.12	-17.74
Storage Piles	0.00	0.00	0.00	0.00	-0.79	-0.12	0.00
Total	-0.18	-0.30	-6.23	-0.21	-0.92	-0.23	-17.74

Note: Negative numbers indicate emission reductions.

Assumptions:

Hoteling emissions based on 100 days of hoteling. Hoteling emissions include aux engine and boilers.
Mitigated hoteling emissions based on 80% shore power and 20% aux engine untilization.
Storage piles based on five 100 foot diameter by 40 foot height conical piles.
Mitigated storage piles based on full enclosures (95% control) for each pile.

West Oakland Community Action Plan
Enclosure Construction Emission Summary

ACTIVITY	ROG	CO	NOx	SOx	PM10	PM2.5	CO2e (MT)
Peak Daily Emissions (lb/day)							
Construction of One Enclosure	2.43	24.78	23.37	0.07	2.59	1.57	2.32
Construction of Five Concurrent Enclosures	12.17	123.89	116.87	0.35	12.97	7.85	11.60
Total Emissions (tons)							
Construction of One Enclosure	0.06	0.69	0.50	0.00	0.04	0.03	75.07
Construction of Five Enclosure	0.32	3.47	2.48	0.01	0.18	0.16	375.35

Hoteling Emissions - No Shore Power
Marine Vessel Emissions

OGV Auxiliary Generator Usage per One-Way Transit

Activity	Auxiliary kW per Vessel [1]	Hours/ Transit	kW-Hrs/ Transit
Hoteling	210	24.00	5,040

Notes: (1) Port of Long Beach 2016 Emissions Inventory - Table 2.1 (Starcrest 2017)

OGV Auxiliary Boiler Usage per One-Way Transit

Activity	Boiler kW per Vessel [1]	Hours/ Transit	kW-Hrs/ Transit
Hoteling	109	24.00	2,616

Notes: (1) Port of Oakland 2015 Emissions Inventory - Page 30 Environ 2016)

Emission Factors for OGV

Engine Type	Assumed Fuel Type	Assumed Fuel Use Application	ROG	CO	NOx	SOx	PM10	PM2.5	CO2	CH4	N2O	Source
Main Propulsion Engine (g/kW-hr)												
OGV Main Engines	MGO (0.1% S)	All (CARB requir	0.60	1.40	17.00	0.40	0.32	0.29	589	0.0120	0.02900	(1,2)
Tugboat Main Engines												
(Medium Speed Diesel)	ULSD (15 ppm S	2007+Tier 3	0.70	5.50	5.85	0.01	0.13	0.13	652	0.0130	0.02900	(3,4)
Auxiliary Engine (g/kW-hr)												
OGV Auxiliary Engines	MGO (0.1% S)	All (CARB requir	0.40	1.10	13.80	0.47	0.32	0.29	686	0.0080	0.02900	(5)
Tugboat Auxiliary Engines												
(High Speed Diesel)	ULSD (15 ppm S	2007+Tier 3	1.00	5.29	5.97	0.01	0.19	0.19	652	0.0195	0.02900	(3,4)
Auxiliary Boiler (g/kW-hr)												
OGV Auxiliary Boilers	MGO (0.1% S)	All (current)	0.10	0.20	2.00	0.60	0.17	0.15	922	0.002	0.0750	(6)

Notes: (1) Port of Long Beach Air Emissions Inventory - 2013 - Table 2.5. (Starcrest 2014)
(2) Port of Long Beach Air Emissions Inventory - 2013 - Table 2.6. (Starcrest 2014)
(3) Port of San Diego TAMT DEIR Volume 2 Page 298 Tioga and Scout tugs.
(4) Sulfur based on 15 ppm.
(5) Port of Long Beach Air Emissions Inventory - 2013 - Table 2.10, 2.11. (Starcrest 2014)
(6) Port of Long Beach Air Emissions Inventory - 2013 - Table 2.14, 2.15.. (Starcrest 2014)

Total Emissions per Year - Combined

Project Scenario/Activity	ROG	CO	NOx	SOx	PM10	PM2.5	CO2(MT)	CH4(MT)	N2O(MT)	CO2e (MT)
Hoteling (Aux + Boiler) - lb/day	5.02	13.38	164.87	8.65	4.54	4.09	5.87	0.00	0.00	5.97
Annual Total - 100 Days of Hoteling (tons/yr)	**0.25**	**0.67**	**8.24**	**0.43**	**0.23**	**0.20**	**586.94**	**0.00**	**0.03**	**597.26**

Total Emissions per Day(g/visit) - Aux Engine

Project Scenario/Activity	ROG	CO	NOx	SOx	PM10	PM2.5	CO2	CH4	N2O	CO2e
Hoteling	2,016	5,544	69,552	2,352	1,613	1,462	3,457,440	40	146	3,502,004
Total	**2,016**	**5,544**	**69,552**	**2,352**	**1,613**	**1,462**	**3,457,440**	**40**	**146**	**3,502,004**

Total Emissions per Day (g/visit) - Boiler

Project Scenario/Activity	ROG	CO	NOx	SOx	PM10	PM2.5	CO2	CH4	N2O	CO2e
Hoteling	262	523	5,232	1,570	445	392	2,411,952	5	196	2,470,550
Total	**261.60**	**523.20**	**5,232.00**	**1,569.60**	**444.72**	**392.40**	**2,411,952.00**	**5.23**	**196.20**	**2,470,550**

Hoteling Emissions - Shore Power
Marine Vessel Emissions

OGV Auxiliary Generator Usage per One-Way Transit

Activity	Auxiliary kW per Vessel (1)	Hours/ Transit	kW-Hrs/ Transit
Hoteling - Assumes 4 hours of Non-Shore Power	210	4.00	840

Notes: (1) Port of Long Beach 2016 Emissions Inventory - Table 2.1 (Starcrest 2017)

OGV Auxiliary Boiler Usage per One-Way Transit

Activity	Boiler kW per Vessel (1)	Hours/ Transit	kW-Hrs/ Transit
Hoteling	109	24.00	2,616

Notes: (1) Port of Oakland 2015 Emissions Inventory - Page 30 Environ 2016)

Emission Factors for OGV

Engine Type	Assumed Fuel Type	Assumed Fuel Use Application	ROG	CO	NOx	SOx	PM10	PM2.5	CO2	CH4	N2O	Source
Main Propulsion Engine (g/kW-hr)												
OGV Main Engines	MGO (0.1% S)	All (CARB required)	0.60	1.40	17.00	0.40	0.32	0.29	589	0.0120	0.02900	(1,2)
Tugboat Main Engines												
(Medium Speed Diesel)	ULSD (15 ppm S)	2007+Tier 3	0.70	5.50	5.85	0.01	0.13	0.13	652	0.0130	0.02900	(3,4)
Auxiliary Engine (g/kW-hr)												
OGV Auxiliary Engines	MGO (0.1% S)	All (CARB required)	0.40	1.10	13.80	0.47	0.32	0.29	686	0.0080	0.02900	(5)
Tugboat Auxiliary Engines												
(High Speed Diesel)	ULSD (15 ppm S)	2007+Tier 3	1.00	5.29	5.97	0.01	0.19	0.19	652	0.0195	0.02900	(3,4)
Auxiliary Boiler (g/kW-hr)												
OGV Auxiliary Boilers	MGO (0.1% S)	All (current in-use fuel	0.10	0.20	2.00	0.60	0.17	0.15	922	0.002	0.0750	(6)

Notes: (1) Port of Long Beach Air Emissions Inventory - 2013 - Table 2.5. (Starcrest 2014)
(2) Port of Long Beach Air Emissions Inventory - 2013 - Table 2.6. (Starcrest 2014)
(3) Port of San Diego TAMT DEIR Volume 2 Page 298 Tioga and Scout tugs.
(4) Sulfur based on 15 ppm.
(5) Port of Long Beach Air Emissions Inventory - 2013 - Table 2.10, 2.11. (Starcrest 2014)
(6) Port of Long Beach Air Emissions Inventory - 2013 - Table 2.14, 2.15.. (Starcrest 2014)

Emission Factors Shore Power

Activity	Aux Power kW	Total Power kW-hr	ROG	CO	NOx	SOx	PM10	PM2.5	CO2	CH4	N2O	Source
Hoteling (g/kW-hr) - Assumes 20 hours of Shore Power	210	4200	0.01	0.45	0.35	0.02	0.04	0.04	652	0.0114	0.00110	(1)

(1) Updated GHG and Criteria Air Pollutant Emission Factors of the US Electric Generating Units in 2010 (Argonne National Lab, 2013). Table 2.

Total Emissions per Delivery (lb/visit) - Combined

Project Scenario/Activity	ROG	CO	NOx	SOx	PM10	PM2.5	CO2(MT)	CH4(MT)	N2O(MT)	CO2e (MT)
Hoteling (Aux + Boiler) - lb/day	1.42	7.32	40.29	4.48	1.93	1.76	5.73	0.00	0.00	5.80
Annual Total - 100 Days of Hoteling (tons/yr)	**0.07**	**0.37**	**2.01**	**0.22**	**0.10**	**0.09**	**572.66**	**0.01**	**0.02**	**579.52**

Total Emissions per One-way Trip (g/visit) - Aux Engine

Project Scenario/Activity	ROG	CO	NOx	SOx	PM10	PM2.5	CO2	CH4	N2O	CO2e
Hoteling - Aux	336	924	11,592	392	269	244	576,240	7	24	583,667
Hoteling - Shore Power	48	1,872	1,450	72	162	162	2,738,400	48	5	2,740,974
Total	**384**	**2,796**	**13,042**	**464**	**431**	**406**	**3,314,640**	**55**	**29**	**3,324,641**

Total Emissions per One-way Trip (g/visit) - Boiler

Project Scenario/Activity	ROG	CO	NOx	SOx	PM10	PM2.5	CO2	CH4	N2O	CO2e
Hoteling	262	523	5,232	1,570	445	392	2,411,952	5	196	2,470,550
Total	**261.60**	**523.20**	**5,232.00**	**1,569.60**	**444.72**	**392.40**	**2,411,952.00**	**5.23**	**196.20**	**2,470,550**

Wind Erosion of Pile Surfaces and Ground Areas Around Piles

$E_3 = k \Sigma P_i$

where, E_3 = Emission Factor g/day, Wind Erosion

k_2 = Particle Size Multiplier, 0.5 for PM10

Σ = Sum from 1 to N, N = number of disturbances per year

P_i = Erosion potential corresponding to the observed (or probable) fastest mile of wind for the ith period between disturbances (g/m^2)

Source: U.S. EPA AP-42, 13.2.5 Eq. (2)

Using the procedure outlined in U.S. EPA AP-42, Section 13.2.5, on page 13.2.5-5.

Step 1: Determine Threshold Friction Velocity (u_t) for erodible material from Table 13.2.5-2

u_t = 0.55 m/s

Step 2: Divide the exposed surface area into subareas of constant frequency of disturbance (N)

N = 365

Step 3: Tabulate fastest mile values (u^+) for each frequency of disturbance and correct them to 10 m (u^+_{10}) using Eq. 5

Review of the HARP met modeling data for the Oakland station shows the 99th percentile wind speed to be 23 miles/hr or 10.3 m/s.

$u^+ = u^+_{10}$ = 23.0 miles/hr or 10.3 m/s

Step 4: Convert fastest mile values (u+10) to equivalent friction (u*), taking into account the nonuniform wind exposure of elevated surfaces (piles) using Eq. 6 and Eq.7

From Table 13.2.5-4, using u^+_{10} = 23 miles/hr,

u* for (u_s/u_r=0.2) = 0.21 m/s

u* for (u_s/u_r=0.6) = 0.62 m/s

u* for (u_s/u_r=0.9) = 0.93 m/s

Step 5: For elevated surfaces (piles), subdivide areas of constant N into subareas of constant u* and determine the size of each subarea

From Table 13.2.5.3, for a conical pile (Pile A)

Pile Subarea	%	Area (m^2)
0.2a	5	85.988
0.2b	35	601.92
0.6a	48	825.49
0.9	12	206.37

Assume one conical pile with a maximum diameter of 100 ft and maximum height of 40 ft.

$A = \pi * r * (r^2 + h^2)^{0.5}$

A = 3704.72 ft^2 per pile

A = 18523.6 ft^2 Assumes 5 piles within region.

Step 6: For each subarea of constant N and u*, calculate the erosion potential (P_i) using Eq 3.

$P = 58 * (u^* - u_t^*)^2 + 24 * (u^* - u_t^*)$ and P= 0 for $u^* \leq u_t^*$

For 23 miles/hr, $u^* < u_t^*$ for pile subarea 0.2a. Therefore, only 0.9 and 0.6 P_i is calculated.

$P_{0.9+0.6}$ = $58(0.93 - 0.55)^2$ +25(0.93 - 0.55) + 58(0.62 - 0.55)2 +25(0.62 - 0.55)

$P_{0.9}$ = 19.9094 g/m^2

Step 7: Multiply the resulting emission factor for each subarea by the size of the subarea, and the sum for all subareas.

Since $P_{0.2}$ and $P_{0.6}$ = 0, $P = P_{0.9} * A_{0.9}$.

P = 19.9094 * 206.372

P = 4108.75 g/day

West Oakland Community Action Plan
Emission Reductions from Enclosures for Wind Blown Piles
PM10 Emission Estimate Calculations

Uncontrolled Emissions

$E_3 = k * \sum P_i$

$\mathbf{E_3}$ **=**	**4.53**	**lb/day**
$\mathbf{E_3}$ **=**	**0.83**	**ton/yr**

Full Enclosure Controlled Emissions

Enclosure Control Efficiency = 95 %, Source SCAQMD PAR 1158, Appendix C, page C-2.

$E_{3c} = E_3 * (1\text{-}0.95)$

$\mathbf{E_{3c}}$ **=**	**0.23**	**lb/day**
$\mathbf{E_3}$ **=**	**0.04**	**ton/yr**

3-Sided Enclosure Controlled Emissions

Enclosure Control Efficiency = 75 %, Source SCAQMD Mitigation Measure Examples Fugitive Dust From Storage Table XI-E.

$E_{3P} = E_3 * (1\text{-}0.75)$

$\mathbf{E_{3P}}$ **=**	**1.13**	**lb/day**
$\mathbf{E_3}$ **=**	**0.21**	**ton/yr**

References: U.S. EPA AP-42 Sections 13.2.4 (1/95), 13 U.S. EPA AP-42 Section 13.2.5 (1/95)

West Oakland Community Action Plan
Emission Reductions from Enclosures for Wind Blown Piles
PM2.5 Emission Estimate Calculations

Wind Erosion of Pile Surfaces and Ground Areas Around Piles

$E_3 = k \Sigma P_i$

where, E_3 = Emission Factor g/day, Wind Erosion

k_2 = Particle Size Multiplier, 0.075 for PM2.5

Σ = Sum from 1 to N, N = number of disturbances per year

P_i = Erosion potential corresponding to the observed (or probable) fastest mile of wind for the ith period between disturbances (g/m^2)

Source: U.S. EPA AP-42, 13.2.5 Eq. (2)

Using the procedure outlined in U.S. EPA AP-42, Section 13.2.5, on page 13.2.5-5.

Step 1: Determine Threshold Friction Velocity (u_t) for erodible material from Table 13.2.5-2

u_t = 0.55 m/s

Step 2: Divide the exposed surface area into subareas of constant frequency of disturbance (N)

N = 365

Step 3: Tabulate fastest mile values (u^+) for each frequency of disturbance and correct them to 10 m (u^+_{10}) using Eq. 5

Review of the HARP met modeling data for the Oakland station shows the 99th percentile wind speed to be 23 miles/hr or 10.3 m/s.

$u^+ = u^+_{10}$ = 23.0 miles/hr or 10.3 m/s

Step 4: Convert fastest mile values (u+10) to equivalent friction (u*), taking into account the nonuniform wind exposure of elevated surfaces (piles) using Eq. 6 and Eq.7

From Table 13.2.5-4, using u^+_{10} = 23 miles/hr,

u* for (u_s/u_r=0.2) = 0.21 m/s

u* for (u_s/u_r=0.6) = 0.62 m/s

u* for (u_s/u_r=0.9) = 0.93 m/s

Step 5: For elevated surfaces (piles), subdivide areas of constant N into subareas of constant u* and determine the size of each subarea

From Table 13.2.5.3, for a conical pile (Pile A)

Pile Subarea	%	Area (m^2)
0.2a	5	85.988
0.2b	35	601.92
0.6a	48	825.49
0.9	12	206.37

Assume one conical pile with a maximum diameter of 100 ft and maximum height of 40 ft.

$A = \pi * r * (r^2 + h^2)^{0.5}$

A = 3704.72 ft^2 per pile

A = 18523.6 ft^2 Assumes 5 piles within the region.

Step 6: For each subarea of constant N and u*, calculate the erosion potential (P_i) using Eq 3.

$P = 58 * (u^* - u_t^*)^2 + 24 * (u^* - u_t^*)$ and P= 0 for $u^* \leq u_t^*$

For 23 miles/hr, $u^* < u_t^*$ for pile subarea 0.2a. Therefore, only 0.9 and 0.6 P_i is calculated.

$P_{0.9+0.6}$ = $58(0.93 - 0.55)^2$ +25(0.93 - 0.55) + 58(0.62 - 0.55)2 +25(0.62 - 0.55)

$P_{0.9}$ = 19.9094 g/m^2

Step 7: Multiply the resulting emission factor for each subarea by the size of the subarea, and the sum for all subareas.

Since $P_{0.2}$ and $P_{0.6} = 0$, $P = P_{0.9} * A_{0.9}$.

P = 19.9094 * 206.372

P = 4108.75 g/day

West Oakland Community Action Plan
Emission Reductions from Enclosures for Wind Blown Piles
PM2.5 Emission Estimate Calculations

Uncontrolled Emissions

$E_3 = k * \Sigma P_i$

E_3 = 0.68 lb/day

E_3 = 0.12 ton/yr

Full Enclosure Controlled Emissions

Enclosure Control Efficiency = 95 %, Source SCAQMD PAR 1158, Appendix C, page C-2.

$E_{3c} = E_3 * (1-0.95)$

E_{3c} = 0.03 lb/day

E_3 = 0.01 ton/yr

3-Sided Enclosure Controlled Emissions

Enclosure Control Efficiency = 75 %, Source SCAQMD Mitigation Measure Examples Fugitive Dust From Storage Table XI-E.

$E_{3P} = E_3 * (1-0.75)$

E_{3P} = 0.17 lb/day

E_3 = 0.03 ton/yr

References: U.S. EPA AP-42 Sections 13.2.4 (1/95), 13 U.S. EPA AP-42 Section 13.2.5 (1/95)

West Oakland Community Action Plan
Operational Delivery Truck Emissions

Equipment	Vehicle	Trip Length	Annual Trips	VMT	VOC	CO	Nox	SOx	Mobile PM10	Fugitive PM10	Total PM10	Total PM2.5	CO2e
Emission Factor (lb/mi)	HHDT	100	40	4000	0.00035	0.00231	0.01078	0.00004	0.00027	0.00231	0.00258	0.001	3.745
Annual Emissions (lb/yr)					1.409	9.232	43.108	0.140	1.067	9.257	10.325	2.641	14981.074
Annual Emissions (tons/yr)(MT/yr for CO2e)					**0.001**	**0.005**	**0.022**	**0.000**	**0.001**	**0.005**	**0.005**	**0.001**	**6.795**
Average Daily (lb/day)					**0.004**	**0.025**	**0.118**	**0.000**	**0.003**	**0.025**	**0.028**	**0.007**	**41.044**
Peak Daily (lb/day)					**0.070**	**0.462**	**2.155**	**0.007**	**0.053**	**0.463**	**0.516**	**0.132**	**749.054**

Notes:

(1) Peak day assumes 2 ammonia or catalyst delivery trucks.

(2) Emfac2014 emission factors for the San Francisco Bay Area District for 2019 fleet. Total PM2.5 = Mobile PM10 + 0.17*Fugitive PM10.

(3) Fugitive PM emission calculations for travel on paved roads from EPA AP-42 Section 13.2.1, January 2011

$E = k(sL)^{0.91} \times (W)^{1.02}$

Where: k = 0.0022 lb/VMT for PM10, sL = road silt loading (gms/m2)
(0.03 for major/collector roads), W = weight of vehicles (2.5 tons for light; 5.5 for medium trucks,
and 24 for heavy trucks)

(4) Carbon Dioxide Equivalence (CO2e) = $CO_2 + CH_4 * 21 + N2O*310$

where CO2 emissions factors are from Emfac2011. CH4 and N2O emissions factors are from Direct Emissions from Mobile Combustion Sources, EPA 2008.

where light vehicle are gasoline light duty trucks.

where medium/heavy duty vehicle are diesel heavy duty trucks.

Chemical	2019 Light	2019 Medium	2019 Heavy
CO2 (lb/mi)	0.8949	2.2430	3.7418
CH4 (g/mi)	0.0148	0.0051	0.0051
N2O (g/mi)	0.0157	0.0048	0.0048
CO2e (lb/mi)	0.906	2.247	3.745

West Oakland Community Action Plan
Operational Onroad Vehicle Emissions

Emissions Factors	Type	Fuel	VOC	CO	NOx	SOx	PM10	PM2.5	CO2e
Emission Factor (lb/vehicle-yr)	LDA	Gas/Dsl	2.54E+01	1.31E+02	1.90E+01	5.39E-02	9.69E-01	6.03E-01	5.21E+03
Emission Factor (lb/vehicle-yr)	LDA	Elec	4.10E-02	0.00E+00	0.00E+00	0.00E+00	2.26E+00	8.96E-01	2.16E+03

Gas/Diesel Vehicles Emissions

Program	Units	Vehicle	VOC	CO	NOx	SOx	PM10	PM2.5	CO2e (MT/yr)
Vehicle Buy Back	lb/yr	60	1521.11	7870.85	1142.65	3.24	58.11	36.20	141.78
Vehicle Buy Back	lb/yr	80	2028.15	10494.47	1523.54	4.32	77.48	48.27	189.04
Cleaner Cars for All	lb/yr	40	1014.07	5247.24	761.77	2.16	38.74	24.13	94.52
Cleaner Cars for All	lb/yr	50	1267.59	6559.05	952.21	2.70	48.43	30.17	118.15

Electric Vehicles Emissions

Program	Units	Vehicle	VOC	CO	NOx	SOx	PM10	PM2.5	CO2e (MT/yr)
Vehicle Buy Back	lb/yr	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Vehicle Buy Back	lb/yr	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Cleaner Cars for All	lb/yr	40	1.64	0.00	0.00	0.00	90.31	35.82	39.10
Cleaner Cars for All	lb/yr	50	2.05	0.00	0.00	0.00	112.89	44.78	48.88

Net Vehicles Emissions

Program	Units	Vehicle	VOC	CO	NOx	SOx	PM10	PM2.5	CO2e (MT/time)
Vehicle Buy Back	lb/day	60	-4.17	-21.56	-3.13	-0.01	-0.16	-0.10	-0.39
Vehicle Buy Back	lb/day	80	-5.56	-28.75	-4.17	-0.01	-0.21	-0.13	-0.52
Cleaner Cars for All	lb/day	40	-2.77	-14.38	-2.09	-0.01	0.14	0.03	-0.15
Cleaner Cars for All	lb/day	50	-3.47	-17.97	-2.61	-0.01	0.18	0.04	-0.19
Vehicle Buy Back	tons/yr	60	-0.76	-3.94	-0.57	0.00	-0.03	-0.02	-141.78
Vehicle Buy Back	tons/yr	80	-1.01	-5.25	-0.76	0.00	-0.04	-0.02	-189.04
Cleaner Cars for All	tons/yr	40	-0.51	-2.62	-0.38	0.00	0.03	0.01	-55.42
Cleaner Cars for All	tons/yr	50	-0.63	-3.28	-0.48	0.00	0.03	0.01	-69.28

Notes:

Emfac2014 emission factors for the San Francisco Bay Area District for 2019 fleet. Assumes 1975-1996 fleet for gas/diesel and 2019 for electric.

CO2e factors from U.S. Department of Energy for California. https://afdc.energy.gov/vehicles/electric_emissions.html. Accessed 6-28-19.

West Oakland Community Action Plan
Operational Onroad Vehicle Fuel Use

Emissions Factors	Type	Fuel	Fuel
Emission Factor (gal/vehicle-yr)	LDA	Gas/Dsl	2.83E+02
Emission Factor (gal/vehicle-yr)	LDA	Elec	0.00E+00

Gas/Diesel Vehicles Fuel Use

Program	Units	Vehicle	Fuel
Vehicle Buy Back	gal/yr	60	16963.43
Vehicle Buy Back	gal/yr	80	22617.91
Cleaner Cars for All	gal/yr	40	11308.96
Cleaner Cars for All	gal/yr	50	14136.20

Electric Vehicles Fuel Use

Program	Units	Vehicle	Fuel
Vehicle Buy Back	gal/yr	0	0.00
Vehicle Buy Back	gal/yr	0	0.00
Cleaner Cars for All	gal/yr	40	0.00
Cleaner Cars for All	gal/yr	50	0.00

Net Vehicles Emissions

Program	Units	Vehicle	Fuel
Vehicle Buy Back	gal/day	60	-46.48
Vehicle Buy Back	gal/day	80	-61.97
Cleaner Cars for All	gal/day	40	-30.98
Cleaner Cars for All	gal/day	50	-38.73
Vehicle Buy Back	gal/yr	60	-16963.43
Vehicle Buy Back	gal/yr	80	-22617.91
Cleaner Cars for All	gal/yr	40	-11308.96
Cleaner Cars for All	gal/yr	50	-14136.20

Notes:

Emfac2014 emission factors for the San Francisco Bay Area District for 2019 fleet. Assumes 1975-1996 fleet for gas/diesel and 2019 for electric.

CO2e factors from U.S. Department of Energy for California. https://afdc.energy.gov/vehicles/electric_emissions.html. Accessed 6-28-19.

West Oakland Community Action Plan
Enclosure Off-road Construction Emissions

Phase	Equipment	HP	Amount	Days	Hr/Day	Total Hours	Emission Factors (lb/hr)						Emissions (lb)						
							VOC	CO	NOx	SOx	PM10	CO2e	VOC	CO	NOx	SOx	PM10	PM2.5	CO2e (MT)
Equipment Installation	Air Compressor	Comp	1	60	8	480	0.02	0.21	0.13	0.00	0.01	0.01	10.93	99.76	61.01	0.14	4.74	4.70	3.40
Equipment Installation	Crane	Comp	1	60	4	240	0.05	0.40	0.72	0.00	0.03	0.04	12.61	95.56	173.84	0.35	8.01	7.93	8.49
Equipment Installation	Forklift	Comp	1	60	8	480	0.02	0.22	0.17	0.00	0.01	0.01	8.02	103.97	83.37	0.19	5.96	5.90	4.60
Equipment Installation	Generator Sets	50	2	60	8	960	0.02	0.28	0.13	0.00	0.01	0.01	21.87	269.92	122.02	0.28	9.49	9.39	6.81
Equipment Installation	Aerial Lift	Comp	4	60	8	1920	0.00	0.17	0.10	0.00	0.00	0.01	9.12	329.29	187.93	0.85	3.73	3.70	20.46
Equipment Installation	Welder	50	4	60	8	1920	0.03	0.23	0.18	0.00	0.02	0.01	63.62	436.11	347.73	0.75	29.23	28.94	17.99
Emissions for One Enclosure Construction (tons)													**0.06**	**0.67**	**0.49**	**0.00**	**0.03**	**0.03**	**61.75**
Peak Daily Emissions (lb/day)													**2.10**	**22.24**	**16.27**	**0.04**	**1.02**	**1.01**	**1.03**

Notes:

(1) Off-Road 2011 for 2019 fleet. CO emissions from SCAQMD, 2006 : http://www.aqmd.gov/ceqa/handbook/offroad/offroadEF07_25.xls

(2) Carbon Dioxide Equivalents (CO2e) are based on fuel use and default emission factors for diesel. Metric tons.

West Oakland Community Action Plan
Enclosure On-road Construction Emissions

Phase	Vehicle	Trip Length	Total Trips	VMT	VOC (lb/mi)	CO (lb/mi)	NOx (lb/mi)	SOx (lb/mi)	PM (lb/mi)	Fugitive PM	CO2e (lb/mile)	VOC (lbs)	CO (lbs)	NOx (lbs)	SOx (lbs)	PM10 (lbs)	PM2.5 (lbs)	CO2e (tonnes)
Equipment Installation	Commuters	24.8	1200	29760	0.000	0.002	0.000	0.000	0.000	0.000	0.906	1.278	51.209	8.229	0.211	9.752	4.292	12.234
Equipment Installation	Delivery	40	10	400	0.000	0.002	0.007	0.000	0.000	0.000	2.247	0.169	0.758	2.662	0.010	0.379	0.224	0.408
Equipment Installation	HHDT	40	10	400	0.000	0.002	0.011	0.000	0.000	0.002	3.745	0.141	0.923	4.311	0.014	1.032	0.264	0.680
Emissions for One Enclosure Construction (Total Emissions)												**0.001**	**0.026**	**0.008**	**0.000**	**0.006**	**0.002**	**13.322**
Emissions for One Enclosure Construction (Peak Daily)												**0.331**	**2.535**	**7.110**	**0.028**	**1.574**	**0.560**	**1.291**

Notes:

(1) Peak day assumes 20 workers per day and all deliverise occur in one day. Project emissions based on 20 commuters per day for 60 days.

(2) Emfac2014 emission factors for the San Francisco Bay Area District for 2019 fleet.

(3) Fugitive PM emission calculations for travel on paved roads from EPA AP-42 Section 13.2.1, January 2011

$E = k(sL)^{0.91} \times (W)^{1.02}$

Where: k = 0.0022 lb/VMT for PM10, sL = road silt loading (gms/m2)

(0.03 for major/collector roads), W = weight of vehicles (2.5 tons for light; 5.5 for medium trucks, and 24 for heavy trucks)

(4) Carbon Dioxide Equivalence (CO_E) = CO_2 + CH_4 * 21 + N2O*310

where CO2 emissions factors are from Emfac2011. CH4 and N2O emissions factors are from Direct Emissions from Mobile Combustion Sources, EPA 2008.

where light vehicle are gasoline light duty trucks.

where medium/heavy duty vehicle are diesel heavy duty trucks.

Chemical	2019 Light	2019 Medium	2019 Heavy
CO2 (lb/mi)	0.8949	2.2430	3.7418
CH4 (g/mi)	0.0148	0.0051	0.0051
N2O (g/mi)	0.0157	0.0048	0.0048
CO2e (lb/mi)	0.906	2.247	3.745

Appendix C:

AB 617 Owning Our Air: The West Oakland Community Action Plan
Technical Support Document
Base Year Emissions Inventory and Air Pollutant Dispersion Modeling

This page intentionally left blank.

Table of Contents

Notation

Acronyms

AADT	annual average daily traffic
AB	Assembly Bill
ABAG	Association of Bay Area Governments
AERMAP	American Meteorological Society/Environmental Protection Agency Regulatory Model terrain pre-processor
AERMET	American Meteorological Society/Environmental Protection Agency Regulatory Model Meteorological Processor
AERMOD	American Meteorological Society/Environmental Protection Agency Regulatory Model
agl	above ground level
APCS	automated pavement condition survey
ASF	age sensitivity factor
asl	above sea level
AQS	Air Quality System
BAAQMD	Bay Area Air Quality Management District
BAU	business-as-usual
CalEPA	California Environmental Protection Agency
CAPCOA	California Air Pollution Control Officers Association
CAPP	Community Air Protection Program
CARB	California Air Resources Board
CARE	Community Air Risk Evaluation
CAS	Chemical Abstract Service
CEIDARS	California Emissions Inventory Development and Reporting System
CHC	commercial harbor craft
CHE	cargo handling equipment
CHEI	Cargo Handling Equipment Inventory (model)
CMAQ	Community Multi-scale Air Quality (model)
CPF	cancer potency factor
CT-EMFAC	Caltrans-EMissions FACtors (model)
DBR	daily breathing rate
DPM	diesel particulate matter
EBMUD	East Bay Municipal Utility District
EC	elemental carbon
ED	exposure duration
EDF	Environmental Defense Fund
EMFAC	EMission FACtors (model)
EPA	Environmental Protection Agency
EZ	exclusion zone
FAH	fraction of time at home
FHWA	U.S. Federal Highway Administration
GVWR	gross vehicle weight rating
HDV	heavy-duty vehicle

HHDT	heavy heavy-duty truck
HRA	health risk assessment
IDW	inverse distance weighting
LDV	light-duty vehicle
LHDT	light heavy-duty truck
LST	local standard time
MSAT	mobile source air toxic
MDV	medium-duty vehicle
MHDT	medium heavy-duty truck
NAD83	North American Datum of 1983
NEI	National Emissions Inventory
NEPA	National Environmental Policy Act
NOAA	National Oceanic and Atmospheric Administration
NT	Non-Truck
OEHHA	Office of Environmental Health Hazard Assessment
OGV	ocean-going vessel
O&M	operation and maintenance
O-D	origin-destination
PeMS	Performance Measurement System
PM	particulate matter
PM_{10}	particulate matter 10 micrometers or less in diameter
$PM_{2.5}$	particulate matter 2.5 micrometers or less in diameter
POM	polycyclic organic matter
POAK	Port of Oakland
PSD	prevention of significant deterioration
QA	quality assure/assurance
SIC	Standard Industrial Classification
SMOKE	Sparse Matrix Operator Kernel Emissions (model)
SRTM	Shuttle Radar Topography Mission
TAC	toxic air contaminants
TIGER	Topographically Integrated Geographic Encoding and Referencing
TOG	total organic gases
T1	Truck 1
T2	Truck 2
UP	Union Pacific
USGS	United States Geological Survey
UTM	Universal Transverse Mercator
VHT	vehicle hours traveled
VMT	vehicle miles traveled
WD	weekday
WE	weekend
WETA	Water Emergency Transportation Authority
WOEIP	West Oakland Environmental Indicators Project
WRF	Weather Research and Forecasting (model)

Units

g	gram
kg	kilogram
lb	pound
mg	milligram
ton	U.S. ton (2,000 lb)
tpy	tons per year (U.S. ton/y)
µg	microgram
L	liter
gal	gallon
ft	feet
nmi	nautical mile
m	meter
mi	mile
h	hour
min	minute
s	second
mph	miles per hour (mi/h)
kt	knot (1.15078 mph)
°C	degrees Celsius
°F	degrees Fahrenheit
K	Kelvin
ppm	parts per million
bhp	brake horsepower
hp	horsepower
kW	kilowatt

1. Introduction

The California State Assembly adopted Assembly Bill (AB) 617 in 2017 (C. Garcia, Chapter 136, Statutes of 2017). The bill established the Community Air Protection Program (CAPP), which focuses on reducing exposure in communities most impacted by air pollution. Local air districts are tasked with partnering with community groups, environmental organizations, regulated communities, and other stakeholders to develop a new community-focused action framework for community protection.

1.1 Context

The Bay Area Air Quality Management District (BAAQMD, "the District") identified West Oakland as its first-year community under the CAPP. West Oakland is bounded by three major freeways (I-580, I-880, I-980), is adjacent to large industrial sources and the Port of Oakland ("the Port"), and is the location of a major U.S. Postal Service Distribution Center (Figure 1-1). Based on modeling and field studies conducted under the District's Community Air Risk Evaluation Program (CARE), the District identified West Oakland as a community impacted by poor air quality (elevated fine particulate matter), where residence have poor health outcomes and are subjected to elevated cancer risk.[1]

The technical work performed to support the West Oakland Community Action Plan ("Action Plan") pursuant to AB 617 is described in this document. The objective of this technical work was to spatially map the contribution of emissions from major emissions sources to pollutant concentrations within the community that may potentially impact current and future residents in West Oakland. To identify areas with elevated air pollutant concentrations and higher population exposure, a bottom-up air pollutant *emissions inventory* was developed, and *air pollution dispersion modeling* was performed to support a *source apportionment* analysis. This document therefore describes how emissions from major source categories were estimated, how the dispersion model was selected and configured, and how output from the dispersion model was used.

Emissions inventories contain information on the quantity of air pollutants that are emitted from specific sources or source categories over a specific period. In this analysis, emissions inventories of fine particulate matter (particulate matter 2.5 micrometers or less in diameter [$PM_{2.5}$]) and toxic air contaminants (TACs) that have documented cancer toxicities (see Attachment 1) were developed. The emissions inventory accounts for *primary pollutants* only.[2]

[1] Previous analyses (Bay Area Air Quality Management District 2014) identified impacted areas based on elevated fine particulate matter concentrations and high rates of cancer, incidences of mortality, hospitalization rates, and respiratory illnesses.

[2] Primary pollutants are those compounds emitted directly into the atmosphere. In dispersion modeling, primary pollutants are also assumed to be nonreactive. *Secondary pollutants* (compounds formed in the atmosphere as a result of chemical reactions) were not included in this analysis because (1) their formation involves complex chemical reactions that cannot be accounted for in the dispersion models, and (2) near-source exposures tend to be driven by emissions of primary pollutants; secondary pollutants form downwind of sources and tend to be distributed at a regional scale.

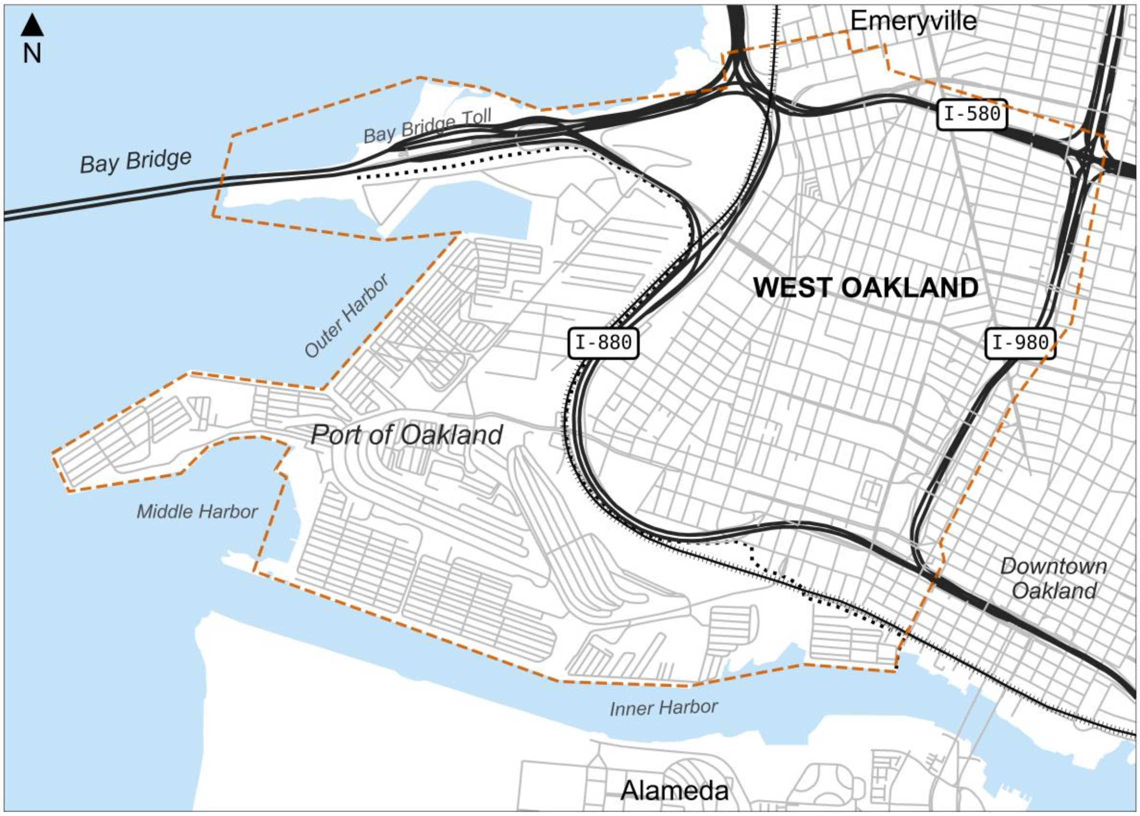


Figure 1-1. Map of the West Oakland community. The extents of West Oakland (dashed red line) and the Port of Oakland (dotted black line), roadways (solid black and grey lines) and rail lines (hatched black lines) are denoted.

The inventory includes emissions from: permitted stationary sources (small and large complex facilities regulated by the District), on-road mobile sources (vehicles on all surface streets and freeways, and extended idling from trucks operating at certain large businesses), marine operations and railyard activity at the Port, locomotives, and commuter ferries and excursion vessels. $PM_{2.5}$ and TACs are the primary air pollutants which pose the greatest risk to the health of residents in West Oakland and are further described below.

Toxic Air Contaminants (TACs): The California Air Resources Board (CARB) is responsible for identifying TACs, which are defined as pollutants that "may cause or contribute to an increase in deaths or in serious illness, or which may pose a present or potential hazard to human health."[3] Exposure to TACs can cause serious health effects, including cancer and birth defects. Other adverse health effects can include damage to the immune, neurological, reproductive (reduced fertility), developmental, and respiratory systems. TACs are emitted from many sources in the Bay Area, including from: diesel engines, vehicles (e.g., cars, trucks), industrial processes, and gas stations. Types of TACs include diesel particulate matter (DPM), lead, benzene, formaldehyde, and hexavalent

[3] https://ww2.arb.ca.gov/about/glossary (accessed January 2019).

chromium (a complete list of TACs examined in this analysis is provided in Attachment 1). DPM is the most significant TAC in the Bay Area, accounting for ~85% of the cancer risk.

Fine Particulate Matter ($PM_{2.5}$): $PM_{2.5}$ originates from a variety of sources, including fossil fuel combustion, residential wood burning and cooking, and natural sources (such as wildfires and re-entrained road dust). Epidemiological studies have established that exposure to $PM_{2.5}$ has serious adverse health impacts (e.g., Cohen and Pope 1995, Krewski *et al.* 2009, Health Effects Institute 2010). $PM_{2.5}$ can enter deep into lungs and the bloodstream. Exposure to $PM_{2.5}$ has negative effects on the respiratory system (such as triggering asthma attacks, aggravating bronchitis, and diminishing lung function), cardiovascular system (and may cause atherosclerosis [hardening of the arteries], ischemic strokes [cause by an obstruction of the blood supply to the brain], and heart attacks). Because of the serious cardiovascular effects of exposure to $PM_{2.5}$, studies have found a clear correlation between exposure to elevated $PM_{2.5}$ levels and mortality. Studies also indicate that exposure to $PM_{2.5}$ may be related to other negative health effects, including impacts on the brain, such as reduced cognitive function, as well as increased risk of diabetes. Exposure to $PM_{2.5}$ remains the leading public health risk and contributor to premature death from air pollution in the Bay Area. More information on fine PM and associated health effects can be found in the report *Understanding Particulate Matter: Protecting public health in the San Francisco Bay Area*, prepared by the District (Bay Area Air Quality Management District 2012).

Emissions inventories were developed for three years: a base (“current”) year (effective 2017), and a forecasted near-term future year (2024), and a far-term future year (2029). The base year is used to establish initial concentrations where mitigation strategies may be developed to reduce future-year exposures. The future-year emissions inventories include anticipated reductions from existing regulations and known changes in source activity (*business-as-usual*; BAU); additional anticipated reductions from presumed implementation of proposed mitigation measures under this Action Plan were also included (within the Action Plan) to show where high levels of air pollution may persist, and additional actions may be warranted. The base-year emissions inventory is further described in this document (Section 2); forecasted future-year emissions inventories are described in Part II of this documentation.

Air pollutant concentrations at a *receptor* (a location where concentrations are measured) represent the sum of all concentration contributions from many emissions *sources*; that is, the total concentrations at a receptor can be *apportioned* to different sources. From a spatiotemporal perspective, concentrations at a receptor also represent the sum of concentrations due to local sources and those of regional sources. Accordingly, two modeling analyses were performed:

(1) “Regional-scale modeling” was used to provide an estimate of the “background” pollutant concentrations, i.e., the air pollutant concentrations in West Oakland in the absence of any local emission sources in West Oakland. Concentrations were simulated pollutant concentrations within 1 km grid cells over the entire Bay Area. This was performed using a modeling framework consisting of a numerical meteorological model (Weather Research and Forecasting [WRF] model), an emissions inventory model (Sparse Matrix Operator Kerner Emissions [SMOKE] modeling system), and a chemical transport model (Community Multiscale Air Quality [CMAQ] modeling system), where

emissions sources within West Oakland were excluded. The regional-scale modeling was also evaluated using the concentrations from local air quality monitors.

(2) "Community-scale modeling" was used to quantify the local impacts from emissions sources on air pollutant concentrations in West Oakland at a finer spatial scale. Dispersion factors were generated using the American Meteorological Society/ Environmental Protection Agency Regulatory Model (AERMOD) system with a single year of representative meteorological data (2014). Dispersion models use a time-averaged, simplified representation of turbulent atmospheric dispersion to approximate how pollutants are transported and diluted. Critical inputs to the dispersion models are estimates of emissions from major air pollution sources and source characteristics. Year-specific emissions inventories were then convolved with the dispersion factors to obtain year-specific air pollutant concentrations for the West Oakland community.

The approach is that the results of the AERMOD dispersion modeling, which only accounts for local emissions sources, when added to the background concentration from the regional modeling, will result in a concentration that approaches the total concentration (Figure 1-2).[4] The results from the dispersion modeling can also be thought of as the "additional burden" caused by the emissions in West Oakland alone. The community-scale modeling using AERMOD is further described in this document (Section 3); the regional-scale modeling is briefly described herein (Section 3.6), and fully documented elsewhere (Tanrikulu *et al.* 2019a, Tanrikulu *et al.* 2019b).

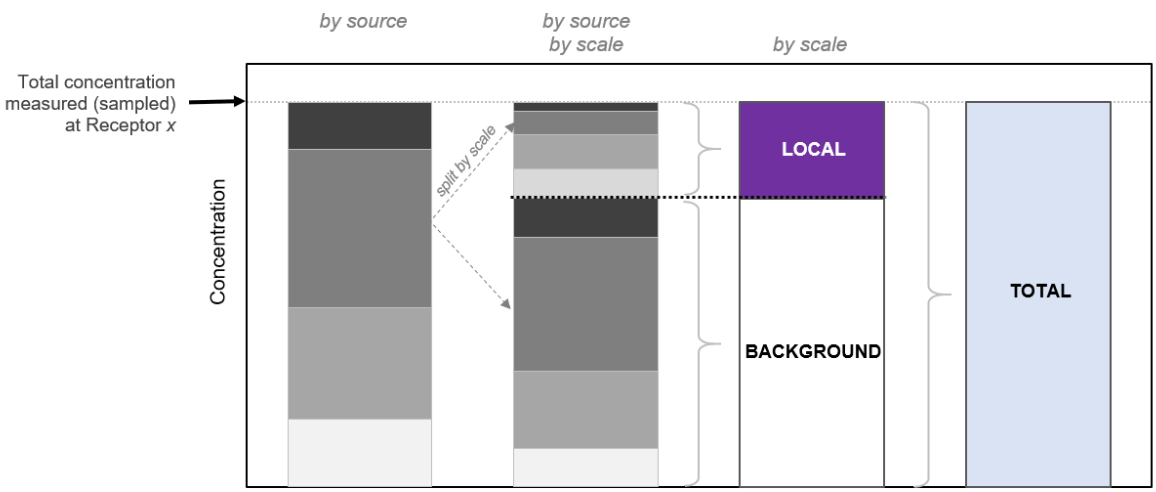


Figure 1-2. Schematic representation of how concentration contributions are disaggregated in a source apportionment analysis. Grey bar sections represent the concentration contributions from different arbitrary source categories.

[4] A model evaluation can be performed by comparing the total concentration to those observed at monitoring locations within the same domain. This analysis is not discussed in this document.

1.2 Objectives

The District, in partnership with the West Oakland Environmental Indicators Project (WOEIP), developed an Action Plan for West Oakland to promote innovative policies to improve air quality. The objective of this technical work was to understand the spatial distribution of pollutant concentrations in West Oakland due to local emissions sources. Collaboration with WOEIP helped the District identify specific goals and action-oriented strategies for West Oakland that will focus on reducing exposure to $PM_{2.5}$, DPM, and TACs. To assist with this effort, the District initiated a community-scale modeling analysis to:

- Develop a base year emissions inventory and risk assessment for all major emissions sources impacting West Oakland residents;
- Provide source apportionment of concentrations at receptors by source category (i.e., trucks, ships, rail, etc.) or source origin (e.g., Port of Oakland, Union Pacific rail, etc.);
- Establish a baseline to track the benefits of future emission reductions on the burden of future new emissions sources.
- Develop a framework for modifying and expanding the emissions inventory for local emissions sources.

In this analysis, an emissions inventory was developed (Section 2), air dispersion modeling was performed (Section 3), and pollutant concentrations and cancer risk estimates were generated (Section 4). A brief overview of the results (Section 5), and a discussion of sources of uncertainty in the methods (Section 6) are also presented.

2. Emissions Inventory

The District developed bottom-up emissions inventories for $PM_{2.5}$ and TACs from all significant emissions sources in West Oakland. A summary of the emissions inventory developed for the Action Plan for the base year (effective 2017) is described in this section by source category, including: permitted stationary sources, on-road mobile sources, truck-related businesses, sources due to activity in the Port of Oakland (ocean-going vessels, commercial harbor crafts, cargo handling equipment, Port Trucks at terminals, railyards), locomotives, railyards, commuter ferries and excursion vessels, and ferry berths. Emissions inventories from Port-related sources were largely based largely on the Port of Oakland 2017 Seaport Air Emissions Inventory (Ramboll 2018). Specific temporal and spatial allocation information for emissions source categories are discussed in Section 3, as they pertain to the emissions and dispersion modeling.

2.1 Development and Overview

2.1.1 Pollutants

AB 617 focuses on evaluating local community risk impacts associated with $PM_{2.5}$ and TACs (which includes DPM), which are the primary air pollutants that pose the greatest risk to the health of residents in West Oakland. A full list of TACs compounds included in this analysis is provided in Attachment 1. In the following emissions inventories and modeling results, DPM is presented separately from $PM_{2.5}$ and TACs. Only $PM_{2.5}$ concentrations and potential health impacts (cancer risk) from directly emitted $PM_{2.5}$ and TACs emissions were evaluated; secondary $PM_{2.5}$ and TACs were not included.

2.1.2 Domain

All sources in this analysis were located within the “Source Domain”, which encompassed the entire West Oakland community and Port of Oakland, as well as part of downtown Oakland (Figure 2-1). For comparison purposes, the extents of the Source Domain were defined such that they correspond to a subset of the two-dimensional grid cells used in the regional-scale modeling analysis (see Section 3.6). The Source Domain is 7 km × 5 km. All emission sources discussed in this section are located within the Source Domain; if an emissions source’s extents were beyond those of the Source Domain, only the emissions associated with the area within the Source Domain were included in the inventory.

2.1.3 Emissions Sources and Base Year

The emissions inventory consists of emissions from various source categories, as shown in Figure 2-2 and Table 2-1. These sources include stationary and mobile (on-road, off-road) sources of emissions. Annual emissions estimates were developed for a base year, effective 2017 (i.e., the emissions data from the year closest to 2017 was used for each source category).[5]

[5] Forecasted inventories for 2024 and 2029 are presented in Part II.

Figure 2-1. Extents of the Source Domain (red dotted lines) used to develop the emissions inventories. The extents of the map represent the extents of the Source Domain. The inner tiles represent the 1 km × 1 km grid cells of the regional-scale modeling.

In West Oakland, a large number of emissions source types are attributed to activity from the Port of Oakland. The Port is the fifth busiest port in the U.S. and serves as a gateway for intermodal cargo transport. In 2017, the Port consisted of four active marine terminals (TraPac, Nutter (STS/Everport), Oakland International Container Terminal [OICT], and Matson), and two railyards (Burlington Northern Santa Fe [BNSF], and Oakland Global Rail Enterprise [OGRE]). A fifth terminal (the Charles P. Howard terminal, located on the southeastern corner of the Port), has been vacant since the tenant filed for bankruptcy in 2010. Presently, the American Baseball League the Oakland Athletics (the A’s) is investigating the possibility of building a baseball stadium on the site that is currently being used for long term Port (drayage) Truck parking.

Maritime emissions developed for the West Oakland Action Plan were based largely on the *Port of Oakland 2017 Seaport Air Emissions Inventory* developed by Ramboll (2018), herein referred to as the 2017 Port Inventory. The District contracted Ramboll (with prior approval from the Port) to assist in developing further spatial and temporal allocations of emissions associated with Port activities. Most of the emissions inventory information for Port-related sources discussed herein are partially excerpted from Ramboll (2018), including information for: ocean-going vessels (OGVs) (Section 2.5), commercial harbor crafts (CHCs) (Section 2.6), cargo handling equipment (CHE) (Section 2.7), on-road heavy-duty vehicles (Section 2.8), locomotives (Section 2.9), and railyards (Section 2.10).

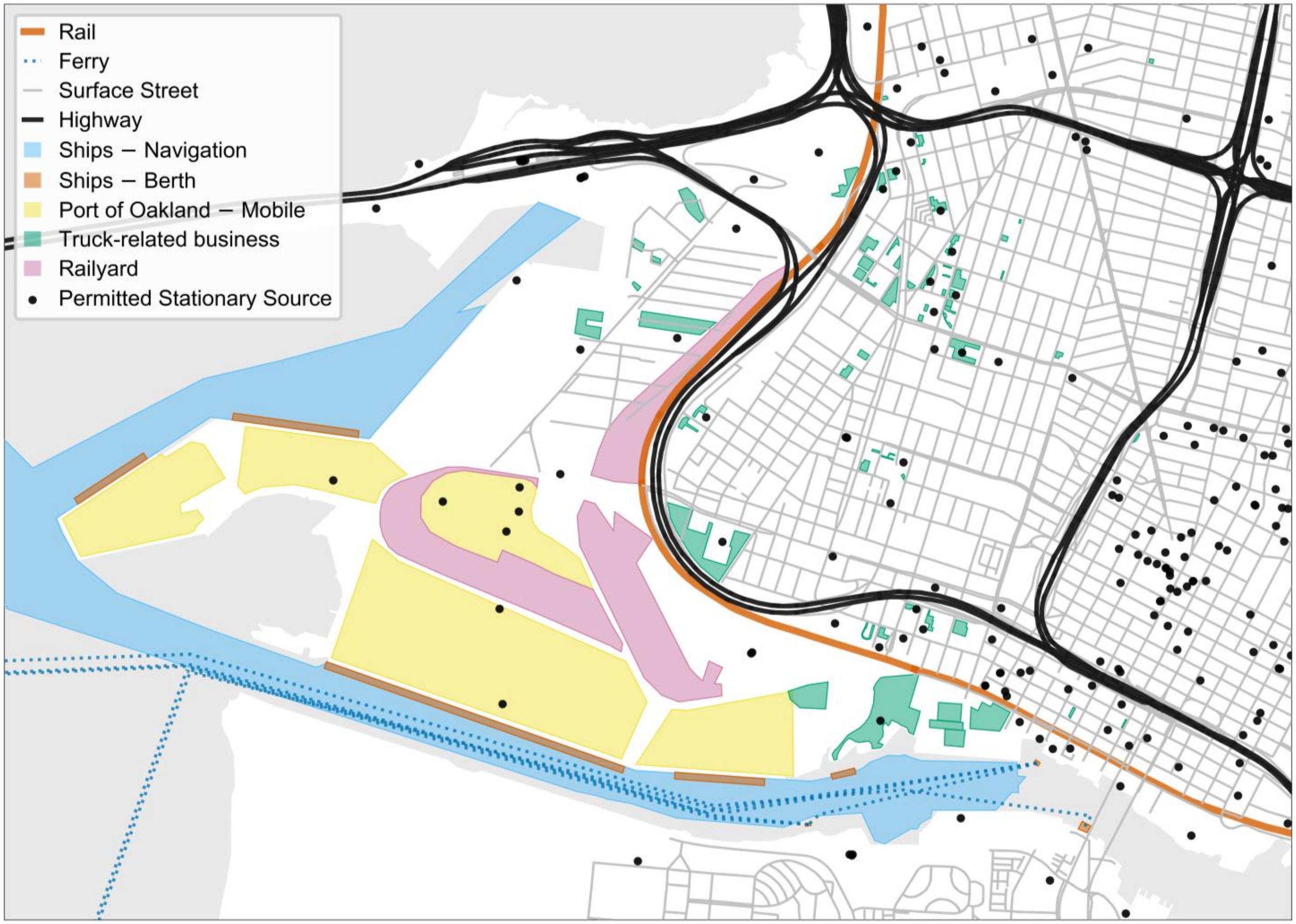


Figure 2-2. Composite of emissions source categories locations for the emissions inventory and community-scale modeling in West Oakland. Ships –Navigation encompasses the areas of emissions from ocean-going vessels (maneuvering) and commercial harbor crafts (assist tugs, dredgers, and bunkering tugs and pumps) at the Port, as well as ships transiting to Schnitzer Steel; Ships – Berth includes berthing areas for ships at the Port, Schnitzer Steel, commuter ferries, and excursion vessels. Port of Oakland – Mobile encompasses the areas of emissions from Port Truck activity (idling and transiting) and cargo-handling equipment; Surface Street may include on- and off-ramps. Only permitted stationary sources that were modeled are included.

Table 2-1. Emission source categories in West Oakland and year of data used to create the base year emissions inventory, effective 2017. The reference or data sources of the activity data and/or emissions data are indicated.

Section	Source Category	Year	Reference/Data Source
2.2	Permitted stationary sources	2015–2018	District (based on 2017 CEIDARS report)
2.3	On-road mobile sources	2017	Citilabs, StreetLight, Caltrans Truck Volumes, Caltrans PeMS, EMFAC2017, CT-EMFAC2017, Bay Area Air Quality Management District (2009)
2.4	Truck-related businesses	2018	Bay Area Air Quality Management District (2009), District survey (2018)
2.5	Ocean-going vessels	2017	Ramboll (2018), Port of Oakland
2.6	Commercial harbor crafts	2017	Ramboll (2018), Port of Oakland
2.7	Cargo handling equipment	2017	Ramboll (2018), Port of Oakland
2.8	Port Trucks at Terminals	2017	Ramboll (2018), District
2.9	Locomotives	2017–2018	District (passenger), UP and BNSF (freight)
2.10	Railyards	2017	Environ International Corporation (2008), UP
2.11	Commuter ferries and excursion vessels	2018	CARB, WETA, District survey (2018)

While there are some privately owned terminals and non-maritime activity on Port property, emissions from these sources are not included in the Port source categories. For example, emissions from activities at Schnitzer Steel and from truck fleets operating on Port property were accounted for separately.

Finally, emissions sources and categories that were not included in the community-scale emissions inventory include:

- residential wood burning (from fireplaces and wood stoves);
- commercial and residential cooking;
- construction activities;
- personal power boats;
- transportation refrigeration units (TRUs);
- law and home gardening equipment;
- portable combustion engines;
- small artisans or businesses that do not require District permits; and
- the Amtrak Oakland maintenance facility (located near 3rd Street/Adeline Street).

While emissions from these categories are potentially important sources of $PM_{2.5}$ and TACs on a community scale, they are either (a) difficult to analyze (e.g., for wood burning and cooking, the spatial and temporal distribution of emissions are poorly understood), or (b) deemed to be less important than similar sources that are included in the emissions inventory (e.g., emissions from lawn equipment, an off-road mobile source, are many times smaller than emissions from on-road mobile sources; emissions from personal power boats are many times smaller compared to those from ocean-going vessels). The emissions from some of these categories were estimated using top-down approaches (see Table 2-3), but were not further included in the analysis or risk assessment.

2.1.4 Approach

A bottom-up emissions inventory involves estimating emissions using (1) emission factors (mass of pollutant emitted per unit of activity), and (2) local activity information of the emission processes (e.g., number of events, duration of activity). Emission factors vary by source type and/or emissions process, and can depend on other factors, such as the source age, model year, control technology, load, fuel type, speed, and ambient conditions, where applicable. Local activity information varies by source and by year (and by season and/or hour, depending on the source). In this analysis, activity data from 2017 (or nearest year available; Table 2-1) by source type was used, and then convolved with corresponding emission factors to estimate emissions.

2.1.5 Emissions by Category

Based on the bottom-up emissions inventory, there were 86.32 tpy of $PM_{2.5}$ and 25.49 tpy of DPM emitted in 2017 in West Oakland (Figure 2-3). These values represent the total emissions from numerous source categories, as described in the remaining sections and in Table 2-2, and are used to perform the community-scale dispersion modeling (using AERMOD) and risk assessment (Section 4). The largest portion of $PM_{2.5}$ emissions in West Oakland arises from on-road mobile sources (~51%, including Port Trucks and operations at truck-related businesses); the Port and permitted stationary sources contribute nearly equal amounts (~26% and ~21%, respectively). In contrast, most DPM emissions in West Oakland are from activity related to the Port (~69%).

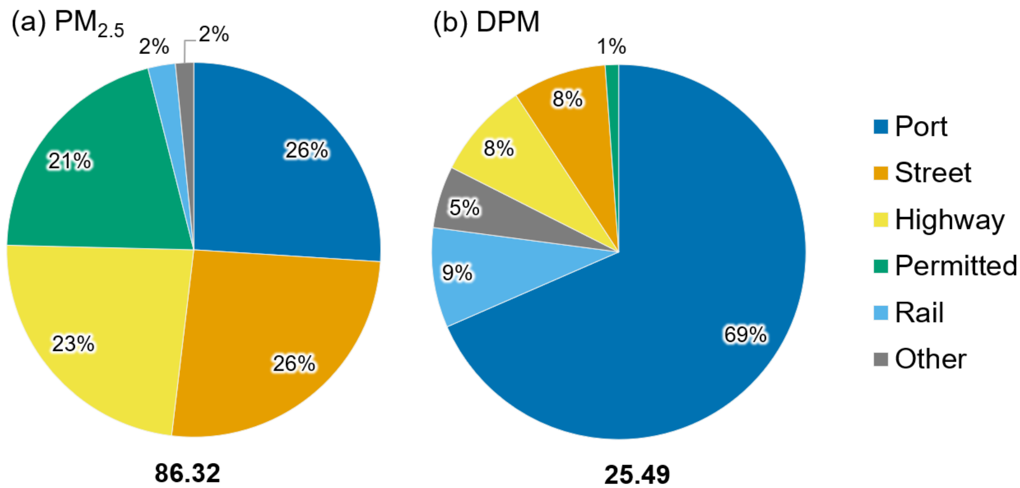


Figure 2-3. Emissions of (a) $PM_{2.5}$ and (b) DPM by source category included in the 2017 community-scale (bottom-up) West Oakland emissions inventory within the Source Domain. Emissions from Highway and Street are composed of emissions from all on-road mobile sources except Port Trucks, which are attributed to the Port category. The total emissions (tpy) of each pollutant is displayed below their respective pie chart. Source categories are further described in Table 2-2.

As discussed in Section 2.1.3, there are several emission sources in West Oakland that were not accounted for in the bottom-up community-scale emissions inventory. These emissions sources were namely fuel combustion and commercial area sources, and non-road mobile sources (Table 2-3). Emissions from these sources were derived from regional-scale modeling (using SMOKE), but were not included in the subsequent analyses or risk calculations. Of these emissions sources, only non-road mobile sources emit DPM.

The grand total emissions in West Oakland can be estimated by summing the results from the bottom-up emissions inventory and the top-down emissions inventory. Therefore, the total emissions of $PM_{2.5}$ in West Oakland were estimated as 129.72 tpy, where the community-scale analysis accounts for 67% of these total emissions. Similarly, 86% of total DPM emissions (29.61 tpy) are accounted for in the community-scale analysis.

Table 2-2. Emissions by Source Category within the Source Domain. Percentage (%) of emissions are reported as a total of the entire inventory ("Total" row) and within categories. The Port Trucks category includes emissions from all Port Trucks, regardless of location (i.e., within the Port and operating on Highways and Surface Streets).

Source Category	$PM_{2.5}$			DPM		
	tpy	% of total	*% within*	tpy	% of total	*% within*
Highway	**20.28**	**23.5**	***100.0***	**2.12**	**8.3**	***100.0***
Non-Trucks	12.22	14.1	*60.3*	0.19	0.7	*9.0*
LHDT	0.41	0.5	*2.0*	0.09	0.3	*4.0*
MHDT/HHDT	2.48	2.9	*12.2*	1.84	7.2	*87.0*
Road dust	5.17	6.0	*25.5*	-	-	-
Surface Streets	**22.34**	**25.9**	***100.0***	**2.06**	**8.1**	***100.0***
Non-Trucks	4.82	5.6	*21.6*	0.09	0.4	*4.5*
LHDT	0.35	0.4	*1.6*	0.09	0.4	*4.5*
MHDT/HHDT	2.43	2.8	*10.9*	1.88	7.4	*91.0*
Road dust	14.74	17.1	*66.0*	-	-	-
Port	**22.46**	**26.0**	***100.0***	**17.45**	**68.5**	***100.0***
OGV – maneuvering	3.94	4.6	*17.6*	3.84	15.1	*22.0*
OGV – berthing	8.59	10.0	*38.3*	6.20	24.3	*35.5*
Dredging	1.12	1.3	*5.0*	1.16	4.6	*6.6*
Assist Tugs	3.64	4.2	*16.2*	3.75	14.7	*21.5*
Bunkering (tugs, pumps)	0.16	0.2	*0.7*	0.17	0.7	*1.0*
CHE	1.59	1.8	*7.1*	1.58	6.2	*9.1*
Port Trucks	0.93	1.1	*4.1*	0.50	2.0	*2.9*
Road dust	2.25	2.6	*10.0*	-	-	-
Railyard – OGRE	0.07	0.1	*0.3*	0.08	0.3	*0.4*
Railyard – BNSF	0.17	0.2	*0.7*	0.18	0.7	*1.0*
Rail	**2.04**	**2.4**	***100.0***	**2.20**	**8.6**	***100.0***
Locomotives	1.02	1.2	*50.0*	1.09	4.3	*49.5*
Railyard – UP	1.02	1.2	*50.0*	1.11	4.4	*50.5*
Permitted	**17.84**	**20.7**	***100.0***	**0.30**	**1.2**	***100.0***
CA Waste (10th Street)	0.46	0.5	*2.6*	0.00	0.0	*0.0*
California Cereal	0.58	0.7	*3.2*	0.00	0.0	*0.0*
CASS	0.72	0.8	*4.0*	0.00	0.0	*0.0*
Dynegy	1.96	2.3	*11.0*	< 0.01	< 0.1	*0.1*
EBMUD	3.99	4.6	*22.4*	0.09	0.4	*30.0*
Pinnacle Ag Services	1.48	1.7	*8.3*	0.00	0.0	*0.0*
Schnitzer Steel – stationary	5.20	6.0	*29.2*	0.00	0.0	*0.0*
Sierra Pacific	0.91	1.1	*5.1*	0.00	0.0	*0.0*
Other	2.53	2.9	*14.2*	0.21	0.8	*69.9*
Other	**1.36**	**1.6**	***100.0***	**1.36**	**5.4**	***100.0***
Ferry/Excursion vessels	0.91	1.1	*66.7*	0.93	3.7	*68.4*
Schnitzer Steel – OGV	0.30	0.4	*22.2*	0.30	1.2	*22.2*
Schnitzer Steel – trucks	0.04	< 0.1	*2.8*	0.01	< 0.1	*0.8*
Truck-related businesses	0.11	0.1	*8.2*	0.12	0.5	*8.6*
Total	**86.32**	**100.0**		**25.59**	**100.0**	

Table 2-3. Total emissions by Source Category within the Source Domain based on regional-scale emissions inventory (not included in community-scale bottom-up emissions inventory). Percentage (%) of emissions are reported as a total of the entire inventory ("Total" row) and within categories.

Source Category	PM$_{2.5}$			DPM		
	tpy	% of total	*% within*	tpy	% of total	*% within*
Area	**30.40**	**70.0**	***100.0***	**0.00**	**0.0**	
Commercial cooking	20.63	47.5	*67.9*	0.00	0.0	–
Food and agriculture	0.00	0.0	*0.0*	0.00	0.0	–
Fuel combustion – residential	6.93	16.0	*22.8*	0.00	0.0	–
Fuel combustion – Commercial/industrial	2.30	5.3	*7.6*	0.00	0.0	–
Industrial processes	0.03	0.1	*0.1*	0.00	0.0	–
Solvent use	0.00	0.0	*0.0*	0.00	0.0	–
Consumer products	0.00	0.0	*0.0*	0.00	0.0	–
Other	0.50	1.2	*1.6*	0.00	0.0	–
Non-road	**13.00**	**30.0**	***100.0***	**4.12**	**100.0**	***100.0***
Construction – equipment	4.10	9.5	*31.6*	3.33	80.8	*80.8*
Construction – dust	6.74	15.5	*51.9*	0.00	0.0	*0.0*
Commercial/industrial equipment	1.17	2.7	*9.0*	0.51	12.5	*12.5*
Lawn and garden equipment	0.12	0.3	*0.9*	0.02	0.5	*0.5*
TRUs	0.24	0.5	*1.8*	0.26	6.2	*6.2*
Other	0.63	1.4	*4.8*	0.00	0.0	*0.0*
Total	**43.40**	**100.0**		**4.12**	**100.0**	

2.2 Permitted Stationary Sources

Stationary sources of air pollution are regulated and subject to permitted conditions established by the District. These include complex sources such as metal smelting, wastewater treatment plants, and Port activities, and smaller facilities, such as diesel generators, gasoline dispensing facilities (GDFs, or gas stations), and boilers. The District maintains a database of its permitted sources and their associated characteristics and emissions. These emissions are determined either through direct measurement (via source tests) or by engineering calculation (based on process throughput and industry emission factors). Emission values are updated annually or bi-annually, depending on their permit cycle. Emissions from all permitted facilities are reported annually to CARB under the California Emissions Inventory Development and Reporting System (CEIDARS)[6] and, subsequently, reported to the U.S. Environmental Protection Agency (EPA) to supplement the National Emissions Inventory (NEI) database.[7] The 2017 CEIDARS report was used as the basis to assemble emissions for permitted facilities located in West Oakland and surrounding areas (encompassing zip codes 94607, 94608, 94609, 94612, 94615, and 94501). The inventory was developed for PM$_{2.5}$ and TACs, including DPM.

[6] CEIDARS 2.5 Database Structure can be found at: https://www.arb.ca.gov/ei/drei/maintain/dbstruct.htm.
[7] EPA NEI web page can be found at: https://www.epa.gov/air-emissions-inventories.

Quality assurance (QA) was performed and updates were made to the report to include newly permitted facilities and removed facilities that closed after 2017. Another important improvement was the addition of GDFs to the point-source inventory. Historically, emissions from GDFs have been aggregated and reported as part of county-level area totals in CEIDARS. The emissions inventory for West Oakland includes 32 GDFs geolocated with actual or permitted throughputs, which were used to individually estimate their emissions.

The District made other updates to the emissions estimates in the 2017 CEIDARS report, mainly to ensure that the latest emissions factors, source test results, and methods used to estimate emissions were incorporated. In most of these cases, the individual facility's emissions were revised by specific facility source (e.g., Custom Alloy Scrap Sales [CASS], East Bay Municipal Utility District [EBMUD], and Schnitzer Steel; Table 2-4). Otherwise, source specifications and associated emissions from entire source categories were updated (Table 2-4).
Certain categories of permitted stationary sources were excluded from the emissions inventory, such as portable engines, other portable equipment, and most registered restaurants,[8] since their operations are intermittent and their emissions are generally not well characterized. Dry cleaners[9] were also excluded since pollutants currently emitted from these sources do not contribute to cancer risk. Other permitted stationary sources were excluded from this analysis for one of the following reasons:

- There were no associated $PM_{2.5}$ emissions and/or TAC emissions available, or these emissions could be estimated based on data available;
- There were no $PM_{2.5}$ emissions and TAC emissions were non-cancerous; and/or
- The source had emissions from solvents only.

While the permitted stationary source database originally contained 430 individual sources among 205 unique facilities, only 322 sources had associated emissions of $PM_{2.5}$ or cancerous TACs among 170 unique facilities. These 322 sources were modeled in this analysis (Table 2-5). The final list of permitted stationary sources included in this analysis is provided in Attachment 2. Less than half (~42%) of these sources had known release heights (required for dispersion modeling; see Section 3.1), and only ~34% had complete dispersion modeling parameters.[10]

The majority of permitted stationary sources in West Oakland are located on the eastern side of the modeling domain (Figure 2-4). GDFs are the most evenly spatially distributed. Back-up generators are clustered in the downtown Oakland area, reflecting the fact that many multi-story buildings (such as hotels or offices) have emergency generators. Coffee roasters are mainly located in the industrial area south of I-880, whereas cement-related facilities are located in the northwest quadrant of the West Oakland community. Other sources are associated with industrial activities and tend to be located near main arterial roadways such as 7th Street, West Grand Avenue, and Peralta Street.

---

[8] One restaurant with charbroiling operations was included since emissions information was available.

[9] All dry cleaners in the Source Domain used petroleum-based solvents, and therefore did not have associated TAC emissions.

[10] A complete set of release parameters for point sources includes: stack height, stack diameter, gas exit temperature, and gas exit flow rate. A complete set of release parameters for volume sources includes: stack height, and initial lateral dispersion coefficient (which can be estimated from the stack diameter).

Table 2-4. Updates performed to permitted stationary sources in the 2017 CEIDARS report. The name of the facility or category of the source is provided, with the plant number (P), source ID (S), and information regarding updates to the emission factors (EF) and/or emissions.

Name/Category	P	S	Source Description	Updates
CASS	146	1	furnace	Emissions increased to reflect source test results.
		2	furnace	Emissions were decreased by using updated EFs.
		7	material handling	Emissions increased.
Schnitzer Steel	208	6	shredder	Emissions increased based on source test results (reported for Stack 15, identified as Source 6).
		–	–	Fugitive emissions included.
EBMUD	591	100	wet treatment process	Emissions decreased based on influent testing.
		37 – 39	standby generator	Emissions for DPM increased by using default EFs.
		52	portable emergency electric generator	Source removed from the inventory since it is no longer in use.
		–	–	Other carcinogenic pollutants associated with diesel fuel were excluded since DPM is a surrogate for all toxic compounds collectively emitted during diesel oil combustion.
Central Concrete	1253	1	aggregate piles	Emissions were decreased by using updated EFs.
		2	cement silo	Emissions were decreased by using updated EFs.
		3	conveyors	Emissions were decreased by using updated EFs.
		4	cement batcher	Emissions were decreased by using updated EFs.
Dynergy	11887	1 – 6	gas turbine	Emissions were decreased by using updated EFs.
Sierra Pacific	18268	1, 2	aggregate handling	Emissions were decreased by using updated EFs.
		3	silo	Emissions were decreased by using updated EFs.
		4	truck loading	Emissions were decreased by using updated EFs.
		5	conveyor	Emissions were decreased by using updated EFs.
standby generators and fire pumps	–	–	–	DPM was used as a surrogate to represent all carcinogenic compounds that may be emitted from combustion of diesel fuel. However, other toxic compounds were included in the analysis if the generators burned natural gas or digester gas.

Table 2-5. Summary of data completeness for permitted stationary sources in West Oakland. The final inventory reflects the number of sources modeled in this analysis that had associated emissions of $PM_{2.5}$ and/or TACs that contribute to cancer risk.

Inventory	Record type	Number of records
Original	Number of permitted stationary sources	430
	Number of unique facilities	205
Final	Number of permitted stationary sources	322
	Number of unique facilities	170
	Sources with known release heights	134
	Sources with complete dispersion modeling parameters	110

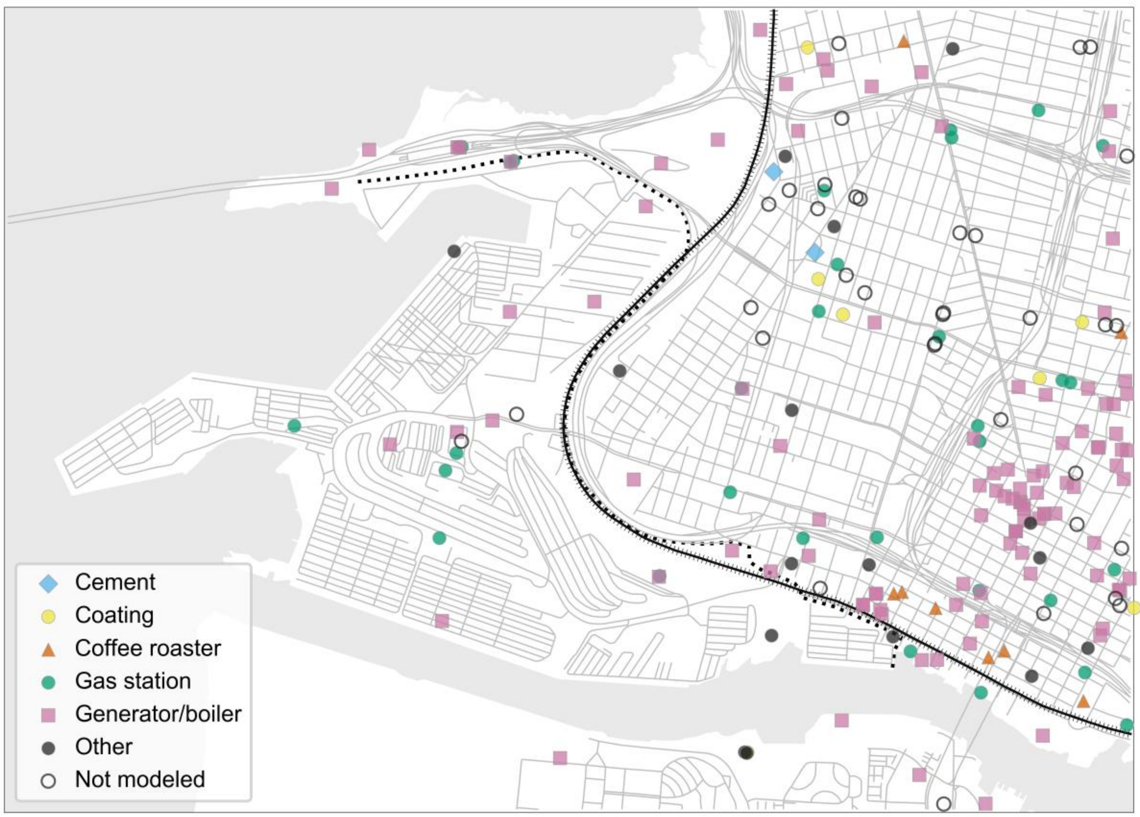


Figure 2-4. Location of permitted stationary sources in West Oakland. "Generator/boiler" indicates either a generator (primary or standby), boiler, generator and boiler, or generator and fire pump. "Other" sources include: charbroilers, cremators, electric shredders, furnaces, grain systems, microturbines, printing presses, recycling, sandblasting, smoke houses, soil vapor extraction, and turbines. Sources that were "Not modeled" were excluded because either $PM_{2.5}$ emissions were not available, or because the TACs that are emitted do not contribute to cancer risk.

2.3 On-Road Mobile Sources

The approach for developing an emissions inventory from on-road mobile sources depended on location: due to data availability, those from roadways within terminals at the Port were developed separately (by Ramboll (2018); see Section 2.8) from those within the rest of the Port area and West Oakland community. In this section, the process for developing a bottom-up emissions inventory for the remaining roadways is presented.

Emissions from vehicles travelling on roadways in urban environments tend to occur near *sensitive receptors*,[11] and have been shown to have a high intake fractions (ratio of inhaled to emitted pollutants; Marshall *et al.* 2005). For this analysis, a bottom-up emissions inventory of $PM_{2.5}$ and TAC pollutants was developed using annual average daily emission profiles for each roadway segment (or roadway "link"[12]) within the West Oakland Source Domain. Annual average daily emission profiles were developed by vehicle category and for weekday (WD) (Monday–Friday) and weekend (WE) (Saturday–Sunday) days separately since traffic activity varies significantly by day of week (typically, total daily traffic is higher on weekdays, with slower fleet average speeds; peak traffic periods may also vary due to commuting).

Pollutants are emitted from on-road mobile sources due to the following processes:

- *Operational* emissions result from the consumption and combustion of fuel or from wear of vehicle-related materials. The emissions processes include:
    - Running exhaust, when pollutants are emitted from the tailpipe of the vehicle as the fuel is combusted;
    - Running loss, when fuel vapors escape from the fuel system during operation;
    - Tire wear, when PM is emitted as a result of a vehicle's tires wearing on the road surface; and
    - Brake wear, when PM is emitted as a result of wearing of brake discs as the vehicle's brakes are applied.

  In California, emission factors from these processes are typically estimated by using the EMission FACtors (EMFAC) model, which is developed and maintained by CARB. In this analysis, operational on-road mobile source emission included the four processes listed above, as defined[13] in the latest version of EMFAC, EMFAC2017 (v1.0.2) (California Air Resources Board 2017b).

- *Re-entrained road dust* emissions are particulate matter from resuspended road surface material (dust) that is entrained by vehicles traveling on roads. Currently, road dust emission factors are estimated following CARB's method for paved road dust (California Air Resources Board 2016), which is based on the EPA Air Pollution (AP) report *AP-42*

---

[11] Sensitive receptors are locations where occupants are more susceptible to adverse health effects of air pollution exposure, including schools, hospitals, daycare facilities, elderly housing, etc.

[12] A link is a section of roadway where either roadway attributes or travel activity are constant along the length of the section.

[13] EMFAC2017 is a trip-based mobile source emissions model. As such, running exhaust emission factors also account for idling events (and other processes, such as crankcase exhaust) during normal vehicle operation (California Air Resources Board 2015), such as a vehicle idling while queuing at an intersection for a limited amount of time. Therefore, idling exhaust emissions were not explicitly calculated for on-road mobile sources. Extended idling events of heavy-duty vehicles were accounted for separately (see Section 2.4).

Compilation of Air Pollutant Emissions Factors, Volume I (or simply "AP-42") Chapter 13.2.1 Paved Roads (U.S. Environmental Protection Agency 2011). Entrained road dust on paved roadways can be significant source of $PM_{2.5}$, especially as the relative proportion of emissions from other vehicle processes decreases over time (Reid *et al.* 2016).

Bottom-up emissions inventories from on-road mobile sources can be calculated at different levels of aggregation. For example, emissions may be calculated by individual vehicle types (e.g., passenger car, motorcycles), or by vehicle categories (e.g., Non-Trucks, which includes passenger cars and motorcycles; Table 2-6). EMFAC2017 groups all vehicle classes into three vehicle categories: Non-Truck (NT), Truck 1 (T1), and Truck 2 (T2). In this analysis, operational emissions were namely estimated by vehicle category (Table 2-6) based on the vehicle categorization EMFAC2017, as well as analysis needs (so that potential mitigation measures can be applied to specific source categories within the source apportionment). The EMFAC2017 default Non-Truck and Truck 1 results were used, but the default Truck 2 category was further divided into two categories: Port drayage trucks (POAK), and the remaining EMFAC2017 Truck 2 vehicles (Non-POAK-Truck 2, or NPT2). This was done because Port Trucks have historically been significant source of DPM in West Oakland (California Air Resources Board 2008a); however, POAK emission factors in EMFAC2017 suggest a much cleaner Port Truck fleet because of CARB's Drayage Truck Regulation (California Air Resources Board 2011b). Therefore, designating Port Trucks to a single category could help evaluate the emissions contribution and the effectiveness of regulations. Finally, the total of all truck-related categories – Truck 1, POAK, and Non-POAK-Truck 2 – may be referred to collectively as "Trucks".

Table 2-6. Emission source and vehicle categories from on-road mobile sources. Vehicle categories are generally based on gross vehicle weight rating (GVWR) and based on EMFAC2017 (see California Air Resources Board 2017a).

Emissions Category	Vehicle Category	Description/Vehicle Types
Operational	NT	Passenger cars, passenger trucks, medium-duty trucks (GVWR ≤ 8,500 lb), buses, motorcycles, motor homes, motor coaches.
	T1	Light-Heavy Duty Trucks (LHDT) (GVWR 8,501–14,000 lbs)
	POAK	Heavy-Heavy Duty Diesel Drayage Truck in Bay Area (GVWR > 33,000 lb) (referred to as "Port Trucks" or "drayage trucks" in this analysis).
	NPT2	Medium-Heavy Duty Trucks (MHDT) (GVWR 14,001–33,000 lb) and Heavy-Heavy Duty Trucks (HHDT) (GVWR > 33,000 lb), excluding Port Trucks.
Road dust	All	Entrained road dust (PM_{10} and $PM_{2.5}$) on paved roads.

To develop a bottom-up link-level emissions inventory for on-road mobile sources, the data needed are (1) roadway attributes, (2) vehicle travel activity, and (3) corresponding emissions factors (by vehicle emissions process and category). In this analysis, the majority of the roadway attributes and travel activity data were purchased from Citilabs (Streetlytics platform).[14] A set of shapefiles containing the geographic location, travel activity (volume and speed), and roadways

[14] http://www.citilabs.com/.

attributes of roadway segments in Alameda County was obtained for 2016 by hour of day for four seasons and four day types (Monday–Thursday, Friday, Saturday, and Sunday). To use this dataset to develop an emissions inventory and to support AERMOD dispersion modeling:

(1) The roadway network was clipped to the Source Domain; some roadway segments were shortened and their lengths recalculated, while other segments had to be manually extended to meet the edge of the domain (namely, the roadway segments representing the San Francisco-Oakland Bay Bridge).
(2) Roadway segments were excluded in Port terminal areas.
(3) Corresponding roadway segments that represented the total 2-way directional traffic were merged, so that the resulting line geometry represented the approximate centerline of the roadway.[15] As a result, there were 6,861 roadway segments in the West Oakland Source Domain.
(4) By performing (3), the number of lanes and hourly traffic volume in both directions were added, and the hourly traffic speeds were averaged (weighted by hourly volume).
(5) The data was then aggregated into two day types (WD, representing travel activity from Monday–Friday, and WE, representing travel activity from Saturday-Sunday) and averaged across all seasons.

A description of the parameters from Citilabs and other data sources used to develop a vehicle-type (Non-Truck/Truck) and day-type (WD/WE) specific emissions inventory are described in the following sections.

2.3.1 Roadway Attributes

The geometry of each roadway link is used to perform AERMOD dispersion modeling, while the associated roadway attributes are used to estimate emissions from on-road mobile sources. The roadway attributes required include: roadway length, road type, and number of lanes. A description of these attributes and how they are used to support developing the emissions inventory and/or dispersion modeling are provided in Table 2-7.

Table 2-7. Roadway attributes and associated data sources used for estimate emissions from on-road mobile sources.

Parameter	Purpose	Reference/ Data Source
Roadway Length	Determine (a) geographic locations of roadways (used in AERMOD dispersion modeling; Section 3.4.3), and (b) calculate vehicle miles traveled (VMT) used in estimating emissions.	Citilabs (updated by the District)
Road Type	Determine (a) roadway width (used in AERMOD dispersion modeling; Section 3.4.3), and (b) silt loading (to calculate road dust emissions).	Citilabs, CARB
Number of Lanes	Determine total width of roadway (used in AERMOD dispersion modeling; Section 3.4.3).	Citilabs (updated by the District)

[15] The District did not QA the location of the roadway segment centerlines.

The road type assigned to each roadway segment was mainly based on the roadway functional class provided by Citilabs (based on HERE), which is defined as "a hierarchical network [index] used to determine a logical and efficient route for a traveler."[16] These classes were matched to corresponding U.S. Federal Highway Administration (FHWA) Road Types (which are based on level of service and are used to determine roadway widths) and CARB Road Types (which are based on "anticipated usage, modes of usage, and silt loading potential" (California Air Resources Board 2016) and are used to determine roadway surface silt loading factors; Table 2-8). Because of the mismatch between roadway classification systems, freeway on- and off-ramps, which are assigned to multiple functional classes, can then be assigned to numerous CARB and FHWA road types; for simplicity, the District did not adjust these assignments.[17] Additionally, roadway segments were also assigned to road category ("Highway" and "Surface Street"; Table 2-8) which were created to align with available data and the source apportionment approach.

Finally, truck route type was assigned to each roadway segment based on information obtained from the City of Oakland:[18] (1) prohibited truck routes, (2) major truck routes, or (3) neither (Figure 2-5). These route designations were used to determine fleet mix information (see Section 2.3.2(b)).

For the resulting 2-way merged roadway network, QA was performed on the number of lanes only for roadways where (a) the number of lanes in either direction was one, and (b) the total 2-way AADT $\geq$ 5000.[19] The District updated the number of lanes of 274 (4%) roadway segments. If the number of lanes for a segment was not a whole number (integer), the value was rounded down (e.g., 4.5 lanes was rounded to 4 lanes), as the fractional lane often corresponded to roadway sections designated for street parking.

Table 2-8. Cross-reference of road type classification schemes used in this analysis. Functional Class were obtained from Citilabs and mapped to CARB Road Type (based on California Air Resources Board (2016), used to determine silt loading factors for estimating road dust emissions), FHWA Road Type (based on FHWA and American Association of State Highway and Transportation Officials (2018), used to determine roadway width), and Road Category (used in this analysis for source apportionment).

Functional Class	CARB Road Type	FHWA Road Type	Road Category
2 - Major Highways	Freeway	Freeway	Highway
3 - Minor Highways	Major/Collector	Arterial	Surface Street
4 - Minor Streets	Major/Collector	Arterial	Surface Street
5 - Local Roads	Local	Local	Surface Street

[16] See http://marketing.citilabs.com/hubfs/Here_Attributes.pdf (accessed February 2019).
[17] This results in a conservative estimate for road dust emissions; on- and off-ramps are then assigned to arterial and local roads, which typically have more dust (higher silt loading factors) than freeways.
[18] https://www.oaklandca.gov/.
[19] According to the District's current California Environmental Quality Act guidelines, a roadway with AADT < 10,000 is likely not a significant source. In this analysis, AADT < 5,000 was used to determine which roadways should be reviewed, to be conservative (Bay Area Air Quality Management District 2017).

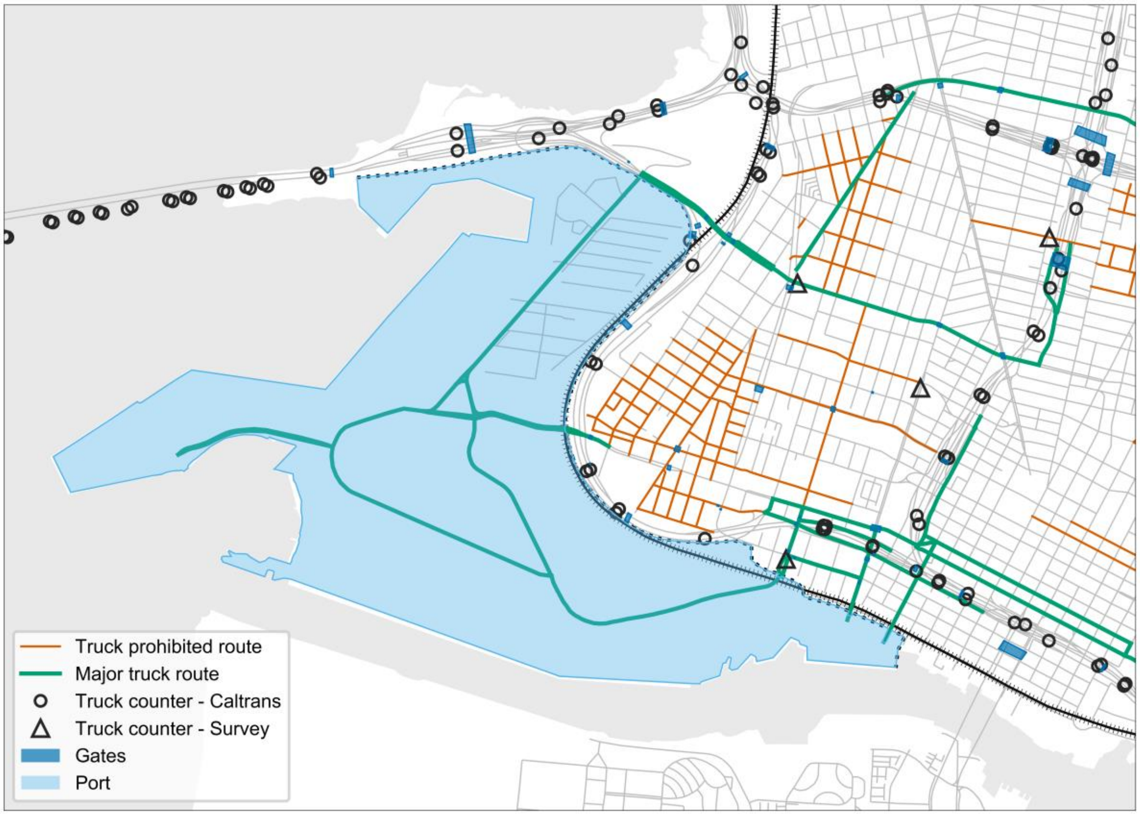


Figure 2-5. Roadway network and data sources used to develop the emissions inventory for on-road mobile sources. The roadways (solid lines, provided by Citilabs), traffic counters (open symbols), Port boundary (dashed line), and gates (blue polygons, used in the StreetLight InSight platform) are plotted. Caltrans truck counters may appear off of the Bay Bridge because the bridge was reconstructed (completed ~2013) and the location of the counters were not updated in PeMS. Only roadway segments modeled as volume sources in AERMOD are plotted (i.e., some roadways in the Port terminal areas are not displayed, since they were accounted for in the Port emissions inventory; see Section 2.8).

2.3.2 Travel Activity

Vehicle travel activity data characterizes the type of fleet and how that fleet travels on a roadway. Emissions are estimated based on these parameters, which include: volume, speed, fleet mix, and fleet average vehicle weight (Table 2-9). These parameters are further described below.

Table 2-9. Travel activity parameters and associated data sources used for estimate emissions from on-road mobile sources. Parameters can vary hourly and by roadway link.

Parameter	Description	Purpose	Reference/ Data Source
Volume	Average total traffic fleet volume.	Calculate VMT and VHT, which are used to estimate emissions from all processes (operational and road dust).	Citilabs
Speed	Average total traffic fleet speed.	(a) Estimate running exhaust emissions (emission factors are speed-dependent), and (b) estimate VHT.	Citilabs
Fleet Mix	Composition of vehicle fleet (i.e., volume fraction for each vehicle category).	Apportion fleet-total VMT to each vehicle category.	StreetLight, Caltrans Truck Traffic Volumes, Caltrans PeMS, Bay Area Air Quality Management District (2009)
Fleet average vehicle weight	Volume-weighted average weight of vehicle in fleet	Estimate road dust emission factors.	CT-EMFAC2017

(a) Volume and Speed

For each link, traffic volume and speed can be used to calculate:

- Vehicle miles travelled (VMT): the mileage of all vehicles traveling on a link over a specific period (e.g., hourly, daily). That is, VMT is the product of volume (unitless) and link length (mi). VMT is used to estimate emissions that are based on gram-per-mile (g/mi) emission factors (running exhaust, tire wear, brake wear, road dust).
- Vehicle hours traveled (VHT): the travel time of all vehicles traveling on a link over a specific period (e.g., hourly, daily). VHT is estimated by dividing VMT (mi) by speed (mph). VHT is used to estimate emissions due to running loss.

Hourly total fleet volume and speed data by roadway link and day type were obtained from Citilabs. Due to availability, this data was based on 2016 travel activity; to create a 2017 base year activity data set, the District then adjusted the total volumes (and therefore VMT and VHT) by a growth factor (0.6%) derived from the Alameda County VMT information in EMFAC2017. For each roadway link, Hourly VMT and VHT were calculated for each roadway link, and VMT was then allocated to vehicle types (Table 2-6) by using fleet mix information (see below).

(b) Fleet Mix

The annual average fleet mix by WD and WE were developed in two steps: (1) by deriving volume-based fleet mix fractions of Non-Truck, Truck 1 and Truck 2, and then (2) by splitting the Truck 2 fraction into POAK and Non-POAK-Truck 2. Due to data availability, this fleet mix information for step (1) was developed by road category, as follows:

- For Highways: the fractions of Non-Truck, Truck 1 and Truck 2 were first derived from the 2016 Truck Traffic Volumes (Truck AADT) from the California Department of Transportation (Caltrans).[20] The dataset contains traffic counts by axles at specific locations on freeways. Counts were then be allocated to Non-Truck, Truck 1, and Truck 2. However, given the limited spatial coverage of the counters (e.g., there are no counters on I-880), a second dataset was compiled to further develop fleet mix information, based on Caltrans Performance Measurement System (PeMS)[21] counters. PeMS data contains total traffic flow and truck flow at specific locations on freeways. Data was obtained for 2016 and used to derive total truck fractions[22] along remaining highway roadway segments. As PeMS truck flow represents the total traffic flow of all Trucks, the truck fraction from PeMS was split into fractions of Truck 1 and Truck 2 based on VMT from EMFAC2017 (for 2017 Alameda County) by truck category. The resulting truck fractions were assigned to highways links based on their spatial proximity to Caltrans Truck Traffic counters or Caltrans PeMS counters (Figure 2-5).

- For Surface Streets: the fractions of Non-Truck, Truck 1 and Truck 2 were derived based on traffic axle counts at four auto-counters located on surface streets from the 2009 West Oakland Truck Survey (Bay Area Air Quality Management District 2009; Figure 2-5, Table 2-10). The fractions were assigned to surface street links based on their spatial proximity to the counters. If a surface street link was a major or prohibited truck route, then the nearest counter of the same route type was used (this prevented assigning higher truck fractions to surface streets that were truck-prohibited routes). For roadway links within Port area, fleet mix fractions were derived from the counter at the Port access point (3rd Street/Adeline Street) only.

Table 2-10. Description of location of automatic traffic counters from the 2009 West Oakland Truck Survey (Bay Area Air Quality Management District 2009).

Automatic counter location	Total traffic level	Route description
3rd Street/Adeline Street	High	Major truck route (3rd Street)
West Grand Avenue/Mandela Parkway	High	Major truck route (West Grand Avenue)
18th Street/Market Street	Moderate	Truck-prohibited route (18th Street)
30th Street/Martin Luther King Drive	Low	Truck-prohibited route (30th Street)

[20] Available from http://www.dot.ca.gov/hq/tsip/gis/datalibrary/Metadata/TruckAADT.html (downloaded February 2019).
[21] http://pems.dot.ca.gov/.
[22] All truck flow (volume) data in the PeMS data used was marked as "imputed." This means that the data are estimated from other available parameters from the traffic counter and/or other surrounding traffic counters in the PeMS network (see http://pems.dot.ca.gov/?dnode=Help&content=help_calc#truck).

Generally, the fleet mix by roadway link resulted in a higher proportion of Trucks on major Truck routes and some major arterials in West Oakland, and a lower proportion of Trucks on truck-prohibited routes and local roads (Figure 2-6). Notably, using this procedure resulted in a high Truck fraction in near the Port entrance at 3rd Street/Adeline Street and in the surrounding neighborhood, especially on weekdays.

In step (2), the fleet fraction of Truck 2 was split into POAK and Non-POAK-Truck 2 categories. At the time of this analysis, no traffic counts of Port Trucks from traffic measurements or travel models were readily available. Instead, the POAK fraction of Truck 2 was derived from origin-destination (O-D) analyses using the StreetLight InSight platform.[23] The platform simulates trips from Truck 2 vehicles (commercial vehicles) between origin and destination zones based on data from GPS navigation systems installed on the vehicles. A zone can be any size, so long as the geographic extents intersect a roadway. When a zone is drawn as a narrow polygon perpendicular to a roadway, it is often referred to as a "gate." An O-D analysis generates a traffic "index" which quantifies the number of trips between an origin and a destination zone, as well as all trips in each zone independent of trip start or end locations.

In this analysis, it was assumed that all trips originating or ending at the Port were from Port Trucks, which are subject to CARB's Drayage Truck Regulation[24] (i.e., they are POAK vehicles). The entire Port area was designated as a zone, in addition to 49 gates, which were located on highways and surface streets to account for different road types and traffic conditions (including 21 on freeways, 4 on on-/off-ramps, and 24 on surface streets; Figure 2-5). The O-D analyses were conducted for each Port and gate pair. The traffic index between the Port and gate was considered as surrogate of POAK volume, while the traffic index of all trips at gate was considered as surrogate of total Truck 2 volume. Therefore, the fraction of POAK within the Truck 2 category was equal to the POAK traffic index divided by the Truck 2 traffic index. This fraction was assigned to each roadway link based on the spatial proximity of the link to a gate, and then multiplied by the Truck 2 fraction (step (1)) to estimate the fraction of POAK in the entire vehicle fleet. The fraction of Non-POAK-Truck 2 was calculated as the remaining fraction of Truck 2 vehicles. From this, it was estimated that > 75% of the Truck fleet on roadways near or in the Port was composed of POAK vehicles (Figure 2-7).

[23] https://www.streetlightdata.com/.

[24] CARB adopted the Drayage Truck Regulation in 2011 (approved in 2007, changes approved and adopted in 2010; California Air Resources Board 2011b), which requires all Port Trucks to meet or exceed emissions standards for 2007 model year engines. The implementation of the rule has effectively reduced emissions from Port Trucks (e.g., Harley *et al.* 2014).

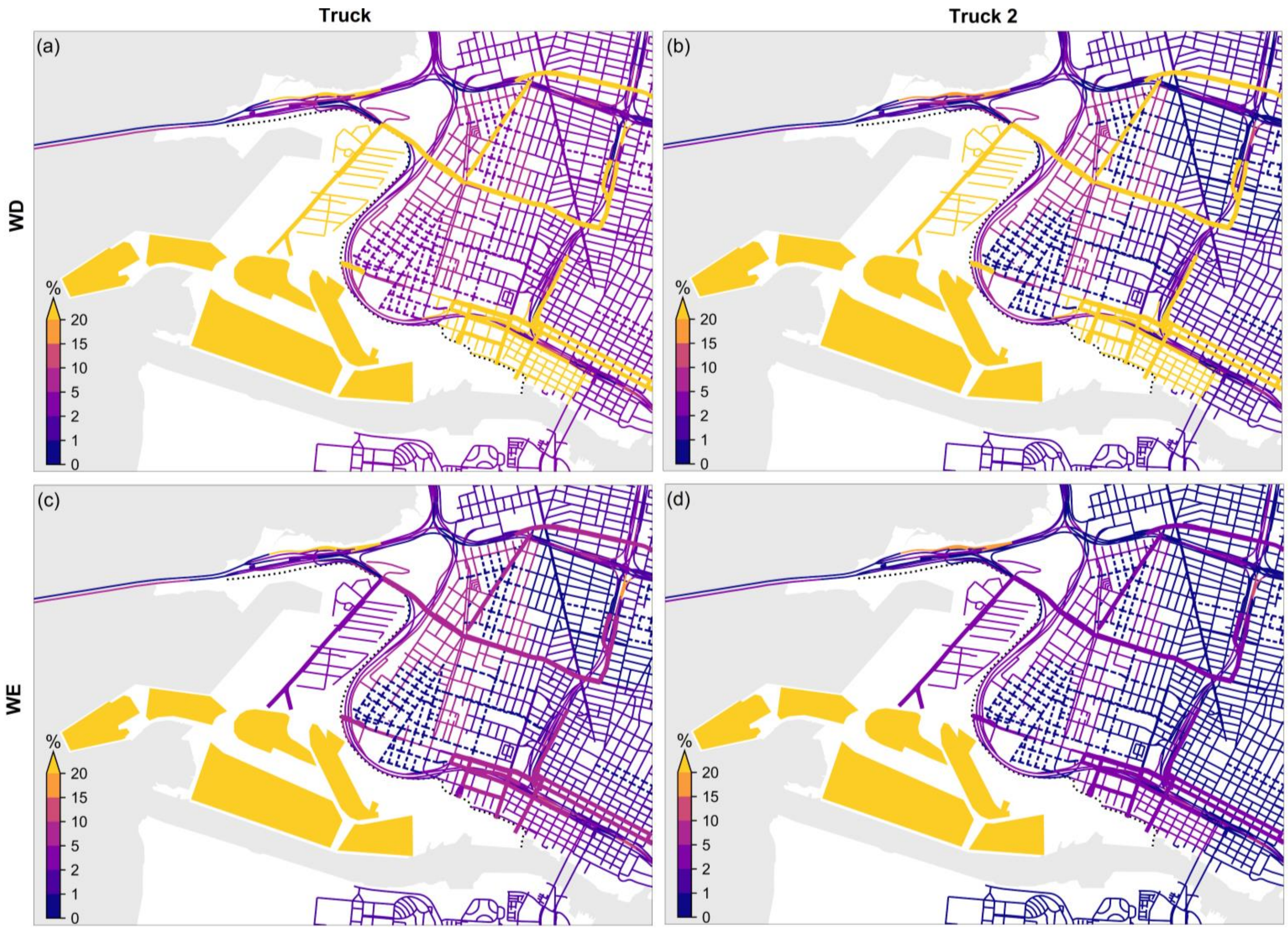


Figure 2-6. Total daily average fleet mix by roadway link in West Oakland for total (a, c) Trucks and (b, d) Truck 2 vehicles by day type (WD, WE). Fleet mix (%) is displayed by roadway (solid line), major truck route (thick solid line), and truck-prohibited route (dashed line). Total fleet volume varies by roadway link. Only roadway segments modeled as volume sources in AERMOD are plotted (*c.f.* Figure 2-1); emissions from on-road mobile sources operating within the Port are plotted as polygons.

Figure 2-7. As in Figure 2-6, but for total daily average POAK percentage of Truck 2 fleet on weekdays.

(c) Fleet Average Vehicle Weight

For each link, average vehicle weight of the vehicle fleet is required to estimate emission factors for road dust. The fleet average vehicle weight is calculated as follows, where subscripts denote vehicle aggregation levels (vehicle type, VT, or vehicle category, VC, where $x \epsilon \{VT, VC\}$):

$$F_{VT} = \frac{VMT_{VT}}{VMT_{VC}}$$

$$F_{VC} = \frac{VMT_{VC}}{VMT_{fleet}}$$

$$W_{VC} = \sum\nolimits_{VT} W_{VT} \cdot F_{VT}$$

$$W_{fleet} = \sum\nolimits_{VC} W_{VC} \cdot F_{VC}$$

where

F_x = VMT-based weighting factor for the vehicle type or category (unitless)
VMT_x = VMT of all vehicles at vehicle aggregation level x (mi)
W_x = weight of vehicle at vehicle aggregation level x (tons)

Therefore, the fleet average vehicle weight is simply the weighted-sum of all vehicle weights. Vehicle weights were taken from the Caltrans-EMFAC2017 (CT-EMFAC2017) tool[25] (California Department of Transportation 2019; using the `Vehicle` table in the underlying CT-EMFAC2017 database).

2.3.3 Emission Factors

Emission factors by emission process were developed for $PM_{2.5}$ and TACs by vehicle category.

(a) Operational Emission Factors

Emission factors from on-road mobile sources are typically estimated using the EMFAC2017 for 2017 Alameda County, using default fleet mix within vehicle categories. As EMFAC2017 does not generate emission factors for TACs, the District leveraged the CT-EMFAC2017, which generates emission factors for $PM_{2.5}$ and mobile source air toxics (MSATs).[26] CT-EMFAC2017 is based on emission factors and activity data from EMFAC2017, while emission factors for MSATs are based on EMFAC2017 data and chemical speciation profiles from CARB and EPA.

CT-EMFAC2017 can generate emission factors for Non-Truck, Truck 1, and Truck 2 categories. Annual average emission factors were obtained for 2017 Alameda County. The emission factors for POAK and Non-POAK-Truck 2 categories were then derived in the following manner:

- For POAK: $PM_{2.5}$ emission factors were obtained directly from CARB's EMFAC2017 web database.[27] A chemical speciation profile for HHDV vehicles from CARB[28] was applied to total organic gases (TOG) emission factors from the EMFAC2017 web database to derive emission factors for each TAC pollutant.

- For Non-POAK-Truck 2: The emission factor of all Truck 2 vehicles can be expressed as the weighted sum of the emission factors from POAK and Non-POAK-Truck 2:

$$EF_{T2} = (F_{POAK} \cdot EF_{POAK}) + (F_{NPT2} \cdot EF_{NPT2})$$

  where EF_x are emission factors for a given pollutant, and F_x are the fleet mix fractions within the Truck 2 category. Then, $PM_{2.5}$ and TAC emission factors can be back-calculated for POAK emission factors (from above), Truck 2 emission factors (from CT-EMFAC2017), and VMT-based vehicle category weighting factors (from the CT-EMFAC2017 database) as follows:

$$F_{POAK} = 1 - F_{NPT2}$$

[25] http://www.dot.ca.gov/env/air/ctemfac-license.html
[26] MSATs in CT-EMFAC2017 include the nine priority pollutants identified by the FHWA within the National Environmental Policy Act (NEPA): 1,3-butadiene, acetaldehyde, acrolein, benzene, DPM, ethylbenzene, formaldehyde, naphthalene, and polycyclic organic matter (POM) (Biondi, 2016). In this analysis, the emissions of these TACs were estimated except for POM (which is a group of compounds and therefore does not have a single associated toxicity value).
[27] https://www.arb.ca.gov/emfac/2017/.
[28] https://www.arb.ca.gov/ei/speciate/speciate.htm.

$$F_{NPT2} = \frac{VMT_{NPT2}}{VMT_{T2}}$$

$$EF_{NPT2} = \frac{1}{F_{NPT2}} [EF_{T2} - (EF_{POAK} \cdot F_{POAK})]$$

This back-calculation approach can be applied to derive emission factors from all emission processes, including emission factors for running loss; while the associated activity is VHT, the VHT-based weighting factor will be equivalent the VMT-based weighting factor (since the travel data used from Citilabs does not distinguish speed by vehicle category).

(b) Road Dust Emission Factors

In this analysis, road dust emission factors were estimated for each roadway link following California Air Resources Board (2016), reproduced below:

$$EF_{fleet} = k \cdot sL^{0.91} \cdot W_{fleet}{}^{1.02} \cdot \left(1 - \frac{P}{4N}\right)$$

where

EF_{RD}	=	road dust emission factor (g/mi)
k	=	particle size multiplier (0.00033 lb/VMT for $PM_{2.5}$)
sL	=	road surface silt loading factor, based on CARB road type (Table 2-11) (g/m^2)
W_{fleet}	=	fleet average vehicle weight (ton)
P	=	number of "wet" (precipitation ≥ 0.01 in) days in averaging period (days) ($P = 41$ days for Alameda County)
N	=	total number of days in averaging period (days) ($N = 365$ days for annual analysis)

Table 2-11. Road surface silt loading factor (sL) by road type used in CARB method to estimate emission factors from road dust emissions. Values taken from California Air Resources Board (2016).

CARB Road Type	sL (g/m^2)
Freeway	0.015
Major/Collector	0.032
Local	0.320

2.3.4 Emissions

For operational emissions from on-road mobile sources, annual average daily emissions were estimated by roadway link by vehicle category (Non-Truck, Truck 1, Non-POAK-Truck 2, POAK), and day type (WD, WE), for each emissions process:

- For running exhaust, tire wear, and brake wear:

$$E_{VC} = \sum_{h=1}^{24} VMT(h)_{VC} \cdot EF(s(h))_{VC}$$

where emissions (E, in g) are summed over all hours (h) of the day (and VMT is a function of hour of day, and for running exhaust, the emission factor is a function of the speed by hour of day).

- For running loss:

$$E_{VC} = \sum_{h=1}^{24} VHT(h)_{VC} \cdot EF_{VC}$$

For road dust emissions, the total fleet annual average daily $PM_{2.5}$ emissions were estimated by roadway link by day type (WD, WE):

$$E_{fleet} = \sum_{h=1}^{24} VMT(h)_{fleet} \cdot EF_{fleet}$$

For each link, the emissions from all processes are summed. The result is an annual average daily emissions inventory by pollutant, by day type, and by vehicle category. The emissions were then converted to emission rates (g/s^2) with corresponding diurnal activity profiles (see Section 3.4.3). The total emissions by vehicle category are reported in Table 2-2.

2.4 Truck-Related Businesses

Numerous “truck-related businesses” are located in West Oakland. These businesses offer Port services, such as truck scales and delivery, or operate a fleet of trucks to support their own business activities. Emissions from idling trucks within the business premises were estimated and included in the emissions inventory; operational and road dust emissions from these trucks are already accounted for as part of on-road mobile source emissions inventory (Section 2.3).

2.4.1 Surveyed Businesses

The District worked with Environmental Defense Fund (EDF) and the Oakland Planning Department to develop a comprehensive list of businesses that may operate a fleet of trucks in West Oakland. The District expanded the initial business list from the 2009 West Oakland Truck Survey (Bay Area Air Quality Management District 2009) to include businesses that were self-registered on the West Oakland Works website[29] and from other field studies performed by EDF. To determine the current level of truck activity at each business, the District sent surveys to the

[29] http://www.westoaklandworks.com/our-directory/.

businesses to determine the average number of truck visits per day and the number of loading docks. The District received responses from 52 of 91 businesses surveyed.[30] Responses from the 2009 West Oakland Truck Survey were used for businesses where the District did not receive a response on the most recent survey. When no information was available, a default of either 5 or 10 trucks per day was used, based on the survey response received from similar business types. Businesses were then removed from the emissions inventory if:

- Emissions from trucks associated with a business were already accounted for under another source category (i.e., trucks operating at terminals or railyards);
- There were ≤ 3 trucks per day at the business; or
- The business did not have an active truck fleet (e.g., truck brokers, marketing companies).

See Attachment 3 for a list of truck-related businesses and truck fleet sizes.[31]

Because businesses were not asked to provide truck fleet mix information in the surveys, the District estimated a default truck fleet based on the results from the 2009 West Oakland Truck Survey (Table 2-12), which includes heavy heavy-duty trucks (HHDT), medium heavy-duty trucks (MHDT), light heavy-duty trucks (LHDT), and Port Trucks (T7 Port of Oakland drayage trucks; T7 POAK). This default was applied to all businesses except for those where the fleet was clearly not representative of the business operation type; for example, all vehicles were assumed to be buses at the Greyhound Bus Terminal, and all vehicles were assumed to be MHDVs at shredding facilities. Fleet mix type by business are also reported in Attachment 3.

Table 2-12. Default fleet mix used for truck-related businesses, as derived from the 2009 West Oakland Truck Survey (Bay Area Air Quality Management District 2009).

Truck category	Percentage of fleet (%)
HHDT	26.5
MHDT	13.5
LHDT	10.0
T7 POAK	50.0

CARB's commercial motor vehicle idling regulation states that all heavy-duty vehicles in California with GVRW ≥ 10,000 lb are prohibited from idling longer than five minutes (California Air Resources Board 2004). However, the regulation allows for longer idling times due to traffic congestion, inspection or service, operating a take-off device, adverse weather conditions, mechanical failure, passenger loading, queuing, or if the engine meets the optional clean idle certification standard. To be conservative, the District assumed that there was 15 min of idling per truck trip.

Emission factors for diesel-fueled truck categories[32] were obtained from EMFAC2017 using a 2017 base year for Alameda County. The emissions were then estimated from each business using the following equation:

[30] District staff visited seven of these businesses in person.
[31] For most truck-related businesses, truck fleet size was used as a surrogate for truck trips.

$$E_i = N \cdot I \cdot EF_i$$

where

E_i = emissions of pollutant i (g)
EF_i = emission factor of pollutant i (g/h)
N = number of vehicles
I = idling time (h) ($I = 0.25$ h)

To calculate the annual emissions, the District assumed that truck-related businesses operated 6 days per week (312 days per year).

2.4.2 Schnitzer Steel

A separate emission inventory for trucking operations was developed for Schnitzer Steel based on its permitted operations. Products are transported by trucks to bulk carriers which dock at the Schnitzer Steel deep-water terminal.

The District currently limits the number of trucks that can operate at Schnitzer Steel;[33] in 2017, there were 47,320 truck trips to the facility (approximately 152 truck trips per day, assuming six days of operation per week; see Section 3.4.4). Although there are no restrictions on the type of trucks that can operate at Schnitzer Steel, for this assessment, the District assumed that all trucks were diesel fuel MHDTs and HHDTs (modeled as either Non-POAK-Truck 2 or heavy-heavy duty diesel single unit truck (T7 Single, which usually has the highest emission factors of all T7 vehicles in EMFAC2017); the vehicle category varied depending on the emission factor available at the time of analysis, and are summarized in Table 2-13.

Unlike for the other truck-related businesses in the West Oakland emissions inventory, because of the size and characteristics of the property, emissions from trucks operating at Schnitzer Steel included driving-related emissions. Emissions due to running exhaust, idle exhaust, tire wear and brake wear (for PM), and road dust were calculated for Schnitzer Steel using the following assumptions: (1) there were 47,320 truck trips, (2) each truck idled for 15 min on the property (to be conservative), (3) each truck drove 800 m on the property (two-times the approximate length of the property, from the entrance to near the ship berth), (4) trucks drove at 10 mph on the property (consistent with the average truck speed of trucks driving within terminals at the Port; Ramboll 2018), (5) trucks drove on unpaved roads, which were modeled as Local Roads for the purposes of calculating re-entrained road dust (Table 2-11). Emissions were calculated as in Section 2.3.4, and are summarized in Table 2-13.

---

[32] From EMFAC2017, emission factors for LHDT are based on that of LHD1 (which are highest among all LDVs), and emission factors for HHDTs are based on the composite of emission factors for all T7 vehicles except T7 POAK (Port Trucks).
[33] Schnitzer Steel's current permit is for 63,875 truck trips per year.

Table 2-13. Emission estimates from trucks operating at Schnitzer Steel in 2017 by emission process. The Fleet indicates the EMFAC2017-based fleet from which the emission factor was derived. A hyphen (–) indicates that emissions from the emission process are not applicable.

Process	Fleet	Emissions (tpy)	
		$PM_{2.5}$	DPM
Running exhaust	Non-POAK-Truck 2	0.0073	0.0076
Idle exhaust	T7 Single	0.0034	0.0036
Tire wear	Non-POAK-Truck 2	0.0002	–
Brake wear	Non-POAK-Truck 2	0.0010	–
Road dust	Non-POAK-Truck 2	0.0267	–
Total		0.0386	0.0112

2.5 Ocean-Going Vessels

Emissions from OGVs were estimated for active terminals at the Port and the privately-owned terminal operated by Schnitzer Steel. Emissions from OGVs include emissions from transiting, maneuvering, and berthing. OGVs use propulsion engines for transiting, auxiliary engines for on-board electrical power, and small boilers to meet steam and hot water demands.

2.5.1 Port of Oakland

In 2017, OGVs calling at the Port were exclusively container ships, including some with the capability to handle roll on/roll off cargo. All ship calls in 2017 were exclusive to the Port and did not include visits to other ports. An estimated 1,596 vessel voyages[34] to the Port were reported in the 2017 Port inventory. Many vessels follow regular route and schedules; 66% of the total calls were from vessels visiting 4 to 10 times in 2017, while 15% of total calls were from vessels visiting 11 or more times. Most of the vessels are relatively new; 85% were built since 2000, and the call-weighted median age of vessels was 9 years old.

Vessel call data were provided by the Marine Exchange of San Francisco Bay Region (SFMX). This dataset included the vessel identification number, Port berth, and date and time of the beginning and end of each movement, from which the time at berth (time between 'first line on' and 'last line off') and at anchor was inferred. The vessel identification numbers were cross-referenced with data obtained from the 2018 IHS Fairplay database,[35] which contains vessel characteristics such as vessel build date (which was used to estimate the emissions control regulations for the engine, which in turn determines the emission factor), cruise speed, engine type, and installed power. These parameters affect estimates of engine load for each vessel call. Actual

[34] Vessel voyages account for inbound/outbound trips, whereas calls to the Port represent the number of berthing events (there can be multiple calls per voyage, e.g., when a vessel moves between berths at the Port).

[35] Ramboll (2018) extracted data from IHS Fairplay (Bespoke Maritime Data Services, Ship Data) on February 15, 2018.

vessel speed profiles (travel time by speed bin) were obtained from the Automatic Identification System (AIS),[36] provided by SFMX.

OGVs use propulsion engines for transiting, auxiliary engines for on-board electrical power, and small boilers to meet steam and hot water demands. Pollutants are emitted based on the operating mode of each OGV. Common modes include open ocean cruising, cruising at reduced speed (in the reduced speed zone [RSZ]) in the Bay, maneuvering (lower speed operation near berths), and hoteling (at berth). RSZ mode occurs after the bar pilot takes command of the vessel at the sea buoy until the vessel slows to a maneuvering speed directly in front of the Port. During hoteling, the main engines are turned off but the auxiliary engines are running. For this analysis, the District included emission from:

- Vessels transiting between the Port and the entrance to San Francisco Bay,
- Low speed vessel maneuvering south of the Bay Bridge within the West Oakland Source Domain, and
- Berthing at the Port.

Emissions associated with cruising from the open ocean and most of the RSZ emissions were excluded since these emissions are outside of the Source Domain.

Emissions were determined for each transport mode based on the engine rated power (the maximum power that the engine can produce), typical load factor (the fraction of the actual to the rated power that the engine operates for a given mode), and time elapsed at that load. Emissions per vessel were calculated from propulsion engines, auxiliary engines, and boilers using the emissions factors and methods from CARB (California Air Resources Board 2011c, as amended by California Air Resources Board (2014b) and CARB's Marine Emissions Model v2.3L [California Air Resources Board 2014a]) as follows:

$$E_i = EF_i \cdot e \cdot LF \cdot T_O$$

where

E_i	=	emissions of pollutant *i* (g)
EF_i	=	emission factor of pollutant *i* (by engine type, operating mode, and fuel type) [g/(kW h)]
e	=	rated power (maximum power the engine can produce) (kW)
LF	=	load factor (unitless)
T_O	=	operating time in mode (h)

Data from the 2018 IHS Fairplay database indicate that the most common propulsion engines used on vessels calling at the Port in 2017 were slow speed engines (2-stroke engines, typically lower than 200 rpm) followed by steam engines powered by boilers for the remaining ships. Emission rates assuming 0.1% fuel sulfur content were used based on CARB fuel regulation except for

[36] AIS data were available from June through December 2017. These data were used to calculate speed distributions. It is assumed that data during this period are representative of OGV transiting behavior over the whole year.

steamships for which 2.7% sulfur content was used. Emissions factors for DPM (based on emission factors for PM_{10}) and $PM_{2.5}$ used for each OGV engine type are presented in Table 2-14.

Table 2-14. OGV DPM and $PM_{2.5}$ emission factors by engine and fuel type. From Ramboll (2018), based on California Air Resources Board (2014a).

Engine Type	Fuel Type	Emission Factor [g/(kW h)]	
		DPM	**$PM_{2.5}$**
Slow speed	Marine distillate (0.1% sulfur)	0.250	0.230
Steam	Marine distillate (2.7% sulfur)	0.800	0.780
Auxiliary	Marine distillate (0.1% sulfur)	0.250	0.230
Auxiliary boiler	Marine distillate (0.1% sulfur)	0.133	0.130

Load factor for the propulsion power were determined using Stokes Law:

$$LF = (s/s_{\max})^3$$

where

LF = load factor (unitless)
s = vessel speed
$s_{\max}$ = vessel maximum speed

The speed and maximum speed of the vessel must be expressed in the same units. A load factor of 100% corresponds to the vessel operating at its maximum speed. When the vessel is cruising, the vessel cruise speed is assumed to be equal to its design speed, which is 93.7% of its maximum speed. Using the equation above, this results in a load factor of 0.823. The load factor varies depending on the vessel's speed during other modes. Adjustment factors were also applied to obtain emission factors applicable to operation at low loads where the engine does not operate as efficiently.[37]

Emissions from maneuvering estimated for in areas inside the Source Domain only. Vessels were assumed to be in maneuvering mode while moving between the Bay Bridge and the Port berths. This mode consists of short low speed transits, turns at the berth or in the turning basins, and a start and stop of the propulsion engine at the berth with tug assist. Maneuvering time is shorter for the Outer Harbor terminal calls (Berths 24 through 37) than the Inner Harbor terminal calls (Berths 55 through 68) because of the shorter distance from the Bay Bridge and proximity of the Outer Harbor turning basin to the Outer Harbor berths. Larger ships also require more time to turn. The time from the beginning to the end of the maneuvering mode was obtained from SFMX; 0.25 h were added to account for propulsion engine start up and shut down. The 0.75 h per shift (when a vessel moves between berths or from berth to anchorage) was also included in the emission estimates. Emissions associated with occasional vessel shifts between berths or between anchorage and berth were included in the maneuvering total for purposes of spatial allocation.

[37] This is consistent with the approach used in the 2014 Port of Los Angeles Inventory (Ramboll 2018).

Vessel auxiliary power is primarily used when propulsion engines are not running (e.g., at berth or in anchorage outside of the Source Domain). Vessel auxiliary power was derived from auxiliary generator capacity taken from the 2018 IHS Fairplay database or estimated from a comparable ship (by size and owner) if data were not available. The auxiliary engine load factors were assumed to be 50% for maneuvering and 18% for hoteling (California Air Resources Board 2011c). The running time of the auxiliary engine was estimated from each vessel call. For calls without shoreside power, the hoteling time was equal to the time at berth.

The at-berth time was determined from the SFMX berth report. In 2017, the average berthing time was 25 h per call. Emission reductions as a result of alternative marine power usage were addressed in the calculation of hoteling emissions by subtracting the time when shore power was used from the berthing time. When shore power is connected, the energy usage billed and connection time (hours) are recorded, thus affording an estimate of average load demanded. The use of shore power represents greater than 50% reduction in auxiliary engine operating hours at berth overall and resulting in 40–50% reduction in emissions for all pollutants. Auxiliary engine load at berth is equal to 1,147 kW based on the average shore power demand observed in 2017. Data from the Port for shore power calls in 2017 indicate that the average in-use power demanded was 10.5% of the auxiliary generator capacity for the significant shore power connections.

In-use boiler power estimates of 506 kW for container ships were assumed based on CARB's Marine Emissions Model v2.3L. Boiler emission factor of 0.133 g/(kW h) for DPM (PM_{10}) was used (assuming 0.1% sulfur content fuel).

Emissions from OGV maneuvering (within the Source Domain) and berthing are summarized in Table 2-15. Propulsion steam and auxiliary boiler PM emissions are not included in the DPM total because they are not generated by diesel engines.

Table 2-15. $PM_{2.5}$ and DPM emissions from OGV maneuvering and berthing by terminal. The District only included emissions from dredged disposal that was within the Source Domain (the emissions presented in this table are lower than those reported in the 2017 Port Inventory).

Terminal	Maneuvering (tpy)		Berthing (tpy)	
	$PM_{2.5}$	**DPM**	**$PM_{2.5}$**	**DPM**
TraPac	0.657	0.640	1.432	1.033
Nutter	0.376	0.366	0.818	0.590
OICT	2.650	2.578	5.770	4.162
Matson	0.262	0.255	0.571	0.412

2.5.2 Schnitzer Steel

Schnitzer Steel receives only bulk carriers calling for scrap steel. Emissions from vessel voyages associated with calls at Schnitzer Steel are not included in the Port's maritime inventory because the Schnitzer facility is not owned or controlled by the Port of Oakland. Similar to the emissions inventory developed for the Port (Ramboll 2018), emissions from OGVs operating from Schnitzer Steel were estimated based on the rated power and load factor of each vessel, duration of each trip, and the pollutant-specific emission factors during transiting, maneuvering, and hoteling. Emissions from container ship assist tugs (harbor craft) used to assist cargo vessels movements upon arrival and departure from the terminal were included in the OGV emissions. The District current limits the number of ship calls to Schnitzer Steel on an annual basis;[38] in 2017, there were 26 ship calls. $PM_{2.5}$ emissions were used as a surrogate to represent DPM emissions. No temporal variations were estimated for OGV trips.

Due to confidentiality agreement, the District cannot release specific parameter information used to derive the OGV emissions for Schnitzer Steel. Emission factors for the main and auxiliary engines were taken from California Air Resources Board (2011c). Emission factors for auxiliary boiler operations were taken from the Port of Los Angeles Inventory of Air Emissions for 2017 (Starcrest Consulting Group, LCC 2018). Emission factors for harbor craft emission factors were taken from California Air Resources Board (2012b). Based on CARB fuel regulations, emission factors were based on fuel with 0.1% fuel sulfur content. Estimates of emissions were limited to within the Source Domain; transport outside of the domain were not estimated or modeled. The total emissions are summarized in Table 2-16.

Table 2-16. $PM_{2.5}$ and DPM emissions from OGVs operating at Schnitzer Steel.

Activity	$PM_{2.5}$ (tpy)	DPM (tpy)
Transiting	0.0598	0.0598
Maneuvering	0.0874	0.0874
Hoteling	0.1553	0.1553
Total	0.3024	0.3024

2.6 Commercial Harbor Crafts

CHCs are regularly used at the Port to support: (1) operation and maintenance dredging in the channels and at berths, (2) disposal of dredged material, (3) container ship assist tugs, and (4) tug trips and fuel pumping from fuel barges towed from Richmond to refuel ships' bunkers at the Port. Most CHCs at the Port are tugs; otherwise, there are a few small work boats that assist dredging operations, and dredgers.

2.6.1 Operation and Maintenance Dredging and Disposal

Operation and maintenance (O&M) dredging is conducted annually at the Port to maintain the depth of channels and berths and to ensure safe navigation. Materials that are deposited into the Bay by stream and urban runoff are removed, and shallow areas are eliminated by redistributing the bottom sediments from shoaling. Dredging is conducted using diesel-powered derrick barge (clamshell) dredgers, accompanied by tender tugs and work boats. Dredged material is transferred to scows (barges), which are then towed to a disposal site by a diesel-powered tug. After the barge is emptied, the tug returns with the empty barge to pick up a new load.

[38] Schnitzer Steel's current permit is for 32 ship calls per year.

Recent channel dredging was conducted from August 2017 into February 2018, while berth dredging was conducted in August, October, and the first two weeks of November 2017. During this period, 89,000 cubic yards of material from the Port's berth and 559,000 cubic yards of material from the channel were removed and disposed of at the San Francisco Deep Ocean Disposal Site, located 49 nmi west of the Golden Gate Bridge. These activities were treated as two separate activities in the 2017 Port Inventory: (1) O&M dredging, which includes operation of the clamshell dredge and associated support vessels, and (2) disposal, when dredge materials are transported from the dredging area to disposal sites. Only disposal was inside the Source Domain was included in this analysis (which includes only ~2.3 nmi of transit distance, or ~9.4% of total transiting emissions).

Emissions from dredging equipment was estimated as follows:

$$E_i = EF_i \cdot e \cdot LF \cdot T_O$$

where

E_i	=	emissions of pollutant *i* (g)
EF_i	=	emission factor of equipment of pollutant *i* [g/(bhp h)]
e	=	engine brake horsepower rating (bhp)
LF	=	time-weighted engine load factor (fraction of full load) based on different operating modes during a round trip (unitless)
T_O	=	operating hours of equipment (h)

The dredging contractor provided a list of dredging equipment, engine characteristics, and hours of operation. In 2017, dredging operations were performed using clamshell dredge on a dredge barge (using a main and auxiliary diesel engine), and dredge tenders and work boats (each with two main propulsion diesel engines, and up to two auxiliary engines). Specific information on engine model, power, load factor, emissions factors, and hours of operation are provided in the 2017 Port Inventory. Vessel emission factors, deterioration factors, fuel correction factors, and load factors from CARB's Commercial Harbor Craft Emission Inventory tool (California Air Resources Board 2011a) were used to estimate emissions for all engines used on the dredging and support vessels. Emission factors for the dredgers were derived from CARB's OFFROAD model,[39] which are based on the model year and age of equipment (in 2017). Emission factors for diesel engines on tugs and tenders were estimated based on load factors, zero-hour emission factors, and deterioration factors available in California Air Resources Board (2011a). The resulting emissions are presented in Table 2-17.

[39] See https://ww3.arb.ca.gov/msei/ordiesel.htm for more information.

Table 2-17. Emissions of $PM_{2.5}$ and DPM from O&M dredging and disposal of dredge material. The District only included emissions from dredged disposal that was within the Source Domain (the emissions presented in this table are lower than those reported in the 2017 Port Inventory).

Activity	$PM_{2.5}$ (tpy)	DPM (tpy)
O&M Dredging	1.080	1.11
Dredge disposal	0.043	0.04

2.6.2 Assist Tugs

Tugs are used to assist cargo vessel movements upon arrival, berthing, and departure from the Port, and tow or push a wide variety of barges and other equipment. Assist tugs ensure safe navigation within the Bay, especially when vessels are reversing direction near berths in the Inner and Outer Harbor. Tugs are matched to vessels to ensure they are equipped to handle the vessel based on their size, power level, etc. On average, two tugs are used for each cargo vessel that are inbound or outbound between berths at the Port and the Federal Channel near the Bay Bridge, though up to five tugs are required to assist larger vessels. Emissions from assist tugs were estimated for when they were (1) assisting vessel operation, and (2) transiting to and from berthing bases to conduct the assists.

Tugs assigned to ships calling at the Port are operated by five companies: AMNAV, Foss Maritime, Starlight Marine (part of Harley Marine Services), Crowley, and BayDelta. Vessel call data specific to the Port was provided by SFMX. The activity of each company in 2017, based on the number of calls to the Port, are reported in Table 2-18. Although these tugs are used elsewhere in the Bay, emissions were only estimated for activity during transiting and assisting ship calls at the Port.

Table 2-18. Activity (percentage of total calls) of assist tugs calling to the Port by operator. The base indicates where the company bases their operations (at/near). Based on calls to the Port in 2017.

Operator	% calls	Base
AMNAV	78	Berth 9, Port of Oakland
Starlight Marine		Alameda side of Inner Harbor Turning Basin
Foss Maritime	7	Richmond
Crowley	8	Bay Bridge, San Francisco
BayDelta	8	Bay Bridge, San Francisco

Assist tugs emissions were estimated based on the methods presented in California Air Resources Board (2011a). The equation used to estimate emissions from each assist tug class was as follows:

$$E_i = AEF_i \cdot e \ \cdot LF \ \cdot \ T_O$$

where

E_i = emissions of pollutant i (g)

AEF_i = adjusted emission factor of pollutant i for main or auxiliary engine (adjusted for model year, deterioration rate, and fuel, averaged by tug class) [g/(bhp h)]

e = engine brake horsepower rating, as a weighted average between main propulsion and/or auxiliary engine brake horsepower rating of engines in the tug class (bhp)

LF = time-weighted engine load factor (fraction of full load) for the maneuvering phase for the main engine and/or auxiliary engine (unitless)

T_O = operating hours by tug class (based on number of vessel calls, average maneuvering time per call, average number of tugs assigned to each assist by inbound/outbound direction) (h)

The characteristics of tugs by company that were in operation in 2017 were obtained, including: engine model year, main engine power and tier regulation, and auxiliary power. The total assists by company were evenly distributed among individual tugs. Maneuvering time was estimated for each call based on the Port berth location and the vessel length. Time transiting to and from assists for each tug was estimated using the distances from each operator's base (Table 2-18) to various assist destinations, assuming the transit trips were made at an average speed of ~ 9.2 mph (8 kt). For each trip, emissions were calculated for inbound vessels assuming 2.20 tugs, and for outbound trips using 2.08 tugs. Time for each assist including maneuvering ships inbound and outbound from the Port and transiting to and from maneuvering assists.

Zero-hour emission factors, engine emissions deterioration factors, and fuel correction factors for both main propulsion and auxiliary engines were based on California Air Resources Board (2011a). The engine load factor for main engines and auxiliary engines was 0.31 and 0.43, respectively.

The total emissions from assist tugs are presented in Table 2-19.

Table 2-19. $PM_{2.5}$ and DPM emissions from assist tugs.

Operator	$PM_{2.5}$ (tpy)	DPM (tpy)
AMNAV BayDelta Crowley Foss Maritime	2.82	2.91
Starlight Marine	0.81	0.84

2.6.3 Bunkering Barges

Bunkering is when ships are supplied with fuel. At the Port, tugs tow fuel barges from Richmond to refuel ships at berth. The bunkering barge was towed from and returned to the Richmond long wharf, approximately 10 nmi from the Port; only the portion of the bunkering trip from the Port to Richmond within the Source Domain (a distance of ~1.8 nmi) was used to estimate the emissions. Foss Maritime provided the date and fuel costs for bunkering events in 2017, which was used to develop the emissions inventory for this activity.

Bunkering emissions were estimated using the same approach as that described for dredging (Section 2.6.1) since each operation involves a barge and an accompanying tug. The tug load and time in mode for movement of the bunkering barge were used to estimate the emissions during the transit trip. Emissions from the tug used to tow the fuel barge between Richmond and the Port were estimated following the method used to estimate emissions from tugs towing dredge material for disposal (Section 2.6.2). Emissions from the barge-mounted diesel-powered pumps were estimated using the emission rate for pumps in CARB's OFFROAD model.

A total of 314 bunkering events occurred in 2017 across 219 unique dates. This means that, for the 95 events that occurred on the same day as another event, there was likely no return trip to Richmond between events. Therefore, only 219 round trips to Richmond from the Port were accounted for in the emissions analysis.

Assuming the one-way trip from Richmond to the Port takes 2.5 h, the total operating hours for towing barges for bunkering was 1,095 h. Time to refuel ships took up to 8 h. Taking the travel time and time required to refuel, the average bunkering event was assumed to take 4 h for pumping (1,256 h of pumping for all 314 bunkering events). Pumping was performed by two 500 hp model year 2003 diesel barge pumps using non-road Tier 2 engines. The propulsion and auxiliary engine model year and power for the two tugs used to tow the bunkering barges are presented in the 2017 Port Inventory.

Total emissions for the bunkering operation to tow boats and barge pumps are shown in Table 2-20.

Table 2-20. $PM_{2.5}$ and DPM emissions from bunkering barges and pumps by terminal operator.

Terminal	Bunkering Barges (tpy)		Bunkering Pumps (tpy)	
	$PM_{2.5}$	DPM	$PM_{2.5}$	DPM
TraPac	0.01430	0.01000	0.01260	0.01000
Nutter	0.00815	0.01000	0.00718	0.01000
OICT	0.05750	0.05930	0.05060	0.05500
Matson	0.00569	0.00586	0.00501	0.00544

2.7 Cargo Handling Equipment

CHE is primarily used to transfer freight between modes of transportation, such as between marine vessels and trucks or between trains and trucks. At the Port, CHE are used almost exclusively to move shipping containers. As such, the types of CHE at the Port are limited to yard tractors, rubber-tired gantry (RTG) cranes, top or side handlers (also called picks), and forklifts. Other types general purpose CHE, such as sweepers, bulldozers, backhoes, excavators, and other off-road equipment, were not included as part of the CHE category since they are used at the Port for facility maintenance and construction. A more detailed explanation of emissions estimates can be found in the 2017 Port Inventory report.

Annual 2017 emissions for each piece of CHE equipment were estimated at each Port terminal based on the equipment type, engine characteristics (model year, rated power, after-treatment retrofit control device), and equipment operation (hours of operation, fuel consumption rate). Equipment population and operation estimates were derived from surveys of on-dock terminal, off-dock terminal, and railyard activity conducted by the Port in late 2017 and early 2018.

The types of equipment were used to categorize CHE consistent with CARB guidance (California Air Resources Board 2011d) include cranes (including rubber-tired gantry cranes), forklifts, container handling equipment (top or side handlers), and yard trucks (or yard tractors). Annual emissions from CHE were calculated using the following equation for equipment in these categories as:

$$E_i = [EF_i + (dr \cdot T_C)] \cdot e \cdot FCF \cdot LF \cdot CF \cdot T_O \cdot N$$

where

E_i	=	emissions of pollutant i (g)
EF_i	=	zero-hour emission factor of equipment [g/(bhp h)]
dr	=	deterioration rate or increase in zero-hour emissions as the equipment is used [g/(bhp h)/h]
T_C	=	cumulative hours of equipment use (h)
e	=	engine brake horsepower rating (bhp)
FCF	=	fuel correction factor (percent reduction) used to adjust the base emission factor to account for use of California diesel fuel (unitless)
LF	=	weighted load factor (average load expressed as a percent of rated power) (unitless)
CF	=	control factor (percent reduction) associated with use of emission control technologies (unitless)
T_O	=	annual operating hours of the equipment (h)
N	=	number of pieces of the equipment

The Port sent confidential surveys regarding equipment make and model to all tenants on-dock and off-dock of the BNSF railyard. When information was missing from the survey, assumed default values based on similar make and model of equipment and hours of operation were used.

For diesel-powdered CHE, zero-hour emission factors, deterioration rates, fuel correction factors, and emission control factors were obtained from CARB's 2011 Cargo Handling Equipment Inventory (CHEI) model (California Air Resources Board 2012a). Because the current version of the CHEI model does not support emission estimates for non-diesel equipment, emission factors for gasoline and propane powered equipment were obtained from CARB's 2011 CHE Calculator (California Air Resources Board 2011d), following the methodology described in the 2005 original rulemaking for CHE operating at ports and intermodal railyards (California Air Resources Board 2005a).

Of the 386 total pieces of CHE, 345 were diesel-powered, 39 were gasoline-powered, and 2 were liquid petroleum gas-powered (Table 2-21). Summary of the average horsepower, annual operating hours by equipment and power range can be found in the 2017 Port Inventory.

Table 2-21. CHE equipment types used at the Port, based on survey results.

Equipment	Equipment Population	% Total
Container handling equipment (top picks and side picks)	123	32
Forklift	14	4
RTG Crane	24	6
Yard Tractor	105	27
Yard Tractor (on-road)	120	31

Emissions were split between on-dock and off-dock operations, based on the mix of equipment types used at the marine terminals as compared to the BNSF railyard. Approximately 83% of DPM and $PM_{2.5}$ emissions were associated with the marine terminals, while the remaining 17% were from the BNSF railyard. CHE emissions were further assigned to each terminal based on the proportion of ship calls made to each terminal in 2017. Emissions from CHE by terminal and yard and the hours of operations are summarized in Table 2-22 and Table 2-23, respectively. All PM_{10} from diesel engines were assumed to be DPM, and $PM_{2.5}$ emissions were calculated as a fraction of PM_{10} based on the fuel type-specific factors provided in California Air Resources Board (2013).

Table 2-22. $PM_{2.5}$ and DPM emissions from CHE by location (terminal or railyard).

Location	Emissions (tpy)	
	$PM_{2.5}$	DPM
TraPac Terminal	0.220	0.22
Nutter Terminal	0.126	0.12
OICT Terminal	0.886	0.88
Matson Terminal	0.088	0.09
BNSF Railyard	0.270	0.27

2.8 Port Trucks at Terminals

Port Trucks, or “drayage trucks,” transport containers between marine terminals, freeway interchanges, and nearby railyards. Port Trucks travel along truck routes between marine terminals, three nearby freeway interchanges, and two railyards (UP and BNSF). Trucks can only arrive or depart from the Port area via three freeway access points: Maritime Street/West Grand Street, 7th Street, and Adeline Street (via the Adeline Street and Market Street on/off-ramps to I-880).

Table 2-23. Terminal operating hours used to develop temporal activity profiles for CHE. Information as of January 25, 2019.

Location	Day of week			
	Monday - Thursday	**Friday**	**Saturday**	**Sunday**
TraPac Terminal	7:00 AM – 12:00 PM 1:00 PM – 4:30 PM 6:00 PM – 2:00 AM	7:00 AM – 12:00 PM 1:00 PM – 4:30 PM	None	None
Nutter Terminal	7:00 AM – 4:15 PM	7:00 AM – 4:15 PM	None	None
OICT Terminal	7:00 AM – 3:00 AM	7:00 AM – 6:00 PM	None	None
Matson Terminal	8:00 AM – 11:45 AM 1:00 PM – 4:45 PM	8:00 AM – 11:45 AM 1:00 PM – 4:45 PM	None	None
BNSF Railyard	6:00 AM – 6:00 PM	6:00 AM – 6:00 PM	7:00 AM – 4:00 PM	None

To calculate total emissions from Port Trucks operating at terminals, vehicle operating modes were separated into four categories: (1) idling inside marine terminals, (2) idling at gate queues, (3) driving within marine terminals, and (4) driving on surface streets between terminals and freeways interchanges or railyards. For each of these modes, the average time and travel speed determine the emissions for each trip. Emissions per trip were calculated by multiplying the appropriate emission factor (idling or by speed bin) by the activity level indicator (idling time or travel distance). For running exhaust, emissions are calculated as:

$$E_i = N \cdot L \cdot EF_i$$

where

E_i = emissions of pollutant *i* (g)
EF = emission factor of pollutant *i* (g/mi)
N = number of vehicles (unitless)
L = travel distance (mi)

For idling exhaust, emissions were calculated in the same manner as presented in Section 2.4.

Details regarding the method used to estimate each of the emissions parameters are provided in the 2017 Port Inventory. The 2017 truck trip counts at the marine terminals were derived from gate counts (as provided by the Port or the terminal operators) and container lift counts (i.e., the number of containers moved on or off a ship). In the railyards, the reported number of lifts was doubled to estimate the sum of inbound and outbound truck trips. However, trucks may move a container in and out on a single terminal entry or reposition an empty chassis so that the gate counts do not exactly match the number of container lifts. The counts do not include trips to truck parking areas in the Port (such as the former Ports America Outer Harbor terminal and Howard Terminal) since the trucks were already counted when they entered at one of the three access points.

VMT within marine and rail terminals is limited to driving between the terminal gates and container storage areas. Previous surveys of terminal operators conducted by the Port was used to estimate 2017 activity including truck speed, travel distance, and idling time (Table 2-24).

Table 2-24. Average activity level for Port Trucks at terminals. Values are estimated from surveys conducted in 2005 and 2012 and terminal trip activity in 2017.

Mode	Average value
Idling at gate (h)	0.14
Idling in terminal (h)	0.34
Distance traveled (mi)	2.54
Speed (mph)	13.5

Emission factors for truck running exhaust, extended idling, tire wear, and brake ware were taken from EMFAC2017. Emission factors from on-road trucks depend on the age distribution of the trucks and site conditions such as temperature, humidity, fuel sulfur, and average speeds. Port Truck hours of operation were assumed to be the same as those for CHE (Table 2-23).

In 2017, all Port Trucks used diesel fuel; PM_{10} running exhaust emissions are therefore DPM emissions, but total PM_{10} and total $PM_{2.5}$ also include (non-diesel) PM from brake wear, tire wear, re-entrained road dust. DPM emissions by terminal were back-calculated from total DPM emissions associated with Port Truck trips and the fraction of activity based on ship calls by terminal. Total $PM_{2.5}$ emissions in the 2017 Port Inventory do not include road dust emissions; to estimate these emissions, the District first separated idling exhaust emissions from "driving emissions" (running exhaust, tire wear, brake wear) based on the fraction of emissions by activity by terminal (provided by Till Stoecknenius, Ramboll, personal communication, 12 June, 2019). Using emission inventories developed for Port Trucks on roadways within the Port area (Section 2.3), an average ratio of 4.76 (across all roadways links) of road dust emissions to "driving emissions" was obtained. This ratio was then applied to the "driving emissions" within the Port terminals to obtain $PM_{2.5}$ road dust emissions.

The spatial allocation of Port Truck emissions was based on the percentage of emissions between marine terminals and the railyards (Table 2-25). Port Truck emissions were further assigned to each terminal based on the proportion of ship calls made to each terminal in 2017. Consistent with the 2017 Port Inventory, it was assumed that two-thirds of Port Truck travelling to railyards went to the UP railyard, while the remaining one-third went to the BNSF railyard. The emissions by terminal are reported in Table 2-26.

Table 2-25. Emissions allocated by Port Truck terminal type trip destination. Information provided by Ramboll (Till Stoecknenius, Ramboll, personal communication, 25 February, 2019).

Terminal type	Emissions (%)	
	$PM_{2.5}$	DPM
Marine	87	88
Railyard	13	12

Table 2-26. $PM_{2.5}$ and DPM emissions from Port Trucks operating at Port terminals. $PM_{2.5}$ emissions include all operational and road dust emissions. Total values are consistent with Ramboll (2018), with the exception of added $PM_{2.5}$ road dust emissions.

Terminal type	Location	Emissions (tpy)	
		$PM_{2.5}$	DPM
Marine	TraPac	0.398	0.038
	Nutter	0.227	0.022
	OICT	1.602	0.154
	Matson	0.158	0.015
Railyard	BNSF	0.115	0.011
	UP	0.230	0.021
	Total	**2.730**	**0.261**

2.9 Locomotives (Rail Lines)

The geographical locations of rail lines in the Bay Area was available in a shapefile from the Topographically Integrated Geographic Encoding and Referencing (TIGER) Line spatial database.[40] When the shapefile was transposed onto satellite imagery (as viewed in Google Earth), the locations of the lines did not align with visible rail lines; in some cases, they were misaligned up to ~90 m. The rail lines in the shapefile were then manually re-aligned to match the satellite imagery.

In the shapefile, each rail line is made up of many smaller segments that span short distances (0.81–3.8 mi) along each track. In the Bay Area, passenger and freight services may run along a single track (i.e., the track is shared by both services), or along parallel tracks. To determine the cumulative impacts from all rail services on West Oakland, emissions from parallel tracks were consolidated onto a single track (see Figure 3-15). In addition, emissions from locomotives that perform switching operations (referred to as “switchers”, which move individual or a small number of rail cars to assemble trains) were evenly distributed along the length of the subdivision line.

In total, emissions were estimated on six rail segments within West Oakland Source Domain. Emissions along each segment represent the combined emissions from all services, though in the following sections (Section 2.9.1 and 2.9.2), emission estimates are presented by service.

Because of the limited data available, the District was not able to include emissions from rail sidings. Emissions from railyard activity were evaluated separately (see Section 2.10).

2.9.1 Freight Haul Lines

Only rail lines within the Source Domain were included in this analysis (Table 2-27). There are two freight rail carriers in the Bay Area: BNSF, and UP. Both freight lines transport goods to and

[40] https://www.census.gov/geographies/mapping-files/time-series/geo/tiger-line-file.html.

from the Bay Area to San Joaquin Valley (east), Sacramento (north), and down the Peninsula (south).

Table 2-27. Freight subdivision lines in Alameda County.

Subdivision	Start Location	End Location
Martinez	10th Street, Oakland	Alameda County Line
Niles	10th Street, Oakland	Newark

BNSF and UP provided the District with the average diesel fuel consumption and miles traveled in 2017 along each county subdivision line in the Bay Area, and EPA fuel-based emission factors (g/gal) for converting fuel consumption to emissions. The railroad companies provided combined fuel consumptions along rail lines that are shared by both carriers. Emissions from switchers were included in the fuel-based emissions estimates and distributed uniformly across specific subdivision lines. The total emissions from freight haul lines was 0.454 tpy of DPM and 0.426 tpy of $PM_{2.5}$ (assuming a size fraction of 0.94).

2.9.2 Passenger Rail Lines

There are several intercity passenger rail lines within the Source Domain, which are serviced by Amtrak along the Capital Corridor, California Zephyr, Coastal Starlight, and San Joaquin passenger lines. Emissions by link were estimated based on latest available schedule for 2017 or 2018 (where available). For each link, emissions were estimated as the sum of emissions associated with exhaust from the locomotive, and idling emissions while loading passengers at stations.

To estimate the emissions, the number of locomotives per day that run along each link, as well as the activity along each line, are required. The activity along each Amtrak route is a function of the estimated average speed of the train and the frequency of the stops. To determine the number of stops, the District used the latest posted timetable and schedule by Amtrak.[41] The timetables provide the number of train stops at each station, and the times and frequency of the train stops. These were used to determine the following:

- The daily number of trains was calculated as the number of weekday and weekend trains weighted by 5/7 and 2/7, respectively.
- The idling times varied from 2 – 10 min at certain stations to accommodate timed connections to other public transportation; the average idling time at a station (to pick up and drop off passengers) was approximately 90 s at most stations. Trains can also spend up to 20 min idling to power on (power down) the engine at the beginning (end) of a run.

Based on the timetable, the number of daily trips along each route is presented in Table 2-28. The level of service and number of trains was assumed to remain constant.

[41] In most cases, the most recent timetable was posted in 2017 or 2018. Timetables were obtained from http://www.amtrak.com/train-schedules-timetables (accessed January 2019).

Table 2-28. Amtrak activity by route.

Routes	Destinations	Weekday trains per day	Weekend trains per day
Capital Corridor	Fairfield – Oakland	30	22
	Oakland – Coliseum	18	15
	Coliseum – San Jose	14	14
California Zephyr	Emeryville – Fairfield	2	2
Coastal Starlight	Gilroy – Fairfield	2	2
San Joaquin	Antioch – Oakland	5	0

Locomotives operate under a series of load modes (notches) that, combined with idling, determine the operating mode and the corresponding emission factors. The throttle notch is based on the load expected at each station, as well as the average speed. Emission factors and speeds that were used for each passenger line are presented in Table 2-29. The average speed was estimated using the distance traveled by the train on a route (or a portion thereof) divided by the elapsed travel time (based on the scheduled departure and arrival times) of the train between stations. An average throttle notch of three was used for the Capital Corridor because of the frequent stops, while for all remaining routes (which have fewer stops), a throttle notch of four was used.

Table 2-29. DPM emission factor (EF) and average speeds by Amtrak service/route.

Train service	Mode/ Throttle notch	EF (g/h)	Average speed (mph)
All passenger service	Idling	47.9	0.0
Capitol Corridor	3	210.9	35.0
California Zephyr	4	226.4	36.8
Coastal Starlight	4	226.4	40.0
San Joaquin	4	226.4	44.4

DPM emission factors were derived from the Port of Oakland 2005 Seaport Air Emissions Inventory (Environ International Corporation 2008), adjusted for fuel sulfur content of 15 ppm by weight in compliance with CARB's Marine and Locomotive Diesel Fuel regulation (adopted November 2004; California Environmental Protection Agency 2014). All passenger rail services were assumed to have a fleet mix based on GP4x and Dash 9 locomotives with respective certification levels being pre-controlled and achieving Tier 1 emissions.

Emissions were estimated for locomotives based on idling at stations or turnarounds and running exhaust between stations. Daily running exhaust emissions of DPM on each link were estimated as:

$$E_{DPM} = \frac{1}{s}(EF_{DPM} \cdot N \cdot L)$$

where

E_{DPM}	=	emissions of DPM per rail link per day (g)
s	=	average speed (mph) (Table 2-29)
EF_{DPM}	=	emission factor by rail link (g/h) (Table 2-29)
N	=	number of locomotives that travel on the rail link per day (unitless)
L	=	length of rail link (mi)

Running exhaust emissions were assumed to occur along each link except within 1,000 ft (0.189 mi) of a station. To be conservative, idling emission factors were used to estimate emissions within 500 ft before and after a station (equivalent to 1,000 ft). Idling emissions were used exclusively if the link was less than 0.189 miles and a station was situated on the link. Idling emissions were estimated by multiplying the emission factor by the number of stops on each link and the length of time of each stop, which varied by rail service and link:

$$E_{DPM} = EF_{DPM} \sum_{i} N_i \cdot T_i$$

where

E_{DPM}	=	emissions of DPM per rail link per day (g)
EF_{DPM}	=	emission factor for DPM by rail link (g/h) (Table 2-29)
N	=	number of locomotives that travel on the rail link i per day
T	=	idling time for each stop or turnaround on rail link i per day (h)

Even though activity levels varied per hour for each train route, the diurnal profile (fraction of total daily emissions that are produced per hour) for emissions from passenger rail were assumed to be evenly distributed throughout a 24 h period. The total emissions from passenger rail lines was 0.634 tpy of DPM and 0.596 tpy of $PM_{2.5}$ (assuming a size fraction of 0.94).

2.10 Railyards

There are three railyards in the West Oakland Source Domain. The Port has two railyards on its property: Oakland International Gateway railyard, which is leased by the BNSF railway, and Outer Harbor Intermodal Terminal, which is operated by the OGRE. BNSF is a Class I interstate railroad, while OGRE is a small regional Class III railroad serving portions of the former Oakland Army Base. The Union Pacific (UP) railyard is also located within the Port area, but it is privately owned and operated. It serves as an intermodal yard for freight movements through the Port as well as a yard for handling domestic non-Port freight.

2.10.1 BNSF

The BNSF railyard is a near-dock transfer point that handles Port cargo containers. Locomotives are used for line-haul operations (movement of long-haul trains into and out of California) and switching operations (switchers). Line-haul locomotives move into and out of the railyard and idle after arrival and prior to departure. Switching engines operate in the railyard, with idling periods interspersed throughout the day. Locomotives and trains enter the Port area from the north via the UP main line and leave in the same direction via tracks going north through Richmond, and then onto BNSF lines leading out of the Bay Area.

To characterize emissions from switchers, BNSF provided the Port with a sample of engines used in 2017. Switchers assigned to BNSF rotate in and out of service, but a GP25 or GP60 model were typically used (Table 2-30).

Table 2-30. Locomotive engine characteristics at the BNSF railyard.

Model	Certification Tier	hp	Number of Engines	Engine Surrogate
GP25	Precontrolled	2500	1	Average of GP-3x (2000 hp) and GP-4x (3000 hp)
GP60	Precontrolled	3600 – 3800	2	GP60 (3600 hp)

Locomotives and switchers operate using a series of load/power modes called "notches." The operating profile for a locomotive is defined by the notch settings and idling periods. Following CARB's guidance on rail yard emission modeling (California Air Resources Board 2006), emissions were estimated using emission rates per engine model and per mode, with average activity (time in mode) profiles for each visit multiplied by the number of engines visiting the railyard. The relative time per mode for switcher engine activity was taken from the 2006 Port of Oakland inventory (Environ International Corporation 2008; Table 2-31). Switching activity consists of one engine operating for 7.5 h per day (365 days per year); however, for consistency with the locomotive line-haul operations (see Section 2.9.1), the District assumed activity would occur over the entire day (24 h) for each day of the year.

Activities of line-haul engines include arriving with a train, separating from the train, potentially moving to the ready area where the engines are assigned to a train, moving to an assigned train, and leaving the yard. Twelve locomotive models and engine tiers were used at the BNSF yard for these operations. A sample of the line-haul engine activity was used to develop the average time in mode for line-haul locomotive arriving and departing from the yard. Because almost all line-haul locomotives have automatic idling-reduction devices (beginning with model year 2001), and idling is restricted to 15 min per event (per CARB agreement; California Air Resources Board 2005b), the idle time was adjusted to 1 h, assuming four in-yard movements per arrival and departure. The average time in mode for line-haul locomotives is summarized in Table 2-32.

Table 2-31. Percentage of time in mode of locomotives at the BNSF railyard.

Mode/ Throttle notch	Time (%)
Dynamic Braking	1.4
Idle	59.8
1	6.6
2	15.0
3	9.5
4	4.4
5	1.9
6	0.3
7	0.0
8	1.0

Table 2-32. Average time in mode of locomotives at the BNSF railyard. Idling time is based on assuming 0.5 h per arrival and departure.

Mode/ Throttle notch	Time (h)
Dynamic Braking	0.2963
Idle	1.0
1	0.1726
2	0.0758
3	0.0340
4	0.0049
5	0.0059
6	0.0004
7	0.0036
8	0.0017

Emission factors and fuel consumption by notch are consistent with previous Port inventories with adjustments to account for the idling-reduction devices and in-use fuel characteristics of no more than 15 ppm fuel sulfur content. Using California diesel fuel also reduces PM emissions by 7%; a factor of 0.93 was applied in the emissions estimates (Ramboll 2018). The combined emissions from line-haul and switcher activities at the BNSF railyard was 0.182 tpy of DPM and 0.168 tpy of $PM_{2.5}$ (as exhaust only).

2.10.2 OGRE

OGRE is a Class III, Surface Transportation Board-certified short line rail company created in 2014 that is currently operating at the former Oakland Army Base. In 2017, OGRE exclusively served non-marine facilities located on Army Base. Switching engine fleet characteristics and annual activity were provided by OGRE. Emission factors for locomotives at OGRE were estimated using locomotive engine surrogates of similar power (Table 2-33).

Table 2-33. Locomotive engine characteristics at the OGRE railyard.

Model	Certification Tier	hp	Number of Engines	Engine Surrogate
EMD GP9/16	Precontrolled	1500/1600	2	EMD 12-645E (1500 hp)
EMD MP15	Precontrolled	1500/1600	2	EMD 12-645E (1500 hp)

OGRE estimated the total switching engine activity to occur over 780 h (annually). The time in mode for the switchers at BNSF was used for the switchers at OGRE (Table 2-31); the total hours were distributed by notch, then the total emissions were obtained by summing the emissions by notch. The combined emissions at the OGRE railyard from line-haul and switcher activities was 0.077 tpy of DPM and 0.071 tpy of $PM_{2.5}$ (exhaust only).

2.10.3 UP

The UP Oakland Railyard is bounded by highway I-880, the Port, and residential, industrial, and commercial properties. The UP railyard is a cargo handling facility where intermodal containers arrive by truck to be loaded onto trains for transport, or arrive by train and unloaded onto chassis for transport by truck. Both cargo containers and chassis are temporarily stored at the yard. The railyard also has facilities for crane and yard hostler maintenance, locomotive service and repair, and on-site wastewater treatment.

Rail cars on arriving and departing line haul locomotives are moved using switchers. Switchers are used to move sections of inbound locomotives to appropriate areas within the railyard (e.g., intermodal rail cars go to the intermodal ramp for unloading and loading), and to move sections of outbound locomotives to tracks from which they will depart. Switchers are remote controlled in the UP railyard; while some are operated exclusively in the railyard, others are operated in the railyard at other outside facilities.

Emissions from the UP railyard were provided to the District by UP, and estimated using annual fuel consumption of eight switcher locomotives operating on the Niles Subdivision operating 8–12 h per day for every day of the year (365 days), as well as other equipment operating in the UP railyard (CHE, TRUs, and service/repair operations). The total emissions thus reflect the total activity at the UP railyard in 2017, estimated as 1.1098 tpy of DPM, and 1.0210 tpy of $PM_{2.5}$.

2.11 Commuter Ferries and Excursion Vessels

PM emissions from ferry and excursion vessel operations within the Source Domain were estimated based on information gathered from CARB, the San Francisco Bay Area Water Emergency Transportation Authority (WETA), ferry and excursion vessel schedules, and field studies.

WETA operates the San Francisco Ferry fleet, composed of 14 high speed passenger-only ferry vessels.[42] There are two commuter ferry terminals inside the West Oakland Source Domain: the Oakland Jack London Square ferry terminal (in Oakland), and the Alameda Main Street ferry terminal (in Alameda). A private excursion cruise operator, Commodore Cruises and Events, is also located within the domain.

2.11.1 Navigating

PM_{10} emissions were estimated using the methods for CHC engines (California Air Resources Board 2012b):

$$E_{PM_{10}} = EF_0 \cdot F \cdot \left[1 + D \cdot \frac{A}{UL}\right] \cdot LF \cdot HP \cdot T_O$$

where

$E_{PM_{10}}$	=	emissions of PM_{10} (g)
EF_0	=	zero-hour PM emission factor as a function of model year, horsepower, and engine use (propulsion or auxiliary) [g/(hp h)]
F	=	fuel correction factor (to account for emission reductions from burning cleaner fuel) (unitless)
D	=	engine deterioration factor (percentage increase of emissions when the engine is at the end of its useful life) as a function of horsepower (unitless)
A	=	current age of engine (y)
UL	=	engine useful life as a function of vessel type and engine use (y)
LF	=	engine load factor as a function of vessel type and engine use (unitless)
HP	=	engine horsepower rating (hp)
T_O	=	operating hours for activity (h)

Emission factors specific to the main propulsion and auxiliary engine by model year are required, in addition to a deterioration rate and a fuel correction factor. As vessel-specific data was not always available, state-wide and Bay Area average emission factors and parameters were used based on data from CARB and WETA (Table 2-34). Specifically:

- For commuter ferries, state-average emission factors, load factor, deterioration factor, number of engines per vessel, engine useful life, and fuel correction factors were taken from California Air Resources Board (2012b).
- Ferry-specific engine counts, engine age, engine horsepower, and load factor on commuter ferries used at the two ferry terminals were provided by WETA.[43]
- For excursion vessels, Bay Area-specific data for excursion vessels for main and auxiliary engines were obtained from CARB based on their 2017 Statewide CHC survey (personal communication, August, 2018).

[42] Not all vessels operate at the same time. The WETA San Francisco Bay Fleet information can be found at https://sanfranciscobayferry.com/sites/default/files/SFBFfleet.pdf (accessed December 2018).

[43] Obtained from K. Stahnke, San Francisco Water Emergency Transportation Authority, personal communication, September, 2018.

Table 2-34. Commuter ferry and excursion vessel operating parameters. Values obtained from CARB (2012b and personal communication, August, 2018), except number of vessels (n), vessel age (A), horsepower (HP), and load factor (LF) obtained from WETA. EF, F, and D are specific to PM_{10} (DPM). Values reported for excursion vessels are averages over the operating fleet.

Vessel type	Engine	n	EF [g/(hp h)]	F	D	A (y)	UL (y)	LF	HP (hp)
Ferry	Main	2	0.10	0.80	0.67	3	20	0.38	1950
	Auxiliary	1	0.09	0.80	0.44	3	20	0.38	162
Excursion	Main	2.01	0.15	0.50	0.75	0.67	20	0.42	1473
	Auxiliary	1.23	0.22	0.71	0.75	0.44	20	0.43	116

To obtain in-transit operating activity, information from ferry schedules were reviewed for each ferry route. Based on departure and arrival times, the duration of travel time was estimated for the Oakland–Alameda route and for runs directly from ferry terminals to the extents of the Source Domain. Operating activity for excursion vessels was taken from the CARB 2017 Statewide CHC survey. In-transit emissions estimates for each route are presented in Table 2-35, where DPM emissions were assumed to equal PM_{10} emissions, and $PM_{2.5}$ emissions were obtained by multiplying the DPM emissions by a size fraction factor of 0.97 (consistent with similar vessels in the 2017 Port Inventory).

Table 2-35. $PM_{2.5}$ and DPM emissions from commuter ferry and excursion vessel in-transit activity.

Vessel type	Route	$PM_{2.5}$ (tpy)	DPM (tpy)
Ferry	Oakland – Alameda	0.0738	0.0761
	Oakland – San Francisco	0.2781	0.2867
	Oakland – South San Francisco	0.0884	0.0911
	Alameda – San Francisco	0.2940	0.3031
	Alameda – South San Francisco	0.0619	0.0638
Excursion	Commodore Events and Cruises (to San Francisco)	0.0392	0.0404

2.11.2 Berthing

As aforementioned, there are two commuter ferry terminals inside the West Oakland Source Domain (one in Oakland, and the other in Alameda), and a berth associated with a privately-operated excursion vessel company (Commodore Cruises and Events).

To estimate the $PM_{2.5}$ emissions from berthing, the number of trip visits at each terminal was determined based on ferry schedules. For excursion vessels, since there was no daily schedule and operating hours vary by event, berthing activity was based on operator data taken from the CARB 2017 Statewide CHC survey. Commuter ferry berthing time was based on a sample of observations taken by District staff in 2018 at the two ferry terminals, where the average berthing time to load and unload commuters at a terminal was approximately 10 min. Both the main and auxiliary engines were observed to run the entire time during this berthing process. Emissions were calculated as described above Section 2.11.1 and are summarized in Table 2-36.

Table 2-36. $PM_{2.5}$ and DPM emissions from commuter ferry and excursion vessel berthing.

Vessel type	Berth	$PM_{2.5}$ (tpy)	DPM (tpy)
Ferry	Oakland (Jack London Square terminal)	0.0058	0.0060
	Alameda (Main Street terminal)	0.0061	0.0063
Excursion	Commodore Cruise and Events terminal	0.1552	0.0600

3. Air Dispersion Modeling

The dispersion model applied in the technical assessment for West Oakland was the American Meteorological Society/EPA Regulatory Model Improvement Committee Regulatory Mode (AERMOD). AERMOD was used to perform dispersion modeling using unit emission rates to represent the emissions from a variety of sources (Section 2): permitted stationary sources, on-road mobile sources, truck-related businesses, OGVs, CHCs, CHE, Port Trucks at Port terminals, locomotives, railyard activity, commuter ferries and excursion vessels, and ferry berths. Meteorological data (Section 3.2) are used to simulate dispersion using AERMOD (Section 3.3), where the emissions from sources with specific temporal and spatial allocations (Section 3.4) are dispersed, and concentrations are sampled downwind at receptors (Section 3.5). Source contributions at each receptor can then be summed to evaluate total $PM_{2.5}$ concentrations and cancer risk (Section 4).

3.1 Modeling Approach

The AERMOD modeling system is comprised of three modules: (1) AERMET, a preprocessor for making compatible meteorological data sets, (2) AERMAP, a processor for digital terrain data, and (3) AERMOD, an air dispersion model. Data generated from AERMET and AERMAP are used by AERMOD to estimate downwind concentrations. AERMOD (Cimorelli *et al.* 2004) is a steady-state Gaussian-based plume dispersion model based on planetary boundary layer turbulence structure and scaling concepts. AERMOD can model dispersion from both surface and elevated sources, in simple and complex terrain, and in rural and urban areas.

In AERMOD, emissions are dispersed from a *source*, and concentrations are sampled at a *receptor*. A source is defined by entering its location, physical characteristics (e.g., width, height), and emissions characteristics (i.e., emission rate, and changes of that rate over time). In AERMOD, a source can be defined by using different source types: point, area, and volume sources. Different sources types are better suited for representing different types of emission sources; for example, point sources are typically used to model dispersion from single facility stacks. A receptor is a location where air pollutant concentrations are estimated by the model. Receptors could correspond to the locations of monitoring sites or specific locations of interest (e.g., sensitive receptors). Many receptors must be placed within a modeling domain to adequately sample the spatial extent and gradients of pollutants near emission sources.

Because of its ability to handle multiple source types, the AERMOD modeling system was used to model dispersion from all sources in West Oakland. The AERMOD FORTRAN source code (version 18081, dated March 22, 2018) was downloaded from the U.S. EPA Support Center for Regulatory Air Models (SCRAM) web site.[44] The source code was compiled on the District's Linux clusters using the Portland Group, Inc., FORTRAN 90/95 compiler (pgf95 v8.0-6 64 bit). AERMET (version 18081) and AERMAP (version 18081) were installed on the District's Microsoft Windows computers via AERMOD View (provided by Lakes Environmental).

[44] http://www.epa.gov/scram001/dispersion_prefrec.htm.

Modeling a large number of sources requires a large amount of computing time, especially when there are many receptors (see Section 3.5). To reduce the wall time required to complete the analysis, model runs by individual source were distributed across a large number of computer processors.[45] And, as the dispersion from each source was modeled separately, individual source contributions could be tracked and assessed.

Dispersion modeling requires many input parameters to characterize emission sources, including an emission rate, which may vary over the modeling period (e.g., by hour of day, by day of week, etc.). For a single source, emission rates also vary by pollutant; ordinarily, in a multi-pollutant analysis, the number of model runs required is equal to the number of pollutants. However, the number of model runs can be reduced by using a *unit emission rate*[46] (1 g/s for point and volume sources, 1 g/(s m^2) for area sources) for each source. Temporal changes in the unit emission rate are scaled using the emissions or activity profile (e.g., hours of operation) of the source. AERMOD output are then *dispersion factors* with units of concentration per unit emissions ([$\mu g/m^3$]/[g/s] for point and volume sources, or [$\mu g/m^3$]/[g/(s m^2)] for area sources) at each receptor. Following this approach, average concentrations can be calculated by multiplying the dispersion factor by an average emission rate in a post-processing step (see Section 4.1.2). Using this method holds so long as (a) the emission rates for different pollutants are related to the same changes in source activity, and (b) the dispersion factor and emission rate are averaged over the same time scales.[47] This method does not account for any chemical transformations.

3.2 Meteorological Data

3.2.1 Surface meteorology

The District operates a meteorological monitoring network of stations within the nine Bay Area counties that provide measurements of ambient meteorological parameters to support many air quality-related programs. Several of these stations are near West Oakland. The Oakland Sewage Treatment Plant (OST) station is operating in the current network (Figure 3-1). The National Oceanic and Atmospheric Administration (NOAA) operates a network of buoy and land-based weather stations in the Bay as part of the National Ocean Service's Center for Operational Oceanographic Products and Services (CO-OPS) network that monitors atmospheric and ocean/bay surface conditions. Three land-based stations (Oakland Berth 34 [OKXC1], Oakland Middle Harbor Met [OMHC1], and Oakland Berth 67 [LNDC1]) are also located near West Oakland (Figure 3-1). All these stations measure wind speed, wind direction and temperature, which are required parameters for the AERMOD model. The OST data are reported as hourly averaged, while the CO-OPS data are two-minute averages reported every six minutes.

---

[45] Two computer platforms were used: (1) a 14 node Linux cluster, each with eight Intel® Xeon® E5335 2 GHz processors; and (2) a 12 node Linux cluster, each with 20 Xeon E5-2640 Broadwell 2.4 GHz processors. Processors were used as they became available to complete modeling runs using a job queuing system.

[46] Using unit emissions is sometimes referred to as the χ/Q ("chi over q") method. The origin of this reference stems from the conventional use of χ to represent average concentration, and Q to represent an emission rate.

[47] For example, in this analysis, for on-road mobile sources, dispersion factors and emission rates were developed separately by day of week (weekend and weekday), and then summed to obtain an annual average concentration. All other sources were modeled as annual averages.

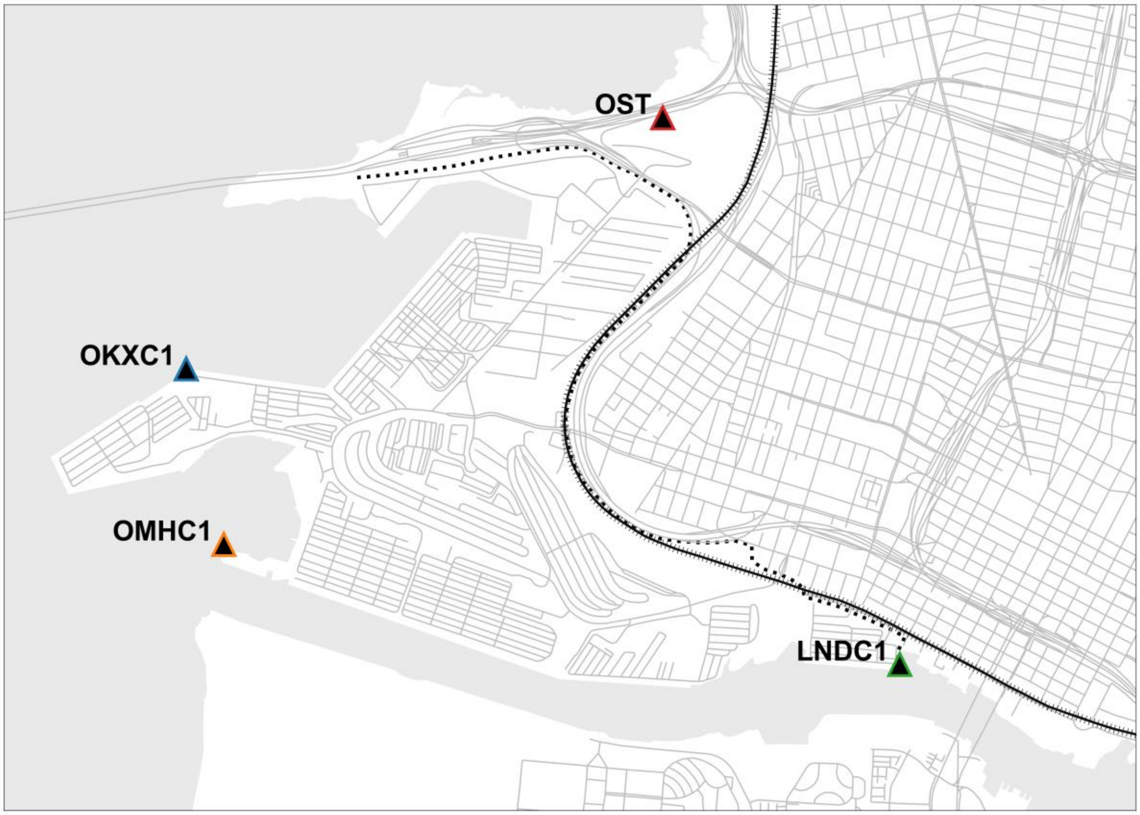


Figure 3-1. Surface meteorological monitoring stations considered for this analysis: OST (Oakland Sewage Treatment Plant), Oakland Berth 34 (OKXC1), Oakland Middle Harbor Met (OMHC1), and Oakland Berth 67 (LNDC1).

Of the four meteorological stations, only OST was sited to meet EPA modeling guidelines. The CO-OPS station sitings were meant to aid in the docking of container ships and in navigating the Oakland inner harbor. The wind vanes on all three CO-OPS stations are well below the recommended 10 m installation height (7.6 m at OKXC1 and LNDC1, and 6.7 m at OMHC1). OKXC1 and OMHC1 are also located at the land/water interface, with open water to the west, which is the dominant wind direction in West Oakland. The smooth upwind water surface could lead to lower mechanical mixing (lower dispersion) when modeled in AERMOD. LNDC1 is also sited in a location that is not ideal to support AERMOD modeling, as the surrounding surface roughness can vary depending on the placement of shipping containers and the movement of the shipping cranes, which can in turn affect measurements at the site. OST wind sensors were installed higher (16.3 m) than the minimum recommended height (10 m) to compensate for the heights of nearby structures. For these reasons, OST meteorological data was selected for the West Oakland AERMOD modeling.

OST data for year 2014 were selected for the AERMOD modeling as subsequent years had significant periods of missing data. In 2014, winds were most frequent from the west and west-northwest at speeds of 2.0–6.0 m/s (4.5–13.4 mph) (Figure 3-2). The OST data were processed through AERMET to create meteorological inputs used in subsequent dispersion modeling using AERMOD.

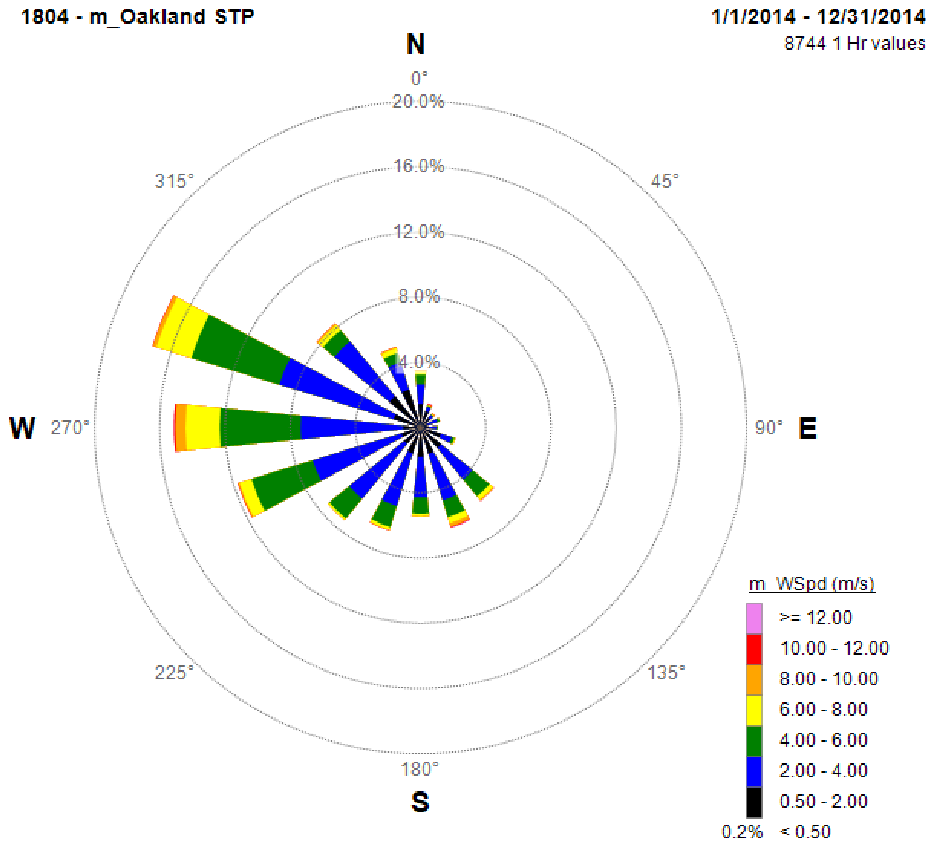


Figure 3-2. Annual windrose at the Oakland Sewage Treatment Plant (OST) in 2014. Compass sectors indicate the direction from which the wind is blowing. The percentage of calm winds (WSpd < 0.5 m/s) are also indicated.

3.2.2 Upper-air meteorology

The twice-daily (4:00 AM LST and 4:00 PM LST) upper air sounding data from the Oakland International Airport (KOAK; +37.744408° N, –122.223510° W) were also processed through AERMET to create input data for AERMOD dispersion modeling. The KOAK sounding is the only National Weather Service (NWS) upper air station in Northern California. Data from these soundings are namely used to calculate the convective mixing height during daylight hours.

3.3 AERMOD Model Configuration

Dispersion factors were modeled using default regulatory model options, including: stack-tip downwash, accounting for elevated terrain, calms processing routine,[48] missing data processing routine,[49] and an urban roughness length of 1.0 m. Additionally, no dry or wet deposition was included. Building downwash effects were not incorporated since individual building heights were not generally available. All sources were classified as urban sources, which is representative of land cover in West Oakland. The urban population (used as a surrogate to define the magnitude of the nighttime urban heat island, which enhances dispersion in the stable boundary layer) used was 650,000.[50] The height of each receptor was set to 1.8 m agl (referred to as "flagpole receptors"), which represents the breathing height of an average adult.

Dispersion factors were output as a daily average over the entire modeling period. Modeling was based on a meteorological dataset from 2014 (see Section 3.2). For on-road mobile sources, two modeling periods were used: all weekdays (261 days), and all weekend days (104 days). Otherwise, the period was defined as the entire year (January 1, 2014, through December 31, 2014).

The geographic coordinate system used throughout the modeling was a Universal Transverse Mercator (UTM) projection for zone 10 North with the North American Datum of 1983 (NAD83). Unless otherwise stated, for simplicity, the base elevation of each source was assigned by taking the elevation of the closest receptor as generated using AERMAP (see Section 3.5).

All sources in this analysis were located within the Source Domain, which encompassed the entire West Oakland community and Port of Oakland, and includes all emission sources discussed in Section 2 (Figure 2-2). A smaller "Receptor Domain" (Figure 3-3), embedded within the Source Domain, was used to define the extents of where receptors should be placed in AERMOD (see Section 3.5). The location of receptors is more spatially constrained so that they are located in areas where the population could be exposed (i.e., receptors were not placed over the Oakland harbor).

---

[48] In the calms processing routine, the concentration for a given hour is set to zero if the wind speed of that hour is calm. The (zero) concentration is then excluded when longer term (period) average concentrations are calculated (U.S. Environmental Protection Agency 2018b).

[49] In the missing data processing routine, hours with missing meteorological data are treated the same way as in the calms processing routine (U.S. Environmental Protection Agency 2018b).

[50] This is the total population of Berkeley, Piedmont, Emeryville, Oakland, and Alameda, based on the U.S. Census Bureau July 1 2017 (V2017) dataset (available via https://www.census.gov/quickfacts). The total population from these areas was rounded to the nearest thousand (U.S. Environmental Protection Agency 2015a). A slight over- or under-estimate of the population will not adversely affect modeling results since the urban algorithms in AERMOD depend on the population to the one-fourth power (Cimorelli *et al.* 2004).

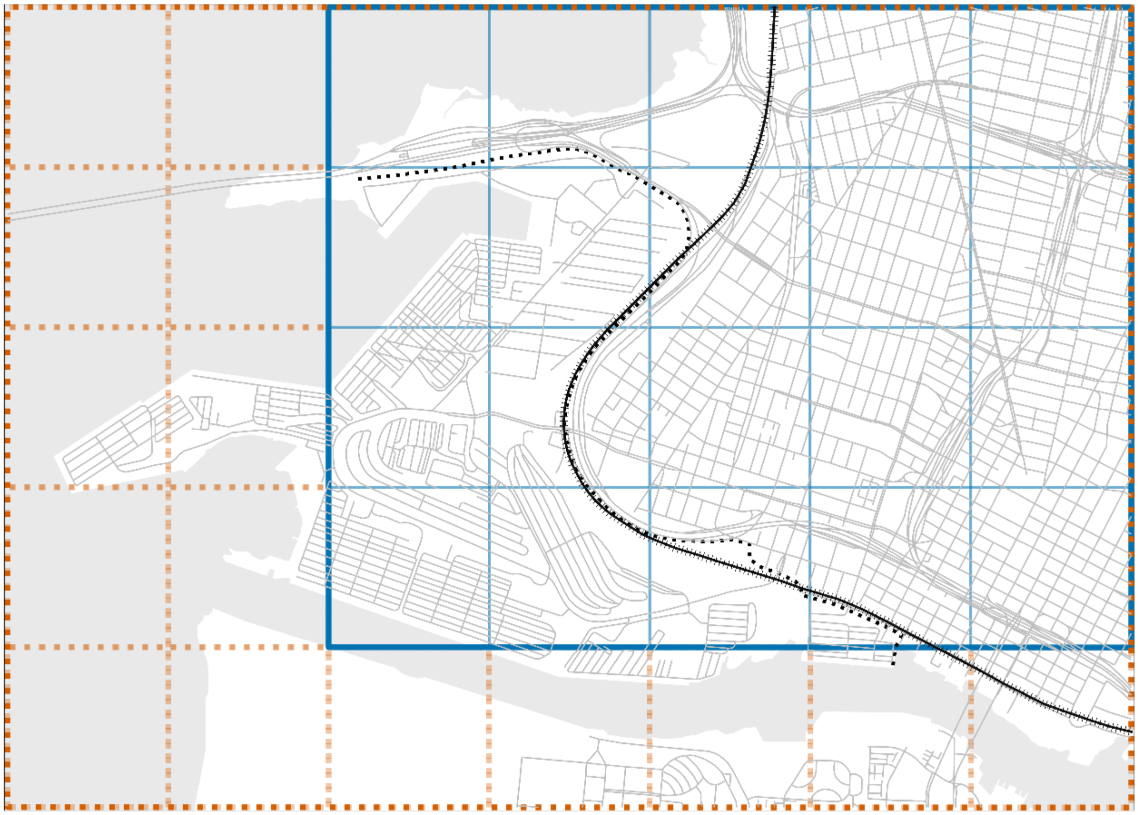


Figure 3-3. Extents of the Source Domain (red dotted lines) and Receptor Domain (blue solid lines) used in AERMOD modeling. The inner tiles represent the 1 km × 1 km grid cells of the regional modeling.

3.4 Sources

3.4.1 Overview

Source-specific modeling parameters used for the emission sources in West Oakland (Section 2) are described in this section. In AERMOD, the user (modeler) must identify how each emissions source will be modeled (i.e., as a point, area, or volume), and input the location and associated modeling parameters. Location information includes the *x* coordinate (longitude), *y* coordinate (latitude), and *z* coordinate or base elevation (m asl). For point and volume sources, the *x* and *y* coordinates correspond to the center of the source. Multiple *x* and *y* coordinates are required for area sources when represented as polygons. In general, the parameters required by source type are:

- **Point**: emission rate (g/s), stack height (m agl), stack gas exit temperature (K), stack gas exit velocity (m/s), and interior stack diameter (m).
- **Area**: emission rate [g/(s m^2)], release height ($Relhgt$, m agl), and initial vertical dispersion coefficient ($Szinit$, m).
- **Volume**: emission rate (g/s), release height (center of volume) ($Relhgt$, m agl), initial lateral dispersion coefficient ($Syinit$, m), and initial vertical dispersion coefficient ($Szinit$, m).

These modeling parameters are important for determining plume rise and how emissions are transported downwind of the source. As aforementioned, the emission rate for all source types was set to a unit emission rate. An optional modeling parameter to vary the emission rate was applied to sources when the diurnal activity profile was available.

The type of source used to model emission sources in West Oakland depended on the source category (Table 3-1). The general process used to determine the location (*x* and *y* coordinates) of sources for each source type in described below, while specific parameters by category are summarized in the sections that follow.

Table 3-1. AERMOD source types used by source category for emissions sources in West Oakland. Point sources include point, capped, and horizontal emission releases. Ferry berths include berthing locations for commuter ferries and excursion vessels.

		AERMOD Source Type			
				Volume	
Section	**Source Category**	**Point**	**Area**	**Single**	**Adjacent**
3.4.2	Permitted stationary sources	×		×	
3.4.3	On-road mobile sources				×
3.4.4	Truck-related businesses		×		
3.4.5	OGVs (transiting, maneuvering, berthing)		×		
3.4.6	CHCs		×		
3.4.7	CHE		×		
3.4.8	Port Trucks at terminals (transiting, idling)		×		
3.4.9	Locomotives				×
3.4.10	Railyards		×		
3.4.11	Commuter ferries and excursion vessels – navigating				×
3.4.11	Commuter ferries and excursion vessels – berthing		×		

(a) Point Source and Single Volume Source Locations

The only point and single volume sources in this analysis were permitted stationary sources. The District maintains a database of these sources and their locations, from which the location of each stack was obtained after QA (Section 2.2).

(b) Area Source Locations

Area sources were manually traced using Google Earth. The polygons were then saved as a shapefile, and an automated program was used to extract the *x* and *y* coordinate values of the vertices and create AERMOD-ready input files.

(c) Adjacent Volume Source Locations

In this analysis, mobile sources were modeled following much of EPA's current guidance for PM hot-spot analyses for transportation projects (U.S. Environmental Protection Agency 2015b, 2015c).[51] On-road mobile sources were modeled using adjacent volume sources. Both adjacent area and volume sources can be used to represent emissions from on-road mobile sources in AERMOD, though adjacent area sources are usually favored since they "may be easier to characterize correctly compared to [adjacent] volume sources" (U.S. Environmental Protection Agency 2015b, p. 105). This is because adjacent volume sources must be placed so that the volume centroids are equidistant from each other along the length of the emissions source (e.g., roadway), resulting in up to thousands of individual volume sources to characterize a single emissions source. Common errors made when configuring adjacent volume sources include incorrect volume centroid spacing (so that volumes are no longer adjacent), and using an inappropriate source width (e.g., street width) (Desser 2014). Typically, the initial lateral dispersion coefficient, $Syinit$, is calculated as the source width divided by 2.15. For volume sources, the exclusion zone (EZ) is an area around each volume source where AERMOD does not calculate results,[52] and no receptors should be placed. The radius of the EZ (r_{EZ}) from the centroid of the volume is calculated as:

$$r_{EZ} = (2.15\ \cdot Syinit) + 1.0$$

As receptors are to be placed as close at 5.0 m to roadways to adequately sample spatial concentration gradients, the maximum width of a roadway in AERMOD should be 8.0 m (U.S. Environmental Protection Agency 2015c); roadways that exceed this width should be modeled as several series of adjacent volume sources, such as to represent different travel lanes.

Because of the complexity of configuring adjacent volume sources, commercial software can help simplify this task by using a graphical user interface. Though, the process remains arduous if many emissions sources need to be included, such as in this analysis, where all roadways in West Oakland were modeled. For this reason, the District created an internal software package designed to automate the process of configuring adjacent volume sources for all emissions sources that are linear in nature – on-road mobile sources, locomotives on rail lines, and commuter ferries and excursion vessels.

In this process, the required inputs are a shapefile containing a network of line geometries representing the centerline of the emissions sources (roadway, ferry track, rail line), with a source width assigned to each segment (for roadways, the number of lanes can also be supplied). As a first pass, the number of volumes per line segment is determined by dividing the total length of the segment by its width, and each volume centroid is placed a distance of a width apart.[53] For roadways, if the total width exceeds a maximum width threshold (8.0 m), then the number of lanes is used to create a new series of roadway (lane) 'centerlines' parallel to the input centerline, and

---

[51] That being said, as this analysis is not a formal PM hot-spot analysis, some aspects to the modeling approach differed.

[52] Suppose there is a receptor A within the EZ of volume source a; AERMOD will not calculate results (output is 0.0) at A. However, if the model is configured with multiple volume sources – a, b, c – and receptor A is only within the EZ of volume source a, then the results at receptor A only represents the contributions from volume sources b and c, which is an underestimate of the expected results.

[53] Only a whole number (integer) of volumes can be placed along segment. The first volume centroid is located at a position whose distance is half the width of the source from the starting coordinate of the segment.

the new width is equal to the total width divided by the number of lanes. Multiple iterations are performed to minimize the number of overlapping volume sources at network nodes, as the overlaps can cause spurious small-scale “hot spots” of emissions.

3.4.2 Permitted Stationary Sources

Depending on the specific source category, emissions from permitted stationary sources were modeled as either point or volume sources in AERMOD. Modeling parameters were based on the most recent data available. All point and volume centroid locations were based on the coordinates available in the 2017 CEIDARS report (see Figure 2-4). The District also promulgates the release parameters as part of the CEIDARS report (by individual source at each facility). However, more recent release parameters may be provided by facilities in permit applications (in health risk assessments [HRAs] or in prevention of significant deterioration [PSD] analyses) is conducted as part of a permit application and are therefore not available through CEIDARS. The District therefore collected permit applications (available up to November 2018) and manually updated the 2017 CEIDARS modeling parameters for each source in West Oakland. Increasing the accuracy of the release parameters should result in higher confidence in dispersion model performance and therefore higher confidence in the estimated downwind concentrations.

(a) GDFs

Emissions from GDFs were modeled as volume sources in AERMOD, where the initial release parameters were determined by the number of gasoline dispensers at the facility. When the number of dispensers at the facility was known, $Syinit$ was estimated using the equation:

$$Syinit = -0.00393\ \mathrm{m} \cdot n^2 + 0.3292\ \mathrm{m} \cdot n + 0.7285\ \mathrm{m}$$

where n is the number of gasoline dispensers (based on Sonoma Technology Inc. 2011). $Relhgt$ was always set to 1.03 m (see Table 3-2 for a summary of these parameters).

(b) All other permitted stationary sources

Emissions from permitted stationary sources were modeled as point sources when stack release parameters or default parameters were available. Otherwise, the emissions were modeled as volume sources. Default parameters (used when information was not available) for point and volume sources are listed in Table 3-2.

Table 3-2. Default modeling parameters for permitted stationary sources. These values were applied when no other modeling information was available. The source type indicates the type of source in AERMOD that was used for dispersion modeling. The following variables are used: $Relhgt$ (release height), $Syinit$ (initial lateral dispersion coefficient), $Szinit$ (initial vertical dispersion coefficient). For gasoline dispensing facilities, n is the number of dispensers at the facility.

Source Description	Source Type	Default	
		Parameter	**Value**
Prime or Standby Generator	Point	Stack height	3.66 m (12 ft)
		Stack diameter	1.83 m (0.6 ft)
		Exit temperature	739.8 °C (872 °F)
		Exit velocity	45.3 m/sec (8,923 ft/min)
Sources that have incomplete modeling information	Point	Stack height	6.1 m (20 ft)
		Stack diameter	3.05 m (1 ft)
		Exit temperature	644 °C (700 °F)
		Exit velocity	17.8 m/s (3,500 ft/min)
No information available	Volume	$Relhgt$	1.8 m
		$Syinit$	10 m
		$Szinit$	1.0 m
Gasoline Dispensing Facility (Gas Station)	Volume	n	4
		$Relhgt$	1.03 m (3.4 ft)
		$Syinit$	1.98 m if n = 4; otherwise use equation in Section 3.4.2

3.4.3 On-Road Mobile Sources

The approach for modeling emissions from on-road mobile sources depended on location: those from roadways within terminals at the Port, and those within the rest of the Port area and West Oakland community. This section presents the modeling approach for the latter group; emissions from on-road mobile sources on roadways within terminals are discussed in Section 3.4.7.

On-road mobile source emissions were modeled in AERMOD as adjacent volume sources. The location of the volumes (centroids) was developed using a roadway network obtained from Citilabs, and the elevation (expressed as an adjusted release height) was determined from a lidar dataset. Other emissions characteristics were based on current EPA PM hot-spot guidance.

(a) Location (x, y, and z coordinates)

A shapefile containing the geographic location of roadways and roadway attributes in Alameda County was obtained from Citilabs (Streetlytics platform) to develop the locations and extents (widths) of adjacent volume sources. A description of this data set and the filtering and QA process applied by the District is described in Section 2.3. While the accuracy of volume source locations is dependent on the accuracy of the roadway network obtained from Citilabs, the District did not directly QA the roadway segment centerline locations.

While roadway (source) width is not a readily available parameter, it is needed to determine $Syinit$ of each volume; a combination of the roadway functional class and the number of lanes was used to approximate the roadway width, where the total width was taken as the number of lanes times the width per lane. The width per lane was based on guidance for roadways in urban areas as classified by FHWA (Table 2-8): 3.6 m for freeways, 3.0 m for arterials, and 2.7 m for local roads (American Association of State Highway and Transportation Officials 2018).[54]

Adjacent volume source locations were generated using the algorithm described in Section 3.4.1(c) (Figure 3-4). Volume source locations were identical for Non-Trucks and Trucks. Once the *x* and *y* coordinates of each volume source were determined, the *z* coordinate (base elevation) was taken from the nearest receptor (Section 3.5).

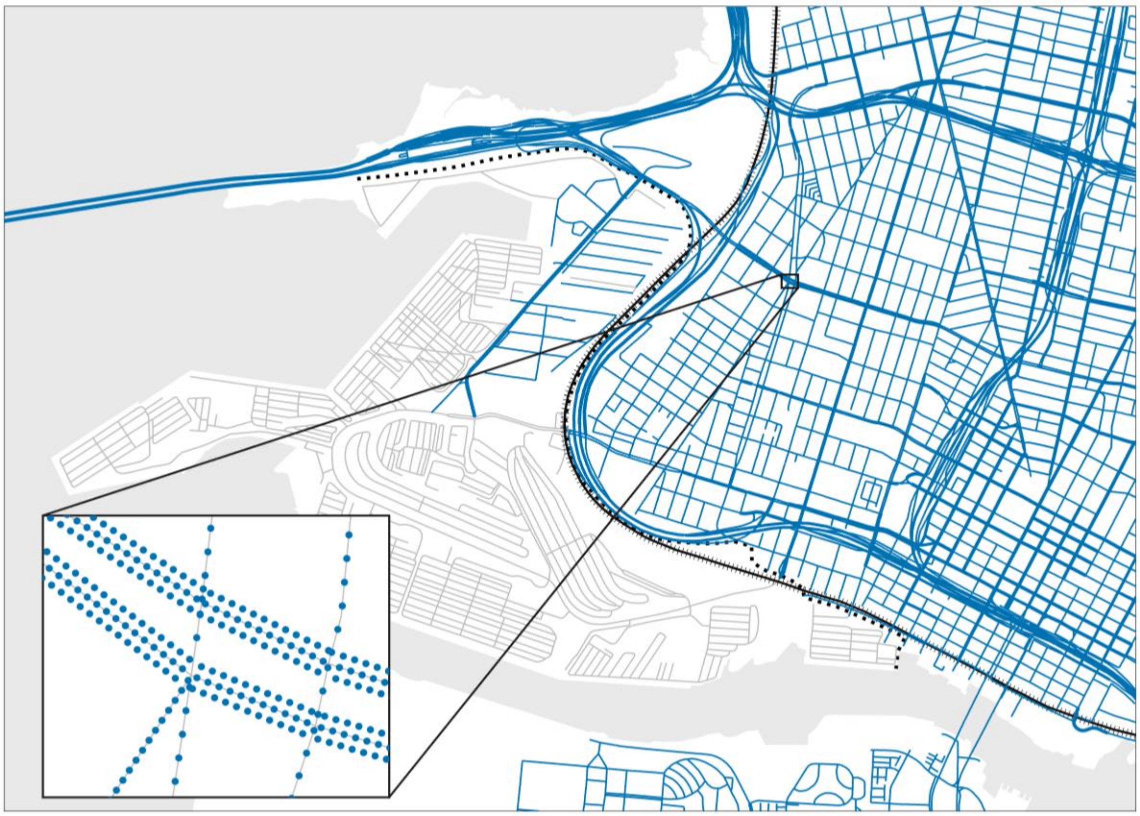


Figure 3-4. Locations of adjacent volume sources used to model emissions from on-road mobile sources. In the inset, the grey lines represent the location of roadways centerlines. The location of the marker represents the centroid of the volume source; the size of the marker does not reflect the dimensions of the volume source.

(b) Elevation (Adjusted release height)

In West Oakland, there are many roadways segments that are elevated, i.e., where the road surface is above grade, such as freeway overpasses. In this analysis, the elevated roadway structure heights were added to the emissions release heights (see (c)) to obtain an adjusted release height. The

[54] Based on the Citilabs network, on- and off-ramps were assigned to both arterial and local road categories.

roadway surface heights were developed from two lidar raster datasets obtained from the U.S. Geological Survey (USGS), downloaded via the National Oceanic and Atmospheric Administration (NOAA) Data Access Viewer:[55] *2010 USGS San Francisco Coastal Lidar* (at 1 m resolution), and *2006 USGS Topographic Lidar: Alameda County* (at 2 m resolution). Both datasets were available in UTM zone 10 North projection (NAD83). The latter (older) dataset was needed to increase the spatial coverage of elevation information, so that elevation data would be available for the entire West Oakland Source Domain. Roadway surface structure heights were developed as follows:

(1) The ground elevation (Z_{Ground}, m asl) and Unclassified (Class 1) elevation ($Z_{Unclassified}$, m asl) data channels were obtained. Unclassified includes the elevation of vegetation, buildings, and other structures (such as roadways). For each channel:
   a. The 2006 dataset was resampled to the resolution of the 2010 dataset.
   b. The 2010 dataset was filled with the 2006 dataset where there was missing data within the Source Domain.
   c. Remaining missing pixel values were filled using an inverse distance weighted (IDW) interpolation.

(2) The resulting absolute structure height, Z_s, was calculated as:

$$Z_s = Z_{Unclassified} - Z_{Ground}$$

To reduce some noise in the data, all values ≤ 1.8 m were coerced to 0.0 m.

(3) The average absolute structure height, $\overline{Z_s}$, was added to the release height of each volume source. Given the area of the volume defined as a circle from the volume centroid (*x*, *y*) with a radius of $Syinit$ (which may vary by roadway link):
   a. For non-overlapping volumes, $\overline{Z_s}$ was taken as the average of all pixel values within the circular area.
   b. For overlapping volumes, which can occur at roadway intersections or for roadways overpasses, the release height was calculated by linear interpolation of $\overline{Z_s}$ values from adjacent volumes along the same roadway link.

Given the input datasets and algorithm, this process may not always determine the correct roadway heights due to channel noise, confounding data (e.g., vegetation overhanging roadways, which results in a higher interpreted structure height), or because of nearly-parallel overlapping roadways resulting in a significant number of overlapping volumes (e.g., an overpass over another street). Some freeway segments[56] (n = 12) with incorrect $\overline{Z_s}$ assignments were manually identified and corrected using an IDW interpolation between the known $\overline{Z_s}$ values start and end of the segment. The resulting values of $\overline{Z_s}$ at each volume centroid are shown in Figure 3-5; these results could be further improved with additional QA and filtering techniques (see Section 6.2.2).

[55] https://coast.noaa.gov/dataviewer/.

[56] Freeway segments were prioritized since they will have the highest AADT and therefore highest emissions.

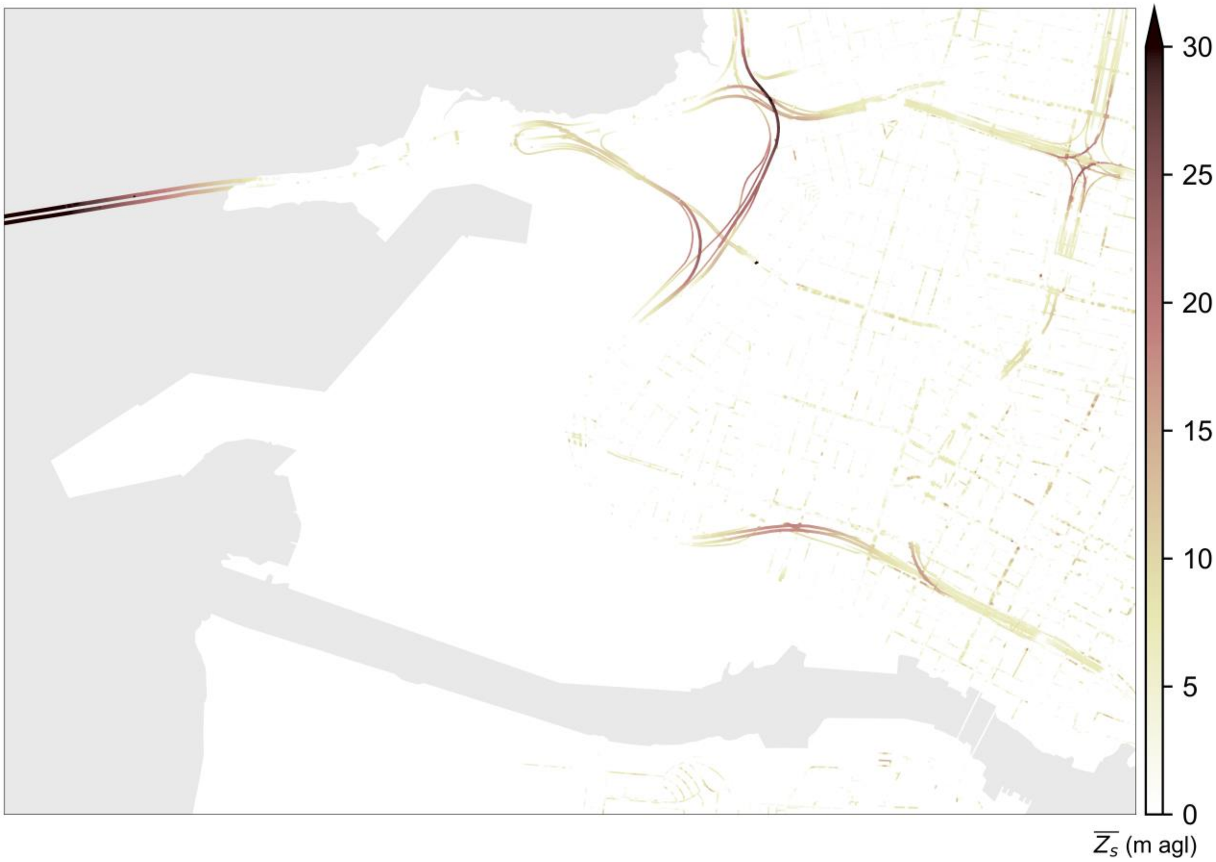


Figure 3-5. Average absolute structure heights of roadways at volume source centroids derived from lidar datasets. A $\overline{Z_s}$ value of 0 m agl indicates (white, not visible) that the volume source is at ground level and the roadway is at grade.

(c) Emissions characteristics

Though the location of volume sources by vehicle categories (Non-Trucks and Trucks), were identical,[57] they were modeled separately to track individual contributions to concentrations at receptors. While dispersion release parameters differ between Non-Trucks and Trucks, diurnal emission (activity) profiles also differ by day of week. This resulted in a four AERMOD dispersion modeling runs for on-road mobile sources for a given roadway segment: (a) Non-Trucks on WD, (b) Non-Trucks on WE, (c) Trucks on WD, and (d) Trucks on WE. For roadways located in the Port but that were not within active terminals, only Truck-configured runs were performed but used to characterize the emissions from all vehicle types.[58]

For all adjacent volume sources, the initial horizontal and vertical dispersion coefficients were based on the AERMOD User's Guide for surface-based sources (U.S. Environmental Protection Agency 2018b):

[57] As suggested by EPA, "overlapping versions" of each roadway segment can be used to represent the total emissions, treated each version with appropriate parameters to represent different vehicle categories (U.S. Environmental Protection Agency 2015c).

[58] This was done for convenience, but also because it is assumed that there is a low percentage of Non-Trucks on roads within the Port.

$$Syinit = W / 2.15$$

$$\begin{aligned} Szinit &= PH / 2.15 \\ &= (H \cdot \gamma) / 2.15 \end{aligned}$$

where W is the source width, PH is the initial vertical dimension of the source plume (plume height), H is the average source (vehicle) height, γ is a parameter to account for the effects of vehicle-induced turbulence, which equals 1 when vehicles are not moving, or 1.7 when vehicles are in motion (U.S. Environmental Protection Agency 2015c). H depends on the vehicle category, and was taken as 1.53 m for Non-Trucks, 4.0 m for Trucks. Therefore, $Szinit$ was set to 1.2098 m for Non-Trucks and 3.1628 m for Trucks.

Finally, the release height was estimated as the midpoint of the initial vertical dimension, i.e., $Relhgt = 0.5 \cdot PH$. Therefore, $Relhgt$ was initially set to 1.3 m for Non-Trucks, and 3.4 m for Trucks. For volumes that were not at-grade, $Relhgt$ was then adjusted by $\overline{Z_s}$ to obtain an adjusted release height.

To facilitate a unit emissions modeling approach, diurnal emission profiles for each roadway segment by vehicle category and day type were developed based on activity data (as described in Section 2.3). The diurnal activity profiles are comprised of ratios derived from hourly traffic volume normalized by the average daily traffic volume. These values are then used to scale the unit emission rate during the AERMOD run so that the hourly unit emission rate reflect the actual emission rates. For roadway segments located in the West Oakland community, diurnal profiles were link-specific for Non-Trucks, and road type-specific for Trucks (Figure 3-6). For roadway segments in the Port, diurnal profiles for Non-Trucks and Trucks were identical (since only one set of runs was performed, as noted above; Figure 3-7).

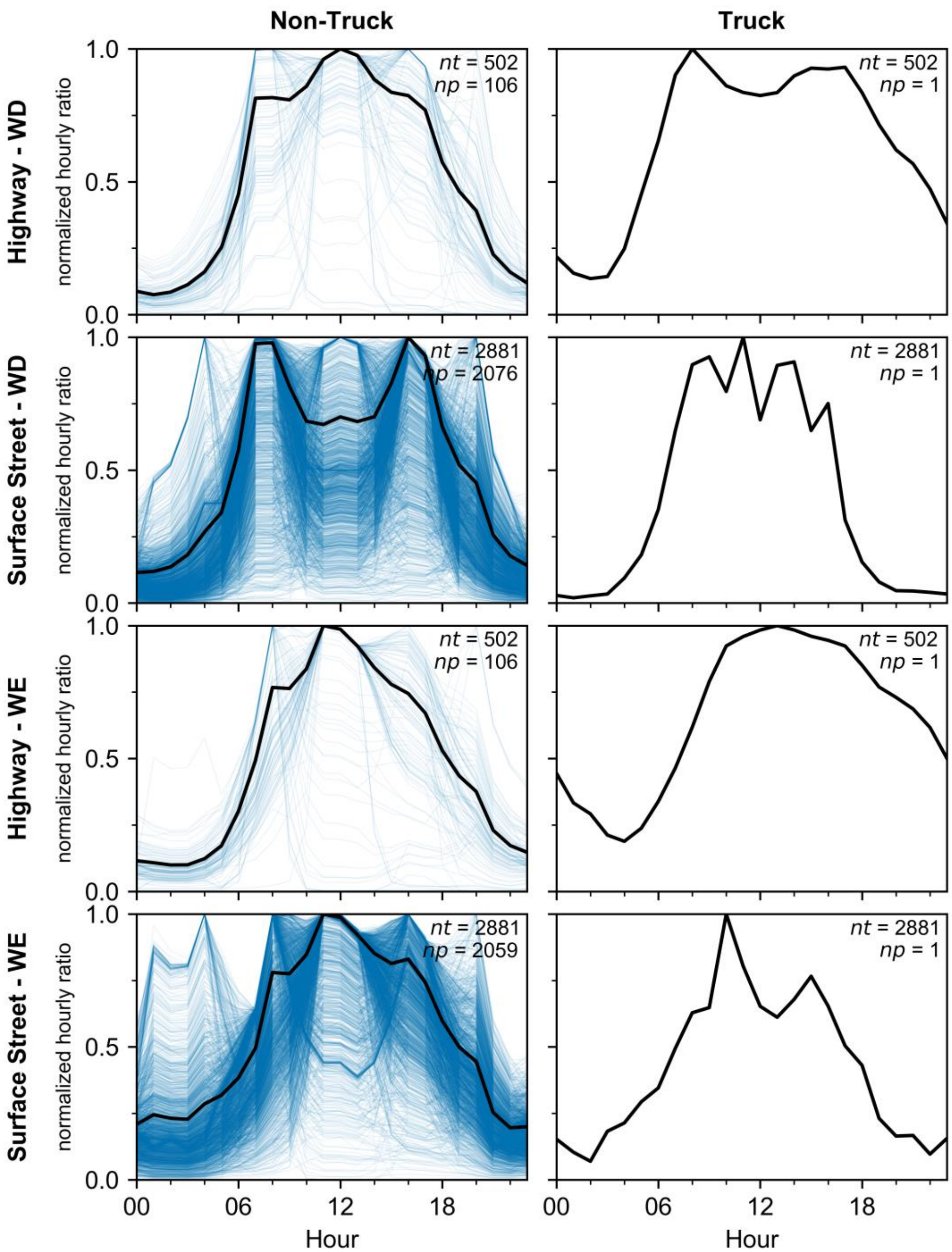


Figure 3-6. Diurnal emission profiles used for individual roadway segments in the West Oakland community normalized by maximum hourly volume. Profiles differ by road type (Highway, Surface Street) and day type (WD, WE) (rows), and vehicle category (Non-Truck, Truck) (columns). The number of unique profiles (np) and total number of roadway segments (nt) is annotated for each case. Individual profiles by roadway segment are plotted (thin blue lines), as well as the average profile (thick black lines); in cases where $np > 1$, the average profile is for illustrative purposes only. For unit emissions modeling, profiles normalized to the average daily traffic volume were used.

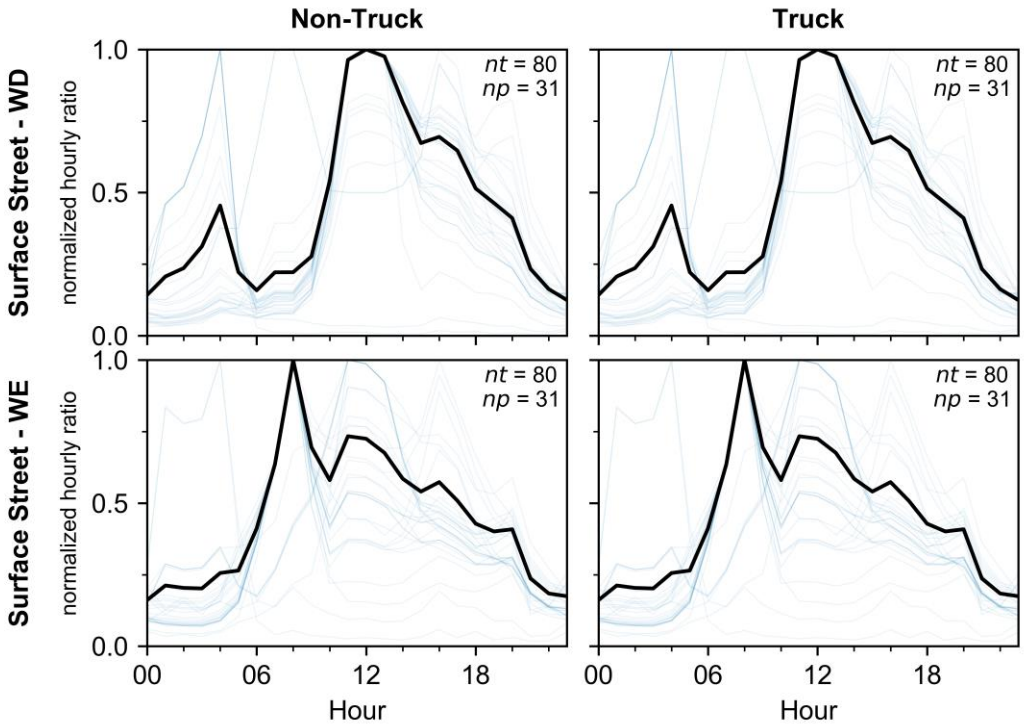


Figure 3-7. As in Figure 3-6, but for roadway segments in the Port area.

3.4.4 Truck-Related Businesses

Groups of idling vehicles in the same location can be modeled as an area source (U.S. Environmental Protection Agency 2015c). Emissions from truck activity at businesses with truck fleets (Attachment 3) were modeled as area sources. The areas were manually developed using satellite imagery, and then verified using Google Street View. The activity within these areas was associated with idling only; therefore, dispersion parameters were calculated as in Section 3.4.3, but with γ = 1 (no vehicle-induced turbulence, which aligns with modeling guidance provided in U.S. Environmental Protection Agency (2015c)). The height of all trucks was assumed to be 4.0 m, which results in $Szinit$ = 1.86 m, and $Relhgt$ = 2.0 m. Emissions from truck-related businesses were assumed to be evenly distributed from 8:00 AM to 5:00 PM on Monday through Saturday (no activity on Sunday).

Emissions from truck activity at Schnitzer Steel was also modeled as an area source (Figure 3-8); this includes emissions from all emission processes, where applicable (running exhaust, idling exhaust, tire wear, brake wear, and road dust). The area was determined from satellite imagery so that it would not encompass the buildings or stockpiles. A release height of 5.5 m and an initial vertical dispersion coefficient of 2.558 m was used, consistent with modeling performed in California Air Resources Board (2008a). Emissions were evenly distributed over the hours of operation: 4:00 AM to 3:30 PM for Monday through Friday, and 5:00 AM to 12:00 PM on Saturday, with no activity on Sunday.

Figure 3-8. Area source polygons used to model emissions from truck-related businesses. The "S" indicates the location of Schnitzer Steel.

3.4.5 Ocean-Going Vessels

Emissions from maneuvering and berthing OGVs were modeled as two-dimensional area sources that were associated with specific terminal operators. Based on information provided by Ramboll (2018), Port-related OGV emissions were spatially allocated based on AIS records of ship positions in 2017 (2017 NOAA Cadastre AIS dataset). AIS relies on satellite positioning to track locations of commercial marine harbor crafts and large ships, which is required since 2016.[59] The AIS ship position records for ships headed to and from all Port berths were plotted, and the polygons were drawn around the bulk of the data points. For maneuvering and berthing, the positions of ships that headed to and from the four Port terminals were plotted to provide a guide to normal operating zones (by terminal). Spatial allocations according to operating mode were made as follows:

- OGV maneuvering emissions were assigned to polygons extending from the Inner and Outer Harbor channels and towards the entrance to these channels and the Bay Bridge (Figure 3-9). These polygons were defined to represent the most likely maneuvering areas applicable to each terminal operating during 2017 (TraPac, Nutter, OICT, and Matson).

[59] https://www.navcen.uscg.gov/?pageName=AISRequirementsRev.

- OGV berthing emissions were assigned to polygons at each terminal berth (Figure 3-10). Emissions were allocated between terminals based on the vessel call data from the 2017 SFMX Berth Report.

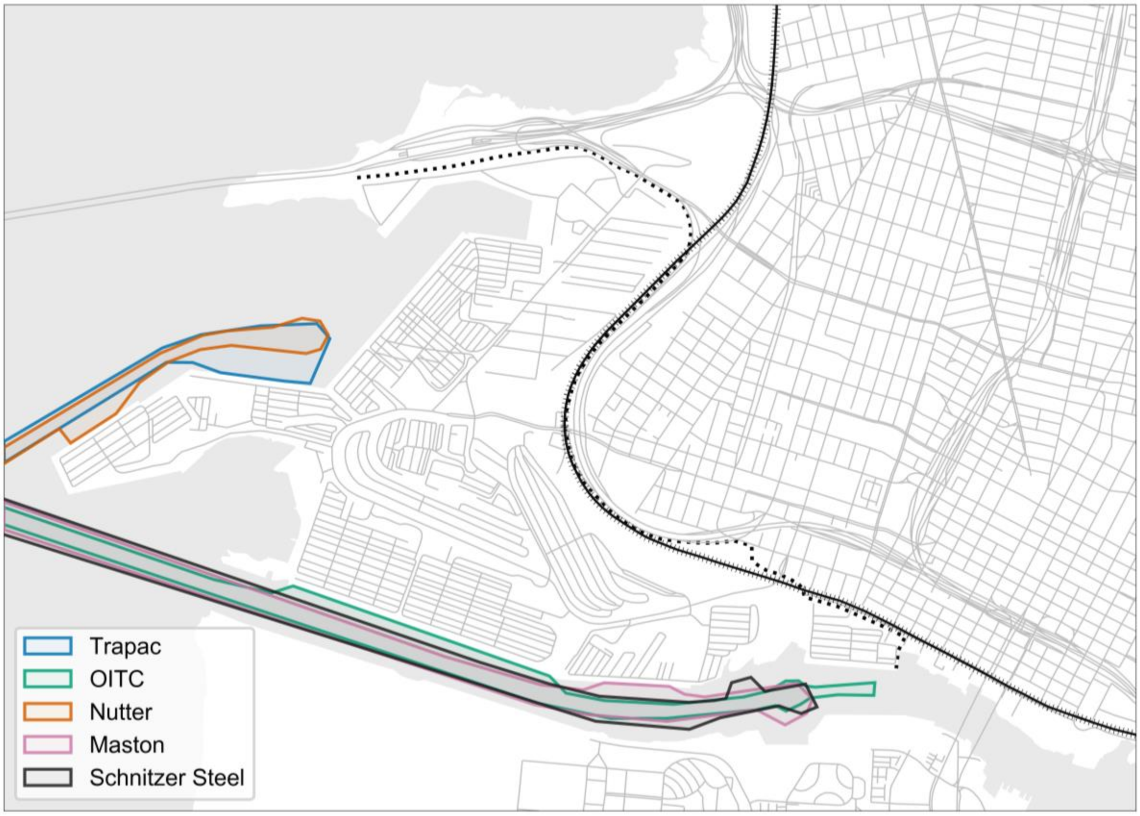


Figure 3-9. Area source polygons used to model emissions from OGV maneuvering.

An initial release height of 50 m was used for both OGV maneuvering and berthing activities. Emissions by activity were then temporally allocated by hour of day (ship call and twenty-foot equivalent unit (TEU) cargo volume throughput data showed little seasonal variation). A diurnal profile was developed for OGV maneuvering activity based on an analysis of hourly vessel movements (Figure 3-11). The highest frequency of arrival and departure times occurred near the start of labor shifts;[60] therefore, maneuvering emissions were assigned hour-specific allocation factors based on the arrival/departure frequency pattern. OGV berthing emissions at the Port were assigned a constant diurnal profile.

Emissions from OGV transiting and maneuvering for ships to Schnitzer Steel were also modeled as an area source, which was approximated based on the spatial coverage of OGVs transiting to the Port. All OGV activities from Schnitzer Steel (transiting, maneuvering, hoteling) were modeled with a release height of 37.5 m, and emissions were assumed to be constant in time.

[60] Based on AIS records, a median of 23 min before ship arrival (denoted by 'first line on' time stamp in the SFMX berth report) and 19 min after departure ('last line off') was used to estimate the relative number of events by time of day for this mode within the Source Domain.

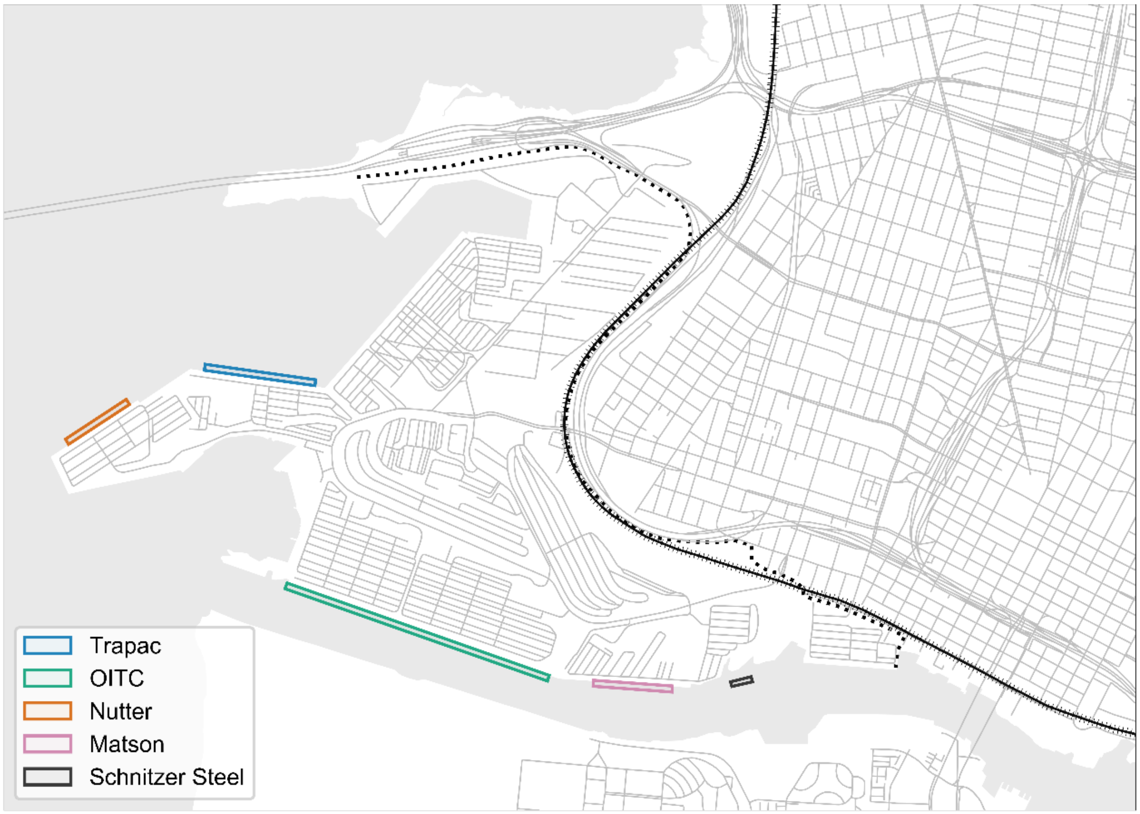


Figure 3-10. Area source polygons used to model emissions from OGVs at berths.

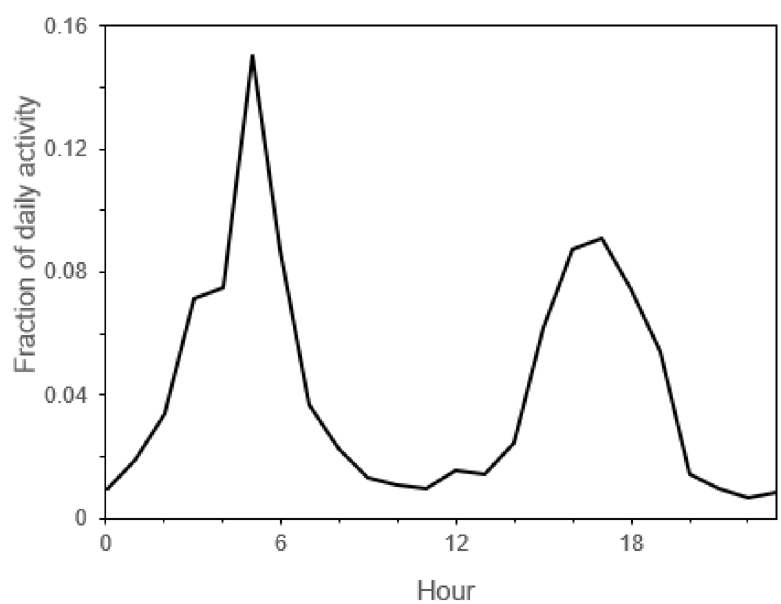


Figure 3-11. Diurnal emissions profile of Port OGV maneuvering. The profile is based on activity data from the 2017 Port Inventory.

3.4.6 Commercial Harbor Crafts

Emissions from all types of CHCs were modeled as area sources, while the spatial and temporal allocations of emissions varied by vessel type.

Dredging operations were assigned to two separate ship channels and berthing areas where these activities occurred (Figure 3-12). The area of the activity was created based on OGV AIS ship positioning information, which occurred near the main channel areas and berths that were dredged in 2017; the area was then extended to include unused Berths 23 and 24 in the Outer Harbor, and exclude the Berths 67 and 68 (which are rarely used).[61] Emissions were then allocated temporally based on the dredging schedule in 2017; dredging only occurred on 153 days (from January – February, and from August – December), and during daylight hours (8 AM – 6 PM). A release height of 6 m was used, with $Szinit$ = 4.744 m (consistent with California Air Resources Board (2008a)).

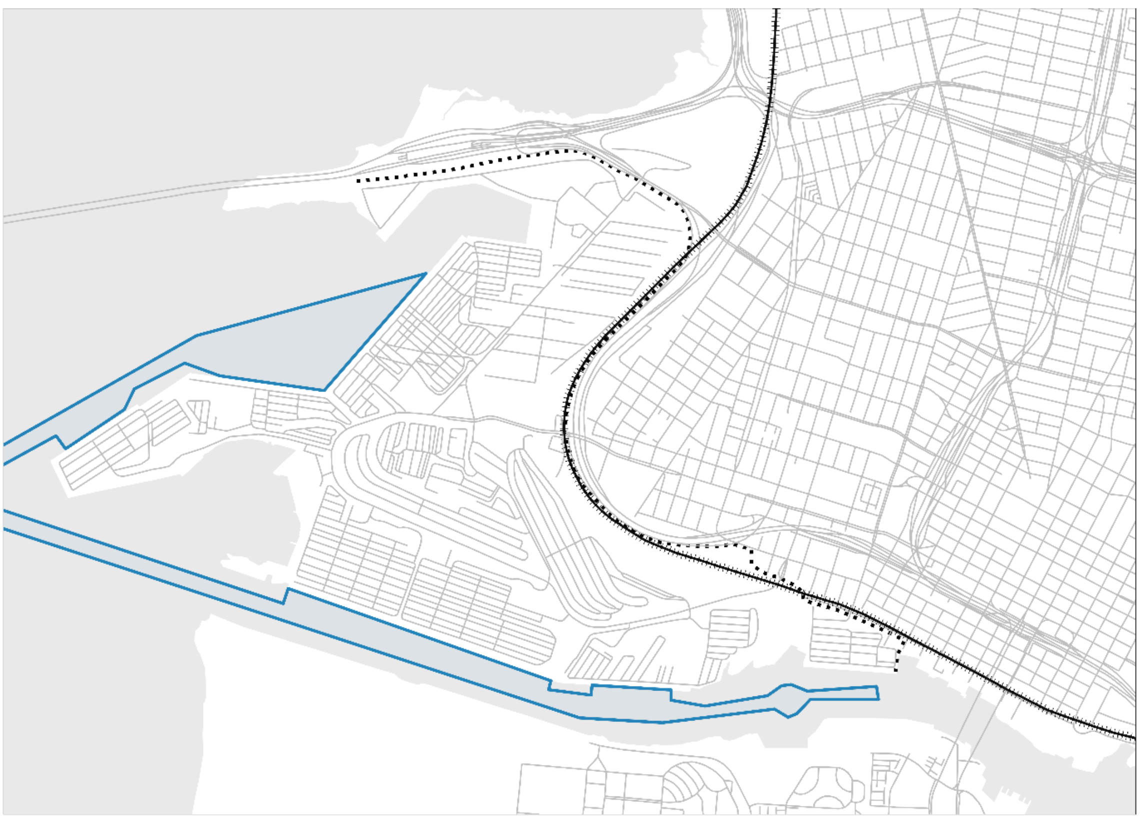


Figure 3-12. Area source polygons used to model emissions from dredgers.

Two areas sources were defined for assist tug operations, with one area representing tugs from the companies AMNAV Maritime Services, BayDelta, Crowley, and Foss Maritime, and the other representing tugs from Starlight Marine Services (Figure 3-13). Areas were derived based on AIS vessel position records during maneuvering and transit between the companies' base locations

[61] Based on communication with the company who performed the dredging.

(Table 2-18) to the Port. Emissions from assist tugs were temporally allocated in the same manner as OGV maneuvering (Section 3.4.5). A release height of 6 m was used, with $Szinit$ = 4.744 m (consistent with California Air Resources Board (2008a)).

Bunkering barges and bunkering pumps by terminal operator were assumed to operate in the same areas previously defined for OGV maneuvering and berthing, respectively (see Figure 3-9 and 3-10). Based on monthly bunkering events in 2017 (provided by Ramboll), emissions from bunkering varied by 6.4% to 9.6% on a monthly basis; for simplicity, emissions from bunkering activities were then assumed to be constant over the entire year. Emissions from bunkering barges were temporally allocated in the same manner as those from OGV maneuvering (Figure 3-11), whereas emissions from bunkering pumps were assumed constant.

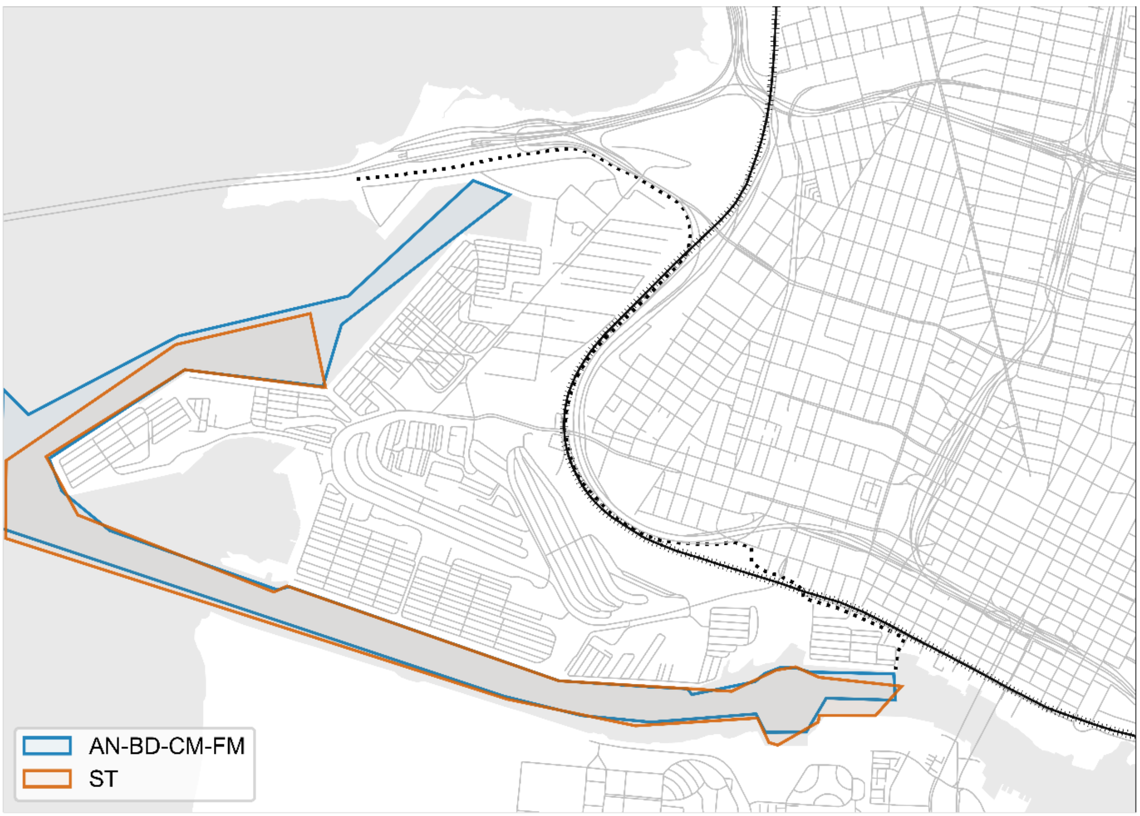


Figure 3-13. Area source polygons used to model emissions from assist tugs. Activity from AMNAV Maritime Services, BayDelta, Crowley, and Foss Maritime (AN-BD-CM-FM), and Starlight Marine Services (ST) were modeled separately.

3.4.7 Cargo handling equipment

Emissions from CHE were assigned to areas encompassing four terminals at the Port operating in 2017 (Figure 3-14). Emissions from CHE in the BNSF railyard were also accounted for. Based on California Air Resources Board (2008a), a release height of 5.5 m and an initial vertical dispersion coefficient of 2.558 m was used. The operating hours (Table 2-23) were used to develop temporal profiles for AERMOD dispersion modeling.

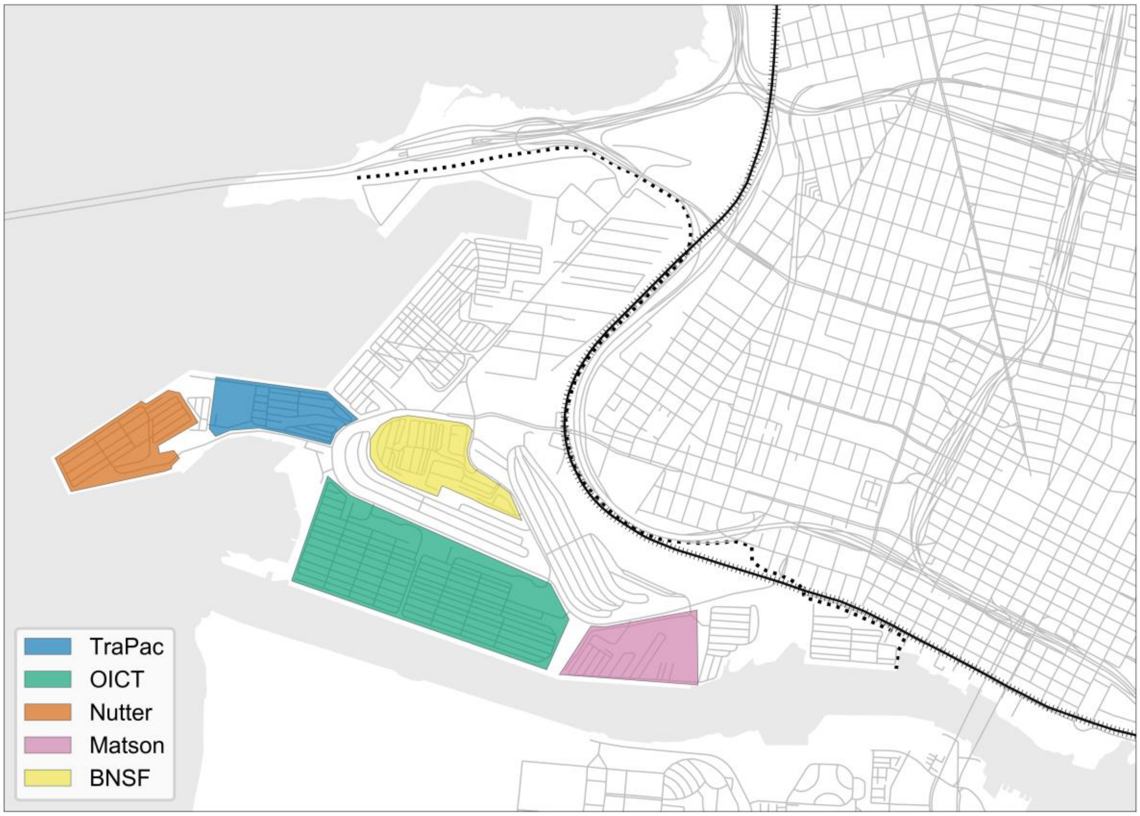


Figure 3-14. Area source polygons used to model emissions from CHE.

3.4.8 Port Trucks at Terminals

Emissions from Port Trucks operating within port terminals were assigned to source areas defined for BNSF Railyard (see Figure 3-16) and the same source areas defined for CHE (Figure 3-14). The same dispersion modeling parameters as CHE were used for Port Trucks ($Relhgt$ = 5.500 m, $Szinit$ = 2.558 m), as well as the same operating hours to temporally distribute the emissions (Table 2-23).

3.4.9 Locomotives (Rail Lines)

Emissions from locomotives on consolidated rail lines[62] in West Oakland were modeled as adjacent volume sources. A shapefile containing the geographic location of six rail lines in the West Oakland was used, which includes rail line segments with activity from BNSF and Amtrak. Volume source locations were developed using the algorithm described in Section 3.4.1(c), with a width of 6.25 m (width of locomotives plus wake effects). The release height of the locomotives was assumed to be 4.78 m (locomotive stack height). $Syinit$ and $Szinit$ were determined based on the equations used for on-road mobile sources (Section 3.4.3): $Syinit$ = 2.9070 m, and $Szinit$ = 3.7795 m. Emissions were assumed to be constant in time.

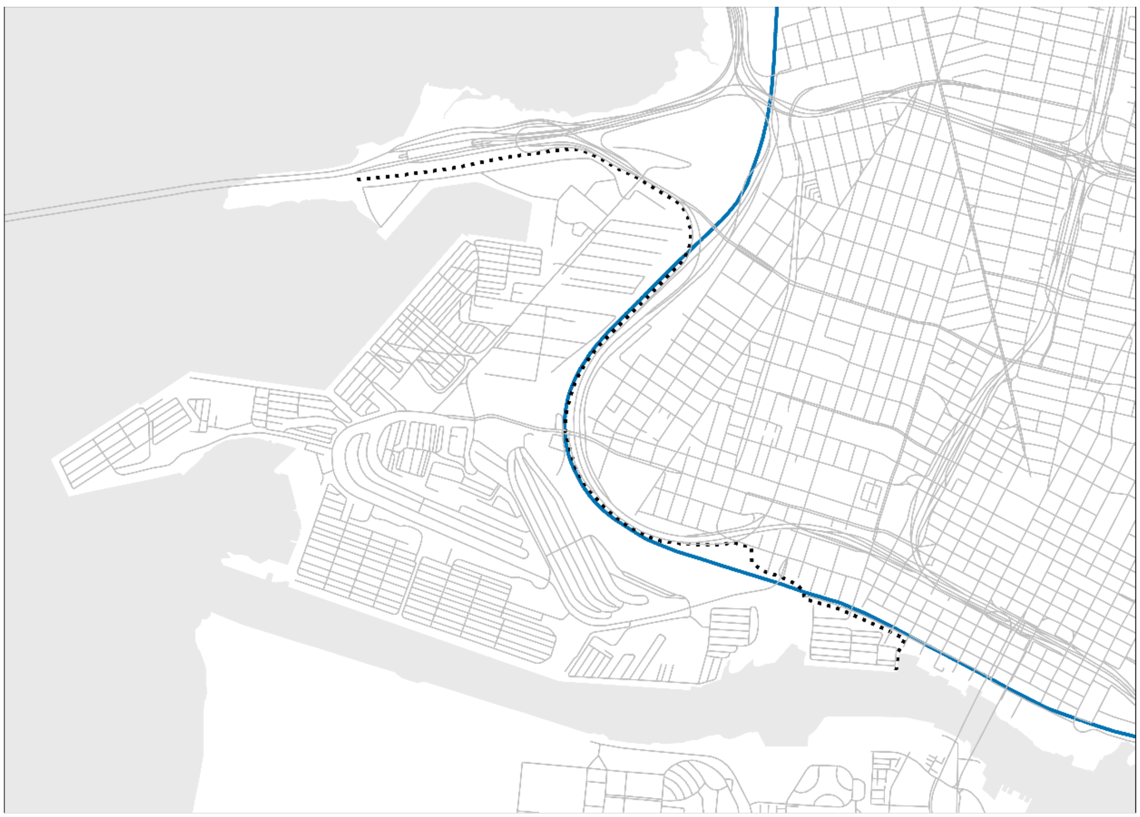


Figure 3-15. Locations of adjacent volume sources used to model emissions from locomotives. The size of the markers does not reflect the dimensions of the volume sources.

[62] For simplicity, emissions from all rail services (passenger, freight) were consolidated to single rail lines, which were then modeled in AERMOD. See Section 2.9 for further information.

3.4.10 Railyards

Emissions from three railyards were modeled as area sources (Figure 3-16). The BNSF and OGRE railyards are considered part of the Port, while the Union Pacific (UP) railyard is a separate entity. A release height of 4.78 m was used for locomotives operating at each of the railyards. $Szinit$ was set to 3.7795 m, based on the equations for on-road mobile sources (Section 3.4.3). Emissions were assumed to be constant in time.

Figure 3-16. Area source polygons used to model emissions from locomotives in railyards.

3.4.11 Commuter Ferries and Excursion Vessels

Emissions from commuter ferries and excursion vessels were modeled using adjacent volume sources; all parameters were the same for both types of vessels. A network of ferry routes was developed using satellite imagery (Figure 3-17), and volume source locations were determined using the algorithm described in Section 3.4.1(c). Guidance used for on-road mobile source emissions (Section 3.4.3) were also used to determine modeling dispersion parameters for commuter ferries and excursion vessels. A width of 10.56 m was used, based on the weighted average beam of the vessels in the commuter ferry fleet.[63] The release height was calculated as 9.0695 m, based on a stack height of 10.67 m (35 ft).[64] The resulting dispersion parameters were:

[63] Obtained from the WETA San Francisco Bay Fleet information at https://sanfranciscobayferry.com/sites/default/files/SFBFfleet.pdf (accessed December 2018).

[64] In 2017, the exhaust stacks on the types of commuter ferries operating from Oakland and Alameda were above passenger decks.

$Syinit$ = 4.9209 m, and $Szinit$ = 8.4367 m. Emissions for commuter ferries were temporally allocated based on their operating schedules by day of week;[65] this reflects only the operating hours of the ferries and not necessarily the level of activity by hour. Because of the variable schedule of excursion vessels, emissions were assumed to be constant in time.

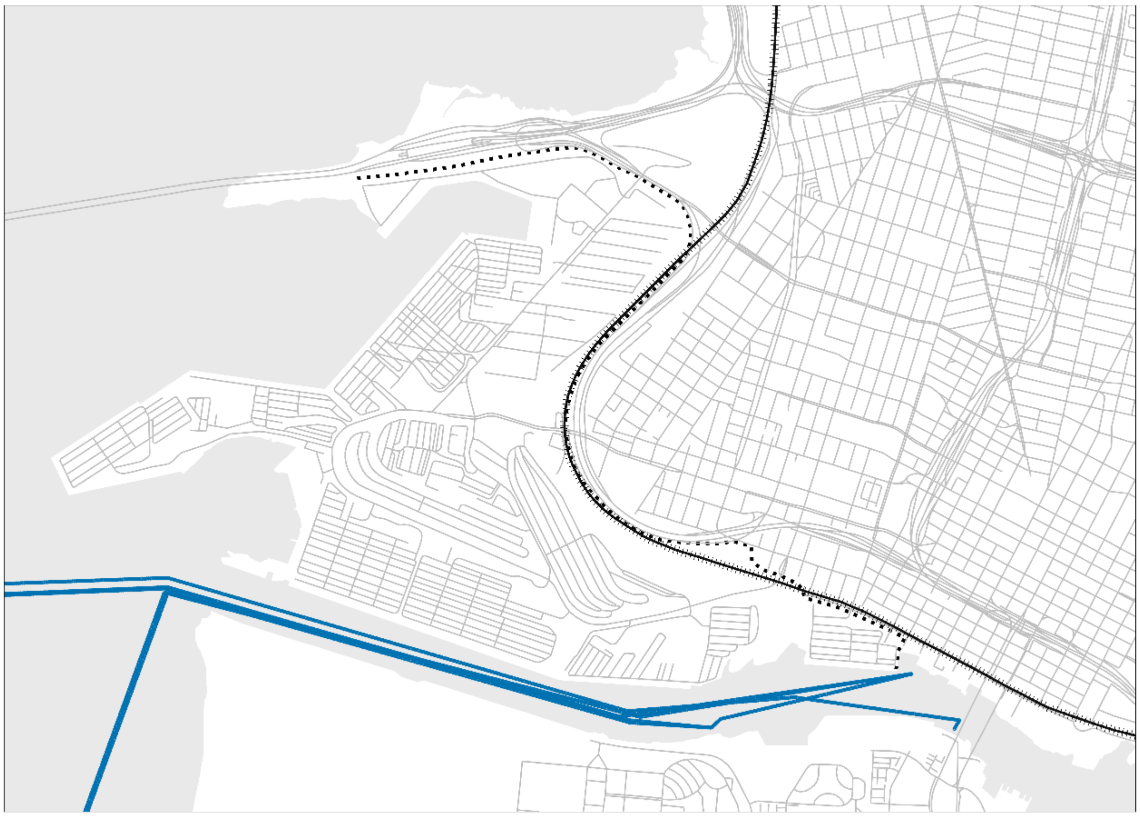


Figure 3-17. Locations of adjacent volume sources used to model emissions from commuter ferries and excursion vessels. The size of the markers does not reflect the dimensions of the volume sources.

Within the Source Domain, there are berths for both commuter ferries and excursion vessels. Emissions from ferry berths were modeled as area sources for AERMOD dispersion modeling (Figure 3-18). Because of the orientation of the exhaust stacks on some vessels, the release height was set to the physical height of the stack ($Relhgt$ = 10.67 m). Since berthing vessels are stationary, the initial vertical dispersion coefficient was calculated using $\gamma = 1$ (i.e., there is no motion-induced turbulence that will increase initial dispersion), resulting in $Szinit$ = 4.9620 m.

[65] Based on the WETA San Francisco Bay ferry schedule (effective January 7, 2019) https://sanfranciscobayferry.com/sites/sfbf/files/masterschedule010719.pdf (accessed February 2019). The temporal allocation is based on operating hours; it was assumed that the operating hours were similar to those in 2017–2018.

Figure 3-18. Area source polygons used to model emissions from ferries and excursion vessels at berths.

3.5 Receptors

A master receptor grid was generated with receptors spaced every 20 m in the *x* and *y* directions within the Receptor Domain (Figure 3-3), resulting in 52,671 discrete cartesian receptors.[66] A spacing of 20 m was deemed sufficient to resolve the spatial concentration gradients around small emissions sources (e.g., roadways) and the spacing of city blocks, which are on the scale of tens of meters; it is also consistent with the "dense" spacing suggested for a PM hot-spot analysis around roadways (U.S. Environmental Protection Agency 2015b).

As mentioned, the height of each receptor was set to 1.8 m agl. AERMAP was run to assign terrain elevations (m asl) and hill height scales to each receptor from Shuttle Radar Topography Mission (SRTM) digital terrain data (with an approximate resolution of 30 m × 30 m within 1° × 1° tiles), which are used to determine the dispersion of plumes in the vicinity of topographic features. The West Oakland area is relatively flat, where elevation is near sea level close to the Bay, and slopes upward gently towards the East (Figure 3-19).

[66] While the Source and Receptor Domains must align between models, the projections used are different (UTM in AERMOD, and Lambert conformal conic in CMAQ). Additional receptors were initially modeled (totaling 56,658 receptors), and then filtered so that only those within the Receptor Domain were used in subsequent analyses.

Figure 3-19. Elevation based on SRTM digital terrain data processed through AERMAP. Elevations are assigned to receptor locations only within the West Oakland Receptor Domain (blue polygon).

For emission sources modeled as point or area sources, the entire master receptor grid was used. For emission sources modeled as volume sources, individual receptors were removed from the master grid where they intersected a volume source EZ (Section 3.4.1(c)); results were imputed to these locations in a post-processing step (see Section 4.4.1).

3.6 Background Concentrations

AERMOD provides estimates of pollutant concentrations associated with local sources in West Oakland. However, total pollutant concentrations in the community are also impacted by regional emissions sources that are located in other parts of Alameda County, the Bay Area, and beyond. To account for the impact of these regional emission sources on air pollutant concentrations in West Oakland, the U.S. EPA's Community Multi-scale Air Quality (CMAQ) model was applied at a 1-km grid resolution over the entire Bay Area (Figure 3-20). CMAQ is a complex photochemical grid model that simulates physical and chemical processes in the atmosphere to predict the airborne concentration of gases and particles, as well as the deposition of these pollutants to Earth's surface. CMAQ requires two primary types of input data: (1) meteorological information such as temperature, wind speeds, and precipitation rates; and (2) emissions estimates for all anthropogenic and natural emission sources in the modeling domain.

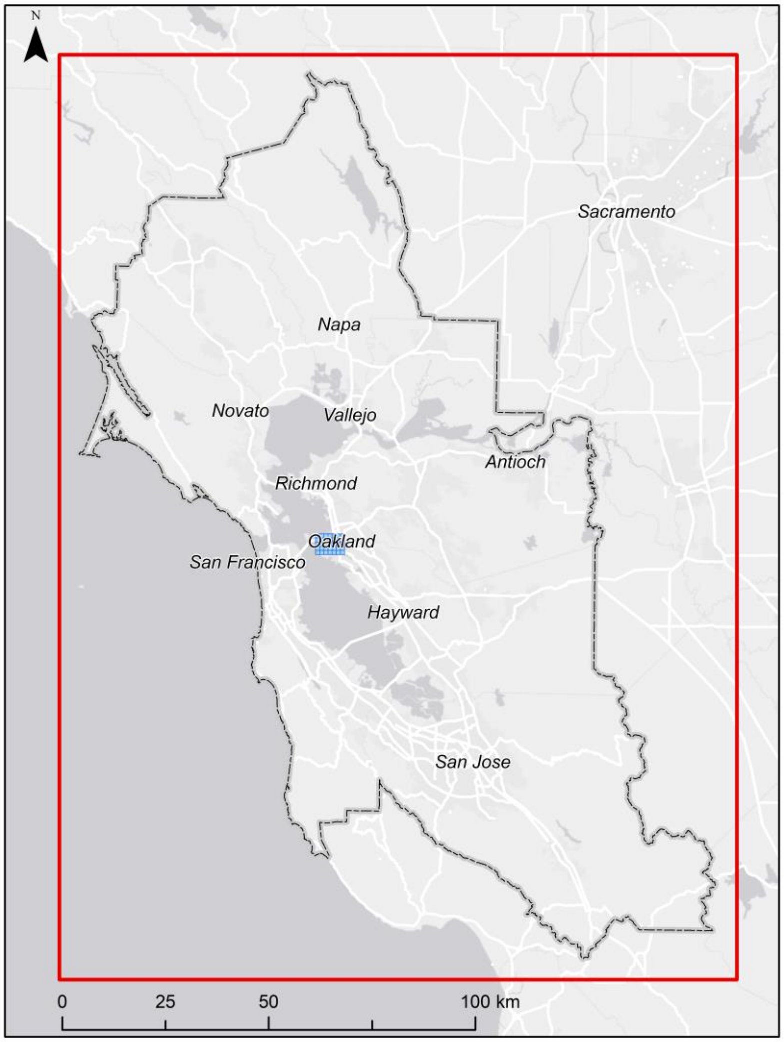


Figure 3-20. Regional-scale modeling domain (red rectangle). The subset of grid cells that comprise the community-scale (AERMOD) modeling are indicated by blue squares. The extents of the BAAQMD are also outlined (grey dashed line).

Meteorological inputs for CMAQ were prepared using the Weather Research and Forecasting (WRF) model version 3.8 (Skamarock *et al.* 2008). The WRF model configuration was tested using available physics options, including planetary boundary layer processes, strategies for assimilating meteorological measurement data into the simulations, horizontal and vertical diffusion parameters, and advection schemes. The final choice of options was the one that proved to best characterize meteorology in the domain based on a statistical evaluation. WRF model performance was evaluated by comparing model outputs to available meteorological data from the EPA's Air Quality System (AQS), the District's meteorological network, and the National Centers for Environmental Information (NCEI, formerly the National Climate Data Center [NCDC]). These comparisons were conducted by using the METSTAT program[67] to statistically evaluate the performance of WRF using established metrics such as bias, gross error, root mean square error

[67] version dated December 9, 2013; retrieved from Ramboll Environ: http://www.camx.com/download/support-software.aspx

(RMSE) and index of agreement (IOA). WRF's performance was determined to be within established criteria for these metrics for every day of 2016.

Emissions inputs for CMAQ were assembled from a variety of data sources, including the District's estimates, emissions data from CARB, outputs from CARB's EMFAC2017 model, and outputs from EPA's Biogenic Emission Inventory System (BEIS) version 3.61. These emissions data were processed through the Sparse Matrix Operator Kernel Emissions (SMOKE) processor (Houyoux and Vukovich 1999) version 4.5[68] to develop CMAQ-ready emissions inputs for each day of 2016. SMOKE uses a variety of processing steps to convert "raw" emissions data to the spatial, temporal, and chemical resolution required by CMAQ or an equivalent air quality model. For example, SMOKE disaggregates TOG and $PM_{2.5}$ emissions into a series of model species that CMAQ uses to represent atmospheric chemistry.

For the Bay Area regional modeling, speciation profiles developed for the SAPRC-07 chemical mechanism were applied to TOG emissions from all sources, and profiles developed for the AERO6 aerosol module (AE6) were applied to $PM_{2.5}$ emissions from all sources. The SAPRC-07 mechanism treats some toxic species explicitly, including acetaldehyde, benzene, and formaldehyde, while others are lumped into model species that act as surrogates for multiple compounds with similar mass and reactivity. Therefore, existing SAPRC-07 speciation profiles were modified to treat additional air toxics (acrolein and 1,3-butadiene) explicitly. In addition, AE6 profiles were modified to track DPM emissions separately from other PM emissions. Lastly, emissions estimates for five trace metals that are not included in the AE6 mechanism (cadmium, hexavalent chromium, lead, mercury, and nickel) were taken from EPA's 2014 National Air Toxics Assessment (NATA) inventory.

Once all inputs were prepared, CMAQ version 5.2 (U.S. Environmental Protection Agency 1999) was run to simulate $PM_{2.5}$ and TAC concentrations for the Bay Area for 2016. CMAQ model performance was evaluated by comparing model outputs to available ambient data from the District's Data Management System and the EPA's AQS. Various statistical metrics were used to evaluate the performance of CMAQ, in keeping with EPA's latest modeling guidance (U.S. Environmental Protection Agency 2018a). The CMAQ model performed reasonably well, meeting the performance goals proposed by Boylan and Russell (2006) and criteria by Emery *et al.* (2017), two well-known references for PM model evaluation. The model also showed reasonable agreement with the limited air toxics observations that were available for comparison.

The modeling framework was run (a) with emissions in the West Oakland Source Domain to obtain the total concentrations over the community and perform the model evaluation, and then (b) without emissions to provide an estimate of background pollutant levels in West Oakland. From (b), CMAQ results for the 1-km grid cells in the West Oakland Receptor Domain were extracted and analyzed to develop average background concentration values for the community. The background values for $PM_{2.5}$, DPM, and cancer risk, which represent expected levels in the absence of any local emissions in West Oakland, are summarized in Table 3-3.

[68] For further information and technical documentation, see https://www.cmascenter.org/smoke/documentation/4.5/manual_smokev45.pdf

Table 3-3. Background pollutant concentrations and cancer risk for West Oakland. Values are derived as an annual average across all grid cells in the Receptor Domain.

Parameter	**Value**	**Units**
$PM_{2.5}$ concentration	6.9	$\mu g/m^3$
DPM concentration	0.46	$\mu g/m^3$
Cancer risk	421	Additional cancer cases per million people

Additional information on the CMAQ simulations are available in separate reports on the District's 2016 $PM_{2.5}$ modeling (Tanrikulu *et al.* 2019a) and air toxics modeling (Tanrikulu *et al.* 2019b).

4. Analysis Methods

In this section, the methods applied to determine pollutant concentrations and cancer risk from emission sources that were identified, quantified, and provided as inputs to dispersion models are outlined. The approach used to aggregate and display the results are also described.

4.1 Estimating Pollutant Concentration and Cancer Risk

4.1.1 Totals at Receptors

The total of a quantity at a receptor can be calculated by summing the contributions from all sources; based on the community-scale (AERMOD) dispersion modeling, this represents the local contribution to a total quantity, as in Figure 1-2. This can also be expressed mathematically; that is, the *incremental contribution* from a specific emissions source s_j (where j is the index of any individual source modeled in AERMOD) to the total of quantity Y (which may a dispersion factor, F; pollutant concentration, C_p; or cancer risk, $risk$) at a receptor r_i (where i is a location index, and r_i is located at coordinates (x_i, y_i, z_i), and $z_i = 1.8$ m at all receptors in this analysis) can be denoted as: $Y_{ij} \equiv Y(r_i,\ s_j)$. The total quantity of Y_i is then the sum over all contributions from all sources:

$$Y_i = \sum_j Y_{ij}$$

However, as previously explained, individual receptors were removed from the master "grid" (a set of receptors placed every 20 m) where they intersected a volume source EZ (used for modeling on-road mobile sources, locomotives along rail lines, and commuter ferries and excursion vessels). This means that if using only the direct model outputs, at some receptors, Y_i can only be partially summed over all sources because the incremental contribution from some sources was not sampled at r_i. Therefore, dispersion factors were imputed at locations of receptors from the master grid that were removed for AERMOD modeling in these instances. Because the receptors that were removed from EZs are likely in areas of high concentrations (since they are closest to emission sources), values at receptors were imputed using the local maximum dispersion factors from a set of $k_{max} = 8$ closest receptors filtered within a distance (radius) of $d_{max} = 28.78$ m (the maximum diagonal distance between two receptors plus 0.5 m); the final number of receptors is therefore $k \leq k_{max}$. If no receptors were available within d_{max}, the value was imputed using the IDW with a power value of two (i.e., inverse distance squared weighting, IDW2) from the k_{max} (or $k \leq k_{max}$ if only k receptors were defined) nearest receptors. The resulting values at receptors could therefore be derived from a mix of local maxima and IDW2 interpolation.

To assess the air quality at receptors, the total pollutant concentrations of $PM_{2.5}$ and DPM were calculated, as well as cancer risk. While the summation technique is identical, calculating the values of each quantity at each receptor requires additional information with respect to emission rates and toxicity, as detailed in the following sections.

4.1.2 Pollutant Concentration

The concentration of a pollutant at each receptor location was calculated for a modeled source by multiplying annual average emission rate of a pollutant from a source by the dispersion factor from the source. At each receptor r_i from each source s_j, the concentration of pollutant p is then:

$$C_{pij} = ER_{pj} \cdot F_i$$

where

C_p	=	Annual average concentration for pollutant p ($\mu g/m^3$)
ER_p	=	Annual average emission rate for pollutant p [$g/(s\ m^2)$ for area sources, g/s for point and volume sources]
F	=	Dispersion factor, concentration per unit emission rate [$(\mu g/m^3)/(g/(s\ m^2))$ for area sources, $(\mu g/m^3)/(g/s)$ for point and volume sources]

The concentration contributions can then be summed over all sources at a receptor to obtain the total concentration from local sources.

4.1.3 Cancer Risk

Cancer risk is the incremental probability that an individual will develop cancer over a lifetime as a direct result of exposure to potential carcinogens from anthropogenic sources. The estimated risk is a unitless probability, often expressed as the number of people who might experience cancer per million people who are similarly exposed (a value "in-a-million"). Chemical species included in the dose calculate include acrolein, benzene, DPM, ethylbenzene, hexane, naphthalene, toluene, and xylene, among others (see Attachment 1); the type of TAC emitted depends on the emissions source.

The risk assessment method used here follows guidelines from the California EPA (CalEPA) Office of Environmental Health Hazard Assessment (OEHHA) and the risk management guidance for stationary sources adopted by the CARB and the California Air Pollution Control Officers Association (CAPCOA). Cancer risk was calculated over an assumed 70-year lifetime by multiplying the annual average chemical concentrations of TACs by the chemical intakes and chemical-specific cancer potency factors (CPFs)[69] (Attachment 1). The chemical concentrations were modeled from the emission sources to the exposure point at the downwind locations (receptors). Contributions from all emissions sources (Section 2) were aggregated to determine the cumulative risk. The District assumed that all emissions sources would remain operational for 30 years at the same level of emissions (the District has previously adjusted emissions for certain source categories where operations will be phased out); the District also assumed that emission factors for on-road mobile sources do not change in future years. The resulting analysis therefore represents a 'snapshot' of the level of cancer risk that would result from the base year emissions.

[69] A CPF is a chemical-specific "theoretical upper bound probability of extra cancer cases occurring in an exposed population assuming a lifetime exposure to the chemical" (Office of Environmental Health Hazard Assessment 2015).

The chemical intake or *dose* describes the frequency and duration of the exposure, estimated using the breathing rates, exposure durations, and exposure frequencies. In accordance with OEHHA's revised health risk assessment guidelines (Office of Environmental Health Hazard Assessment 2015), the intake methodology was updated to address children's greater sensitivity and health impacts from early exposure to carcinogenic compounds. The updated calculation procedures include the use of age-specific weighting factors, breathing rates, fraction of time at home, and reduced exposure durations. Each factor is described below:

- Age Sensitivity Factors (ASFs) account for the heighted sensitivity of children to carcinogens during fetal development and early childhood. Consistent with OEHHA, the District uses ASF values as listed in Table 4-1. The District has incorporated ASFs in its air permits since 2010.
- Daily Breathing Rate (DBR) is the age-specific daily air intake. OEHHA developed a range of rates for four age groups: last trimester to newborn, newborn to two years of age, two years to 16 years of age, and older than 16 years of age. CAPCOA and CARB recently recommended the use of 95th percentile breathing rates for the most sensitive age group (less than two years of age) and 80th percentile for all other age groups.
- Fraction of Time at Home (FAH) refers to the estimated amount of time residents stay at home. In past HRAs, the District assumed that residents are home 24 hours per day, 7 days per week. In the 2015 Risk Assessment Guidance, OEHHA recommends less than 100% of time to be used as a FAH based on population and activity statistics. Consistent with OEHHA, this analysis incorporates a FAH of 0.73 for individuals ≥ 16 years old and 1.0 for individuals < 16 years old to address exposures at local schools in close proximity to emitting facilities.
- Exposure Duration (ED) is the length of time an individual is continuous exposed to air toxics. Previously, the District used a 70-year lifetime exposure duration for residents over a 70-year lifespan. Based on updated demographic data, the District follows the OEHHA recommendation of a 30-year exposure duration, consistent with US EPA, for residents.

The values of these factors are summarized in Table 4-1.

Table 4-1. Factors used to calculate chemical intake, based on a 30-year average. Age intervals are left-bounded.

Factor	Unit	Age Groups			
		Last Trimester to Newborn	0 – 2 years old	2 – 16 years old	16 – 30 years old
DBR	L/(kg day)	361	1090	572	261
ASF	unitless	10	10	3	1
FAH	unitless	1	1	1	0.73
ED	years	0.25	2	14	14

The equation used to calculate the dose for the inhalation pathway of a pollutant p is as follows:

$$dose_{pij} = \frac{1}{AT}\left[c \cdot ef \cdot \sum_{y}^{30\,years} C_{pijy} \cdot DBR_y \cdot FAH_y \cdot ED_y \cdot ASF_y\right]$$

where

$dose_p$	=	accumulated dose for an individual breathing pollutant p for 30 continuous years [mg/(kg day)]
AT	=	averaging time [25,550 days, equivalent to 70 year lifespan]
c	=	conversion factor [10^{-6} (mg/m^3)/(µg/L)]
ef	=	exposure frequency (350 days per year[70])
C_{py}	=	annual average concentration of pollutant p during year y [µg/m^3]
DBR_y	=	daily breathing rate during year y [L/(kg day)]
FAH_y	=	fraction of time at home during year y [unitless]
ED_y	=	exposure duration of year y [years]
ASF_y	=	age sensitivity factor for year y [unitless]

The cancer risk from a pollutant (p) at a receptor (i) from a specific source (j) is equal to the dose multiplied by the chemical-specific inhalation CPF (Attachment 1):

$$risk_{pij} = CPF_p \cdot dose_{pij}$$

In most cases, CPF specific for the inhalation pathways were used. However, some chemicals, in addition to being inhaled, can deposit on the ground in particulate form and contribute to risk through ingestion of soil or through other routes. To account for the additional risks from exposure to non-inhalation pathways, multi-pathway CPFs were used where available from OEHHA. Risks were not estimated for chemicals lacking OEHHA approved toxicity values.

The total cancer risk is then the sum of the pollutant-specific risk values (p). These can be further summed over all emission sources (j).

4.2 Spatial Distributions and Source Apportionment

4.2.1 Source Apportionment

As modeling was performed for each emissions source separately (Section 3.1), the contributions from each source s_j to the quantity Y_i at each receptor r_i can be tracked and then compared to those contributions from other sources; this is generally termed a *source apportionment*. In this analysis, the results are already apportioned to sources by virtue of running each source individually in AERMOD.

[70] An ef of 350 days per year was used, which represents the number of days an individual will reside in their home less approximately two weeks of vacation. This value is consistent with current OEHHA and EPA guidance.

Furthermore, rather than examine the contributions at receptors from each individual source (e.g., a single generator, on-road mobile sources on individual roadways), contribution can be examined from *source categories* (e.g., permitted stationary sources, passenger vehicles on freeways). Sources within a source category may be similar in how they are managed or regulated, their emissions processes, their geographic locations, or are of particular research interest. An individual source can only belong to a single source category. Then, the total of a quantity at a receptor can be expressed as the sum of contributions from different source categories s_J, as:

$$Y_{iJ} = \sum_{j \in J} Y_{ij}$$

and $$Y_i = \sum_J Y_{iJ} = \sum_j Y_{ij}$$

4.2.2 Interpreting Map Products

Annual average $PM_{2.5}$, DPM, and cancer risk in West Oakland are presented in a series of maps and map-based products (tables and charts at different locations within the domain). When drawing conclusions from maps, it is important to consider the assumptions used to derive the underlying data.

Specifically, the maps were derived from air dispersion modeling that were used to calculate concentrations and cancer risk estimates from direct emissions. The maps themselves, therefore, portray concentrations associated with directly emitted $PM_{2.5}$ and DPM, as well as cancer risk associated with directly emitted TACs. The results do not reflect regional or long-range transport of air pollutants, nor the effects of the chemical transformation (formation or loss) of pollutants. However, some discussion of background concentrations resulting from those processes is provided (Section 3.6).

Finally, output from AERMOD at receptors represents a value sampled at a single point in space; that is, the values are not averages over grid cell volumes (as output from models such as CMAQ). Therefore, while results at regularly space receptors can be mapped as “grid cells” (raster), the values do not necessarily represent the average value over the area of the “grid cell.” The results at receptors also reflect the choice of flagpole receptor height (1.8 m); while some sources may emit a large quantity of pollutants, these pollutants may not necessarily impact receptors near ground-level if the release heights are much higher.

4.2.3 Spatial Aggregation

Receptors were placed every 20 m within the Receptor Domain to adequately capture concentration gradients around various sources. Results can be plotted as “grid cells” centered at each receptor. However, results summarized at larger spatial scales can be more useful when examining population exposures or proposed mitigation measures.

In this analysis, spatially aggregated results were generated by computing the arithmetic average within specific polygons, i.e., the sum from all source categories over all receptors within the polygon divided by the number of receptors. If a polygon contains a subset of receptors $n = |I|$ $(r_{i \in I})$, then:

$$Y_{IJ} = \frac{1}{n} \sum_{i \in I} Y_{iJ}$$

$$\text{and} \quad Y_I = \sum_J Y_{IJ}$$

Three types of spatial aggregation polygons were used, and further details of how they were defined are discussed below:

(1) **Hexagons** were used to form a complete "hexagon grid" of adjacent regular hexagons with a long diagonal of 100 m (incircle radius of 43.3 m);

(2) **Zone polygons** covering seven areas in the West Oakland community (Figure 4-1).[71] Within these zones, results were also presented as pie charts, where source categories were further aggregated for simplicity (Highways, Surface Streets, Port, Rail, Permitted, and Other); and

(3) **Census blocks** within the West Oakland community were namely used to obtain a population-weighted result (or "residential impact"). Population-weighted results can help emphasize how air pollution affects areas where residents live. For this approach, the TIGER polygons from the 2010 Decennial Census were used with corresponding 2010 population (Figure 4-2), and results were weighted by the population within the polygon as a proportion of the total population summed across all polygons.[72]

Results based on source category and spatial aggregations were combined into interactive maps, which can be used to represent the spatial variation of pollutant concentrations and cancer risk across West Oakland, and to represent the spatial variation of the incremental contributions from different source categories across West Oakland. Taken together, these results are intended to aid local planning efforts by identifying areas or sources where emission reductions may be needed and by providing information on the sources which are contributing to air quality impacts at specific receptor locations.

[71] These locations were selected in consultation with project co-leads and generally represent areas where pollutant concentrations are known to be elevated based on previous research and/or sensitive receptors.

[72] Although the absolute population of West Oakland has changed since 2010, the population-weighted results only depend on the relative spatial distribution of population among census blocks. Relative changes in this distribution during inter-decennial years (2011–2019) are difficult to estimate accurately; population data at the block level are not published as part of inter-decennial Census products (e.g., American Community Survey).

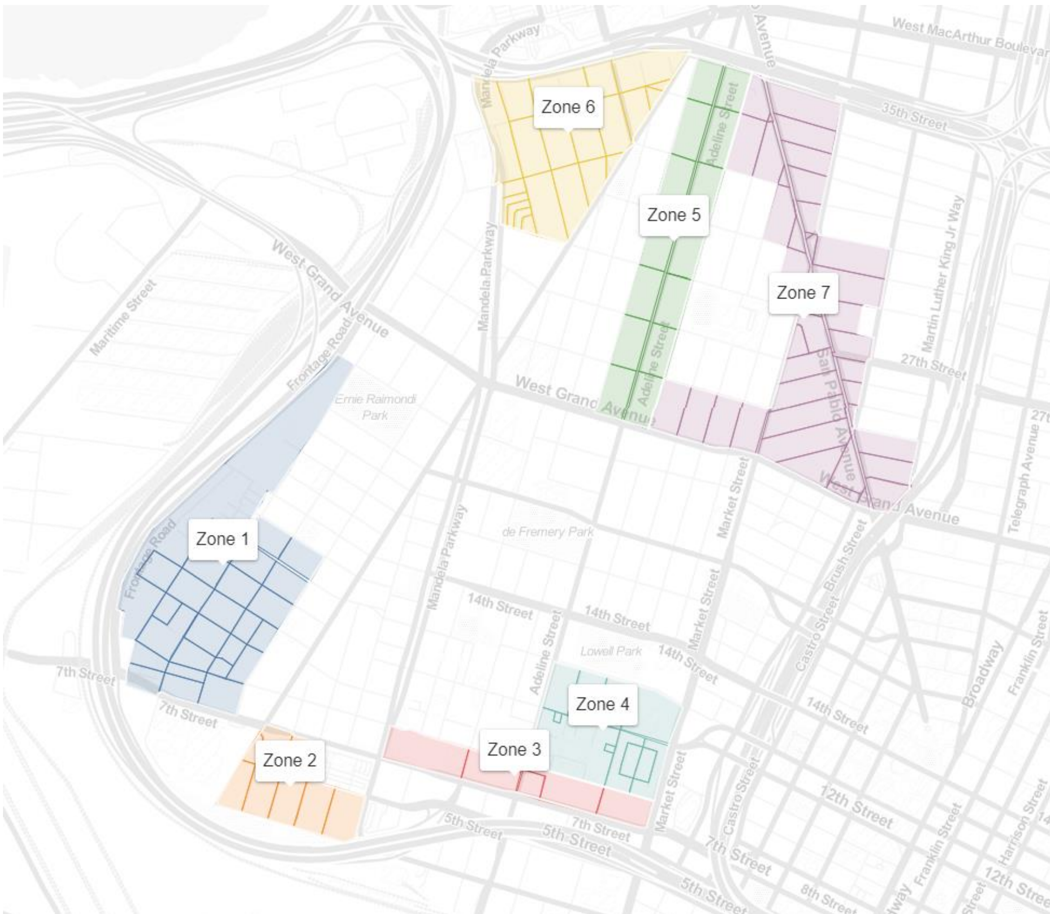


Figure 4-1. Zones in the West Oakland community used to assess air quality in this study: 1: Lower Bottoms / West Prescott, 2: 3rd Street, 3: 7th Street, 4: Acorn, 5: Upper Adeline, 6: Clawson, 7: West Grand & San Pablo.

Figure 4-2. Percentage of total population by census block in West Oakland, based on 2010 Decennial Census data. Total population for the census blocks examined in West Oakland in 2010 was 33,561 (based on 1,029 census blocks). Only census blocks within the West Oakland community boundary are outlined (blue lines); census blocks with no population are not colored.

5. Results

Annual average $PM_{2.5}$, DPM, and cancer risk results derived from dispersion modeling are presented in this section in a series of maps. Additionally, a source apportionment is performed where information is provided on the relative contributions of the source categories described in previous sections: permitted stationary sources, on-road mobile sources (by road type and vehicle category), Port-related sources (e.g., OGVs, CHE), locomotives on rail lines and at railyards, and other sources (e.g., truck-related businesses). All results are presented with respect to the total emissions represented in the community-scale emissions inventory as noted in Section 2.1.5, unless otherwise specified.

5.1 $PM_{2.5}$ Concentrations

Based on combined AERMOD results from all sources, the annual average $PM_{2.5}$ concentration associated with local sources in the West Oakland averaged over the community domain[73] was 1.71 μg/m^3, with concentrations exceeding 4 μg/m^3 in areas that are proximate to large emission sources and roadways (Figure 5-1). This annualized value reflects an average of all receptors in the domain; when the calculation is weighted by population in Census blocks (i.e., residential areas), the annual average $PM_{2.5}$ concentration increases slightly to 1.74 μg/m^3, largely due to the higher levels of road dust emissions in the residential areas.

The average local $PM_{2.5}$ concentration was 1.71 μg/m^3, whereas the background concentration was 6.9 μg/m^3 (Section 3.6), resulting in a total average $PM_{2.5}$ concentration of 8.61 μg/m^3. This value compares well with the annual average $PM_{2.5}$ concentration of 8.7 μg/m^3 measured at the West Oakland monitoring site (in 2016). Based on this modeling analysis, local sources account for about 19% of the annual average $PM_{2.5}$ concentration in West Oakland.[74]

5.2 DPM Concentrations

The annual average DPM concentration associated with local sources in the West Oakland was 0.39 μg/m^3, with concentrations exceeding 1 μg/m^3, namely in areas that are proximate to the Port and railyards (Figure 5-2). When the calculation is limited to receptors in residential areas, the annual average DPM concentration decreases to 0.25 μg/m^3, as the highest DPM concentrations are generally near the Port rather than residential areas.

The average local DPM concentration was 0.39 μg/m^3, whereas the background concentration (Section 3.6) was estimated as 0.46 μg/m^3, resulting in a total average DPM concentration of 0.85 μg/m^3 in West Oakland. Based on this modeling analysis, local sources account for about ~46% of the annual average DPM concentration in West Oakland.

---

[73] Results averaged over the "community domain" include all receptors within the Receptor Domain that intersect the Community Boundary (*c.f.* Figure 1-1, Figure 5-1). The Receptor Domain does not completely cover the Community Boundary; the areas that are excluded are mainly in the Port and over the Bay Bridge.

[74] This local contribution only accounts for directly emitted $PM_{2.5}$ emissions. However, it is likely that the secondary formation of $PM_{2.5}$ from precursor emissions in the West Oakland domain will largely occur beyond the boundaries of the domain.

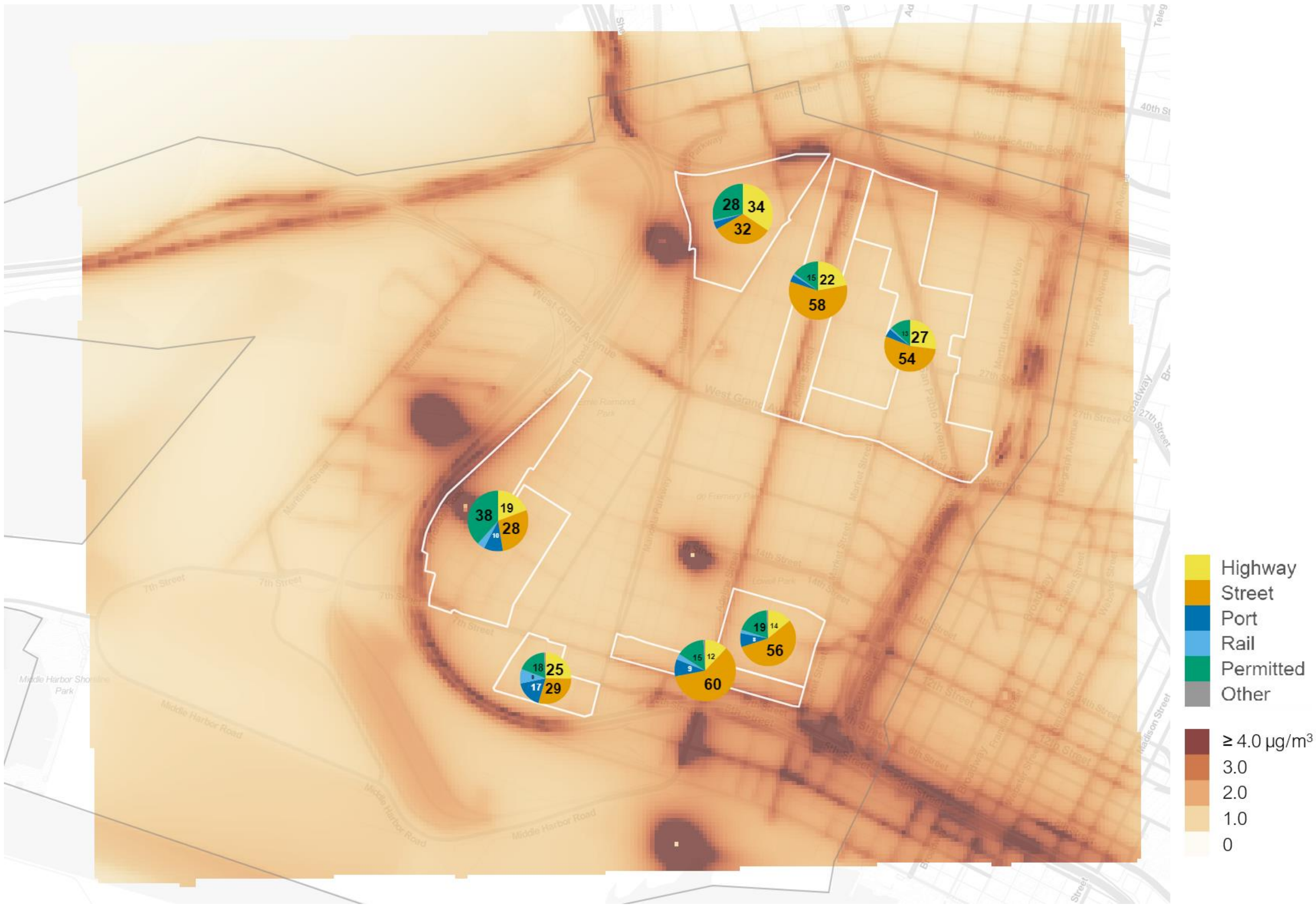


Figure 5-1. Annual average $PM_{2.5}$ concentrations associated with local sources in the West Oakland Receptor Domain (colored extents). Pie charts indicate the percentage of concentrations contributed from specific Source Categories in each zone (white polygons, Figure 4-1); the size of the pie chart indicates the total magnitude of the concentration. The grey line indicates West Oakland Community Boundary.

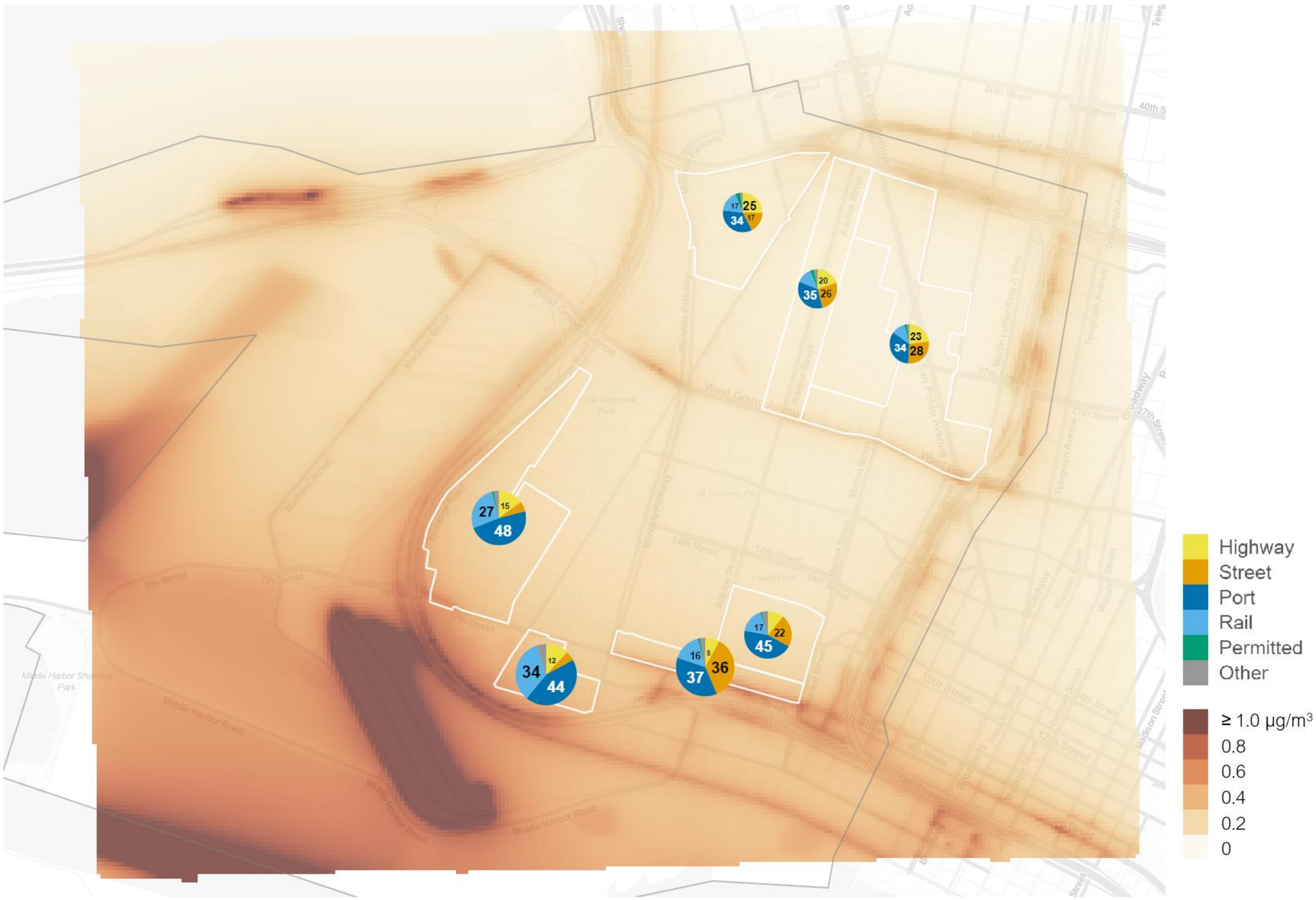


Figure 5-2. Annual average DPM concentrations associated with local sources in the West Oakland Receptor Domain (colored extents). Pie charts indicate the percentage of concentrations contributed from specific Source Categories in each zone (white polygons, Figure 4-1); the size of the pie chart indicates the total magnitude of the concentration. The grey line indicates West Oakland Community Boundary.

5.3 Cancer Risk

Based on combined AERMOD results from all sources, the excess cancer risk associated with local emissions sources in the West Oakland Source Domain was 307 cases in-a-million people, with risk values exceeding 1,000 in-a-million in areas that are proximate large emission sources, especially those that emit high levels of DPM (Figure 5-3). Furthermore, the annual excess cancer risk decreases to 203 in-a-million when weighted by population, as the highest air toxic concentrations are generally near the Port and the Schnitzer Steel facility rather than residential areas.

The total excess cancer risk in West Oakland is than 728 in-a-million, based on a background value of 421 in-a-million (Section 3.6) and a local value of 307 in-a-million. Based on this modeling analysis, local sources account for about ~42% of the excess cancer risk in West Oakland.

5.4 Source Apportionment

To support source apportionment analyses, AERMOD results for all sources were combined in a series of interactive maps that allow users to click on a location of interest and view a tabular summary of the contributions of individual local sources to the $PM_{2.5}$ concentration, DPM concentration, and excess cancer risk at that location. The percentage contribution from source categories to the domain-wide averages, and by location or zone were also generated (as depicted by the pie charts in Figures 5-1, 5-2, and 5-3).

Source contributions to the residential-weighted annual average $PM_{2.5}$ concentration (1.71 $\mu g/m^3$), annual average DPM concentration (0.39 $\mu g/m^3$), and excess cancer risk (307 in-a-million) are tabulated by emissions source category in Table 5-1. For $PM_{2.5}$, the main sources include road dust, passenger vehicles (especially on highways) and MHDT/HHDTs. Some stationary sources (e.g., Pinnacle Ag Services, Schnitzer Steel) also contribute a comparable amount. For DPM and cancer risk, the main source include MHDT/HHDTs, assist tugs, OGVs, and locomotives and railyard activity.

Source contributions to local $PM_{2.5}$ concentrations, DPM concentrations, and excess cancer risk within Zones in the West Oakland domain vary by location, and the interactive maps described above allowed users to investigate those variations. For example, while Zone 2 (3rd Street) and Zone 3 (7th Street) are close to each other (< 1 km), the proportions of difference source categories to the overall excess cancer risk within the zones varies considerably (Figure 5-3, Table 5-1).[75] Within Zone 2, key sources include those in the Port (especially assist tugs and OGVs) and rail (UP railyard and locomotives on rail lines). In contrast, within Zone 3, key sources include those in the Port (assist tugs and OGVs) and on-road mobile sources on surface streets (especially MHDTs/HHDTs).

[75] The results within two zones are presented here. Results at other sensitive receptors in West Oakland are available elsewhere.

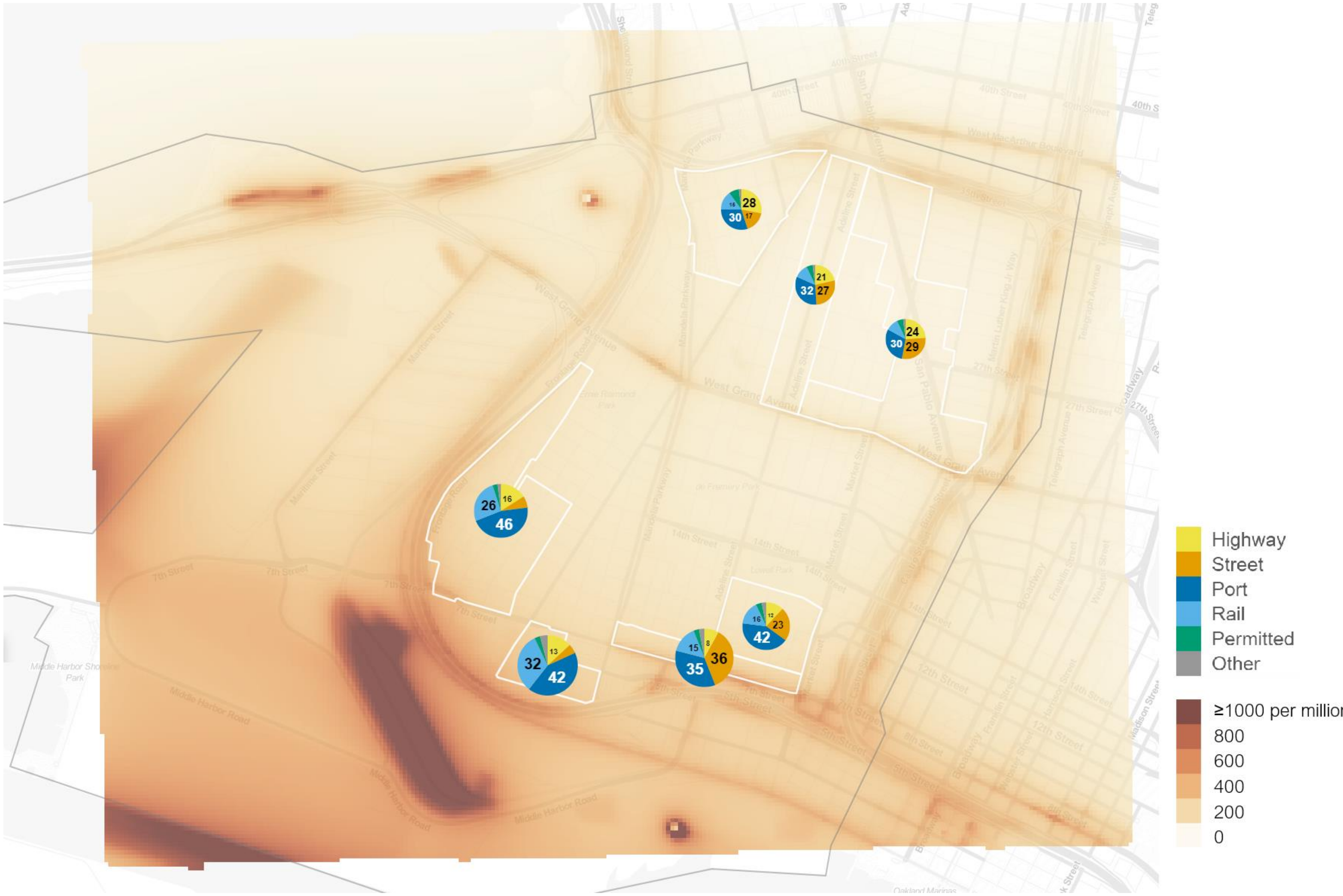


Figure 5-3. Annual average excess cancer risk associated with local sources in the West Oakland Receptor Domain (colored extents). Pie charts indicate the percentage of risk contributed from specific Source Categories in each zone (white polygons, Figure 4-1); the size of the pie chart indicates the total magnitude of the risk. The grey line indicates West Oakland Community Boundary.

Table 5-1. Source contributions to the annual average $PM_{2.5}$ and DPM concentrations and excess cancer risk across residential areas in West Oakland. Port Truck contributions represent those from Port Trucks on all roads and within Port terminals.

Source Category	$PM_{2.5}$		DPM		*risk*	
	µg/m³	% of total	µg/m³	% of total	per million	% of total
Highway						
Non-Trucks	0.242	14	0.004	1	6.5	2
LHDT	0.009	1	0.002	1	1.6	1
MHDT/HHDT	0.058	3	0.043	11	32.6	11
Road dust	0.103	6	-	-	-	-
Surface Streets						
Non-Trucks	0.107	6	0.002	1	4.0	1
LHDT	0.005	< 1	0.001	< 1	1.1	< 1
MHDT/HHDT	0.038	2	0.029	7	22.2	7
Road dust	0.395	23	-	-	-	-
Port						
OGV – maneuvering	0.023	1	0.023	6	16.9	6
OGV – berthing	0.053	3	0.038	10	28.3	9
Dredging	0.020	1	0.020	5	15.0	5
Assist Tugs	0.068	4	0.070	18	51.9	17
Bunkering (tugs, pumps)	0.003	< 1	0.003	1	2.5	1
CHE	0.027	2	0.027	7	20.0	7
Port Trucks	0.065	4	0.012	3	9.5	3
Railyard – OGRE	0.004	< 1	0.005	1	3.5	1
Railyard – BNSF	0.009	1	0.010	3	7.5	2
Rail						
Locomotives	0.026	2	0.028	7	20.5	7
Railyard – UP	0.057	3	0.062	16	46.0	15
Permitted						
CA Waste (10th Street)	0.029	2	-	-	-	-
California Cereal	0.034	2	-	-	< 0.1	< 1
CASS	0.005	< 1	-	-	< 0.1	< 1
Dynegy	0.001	< 1	< 0.001	< 1	< 0.1	< 1
EBMUD	0.056	3	0.002	1	1.6	1
Pinnacle Ag Services	0.095	6	-	-	-	-
Schnitzer Steel – stationary	0.090	5	-	-	5.4	2
Sierra Pacific	0.054	3	-	-	-	-
Other	0.022	1	< 0.001	< 1	2.4	1
Other						
Ferry/Excursion vessels	0.006	< 1	0.006	2	4.7	2
Schnitzer Steel – OGV	0.002	< 1	0.002	1	1.6	1
Schnitzer Steel – trucks	0.001	< 1	< 0.001	< 1	0.2	< 1
Truck-related businesses	0.002	< 1	0.002	1	1.6	1
Total	**1.709**	**100**	**0.392**	**100**	**307.1**	**100**

Table 5-2. Source contributions to excess cancer risk within Zone 2 (3rd Street) and Zone 3 (7th Street). Values have been rounded and may not necessarily sum to the values indicated in the Total row. Port Truck contributions represent those from Port Trucks on all roads and within Port terminals.

Source Category	Zone 2		Zone 3	
	per million	% of total	per million	% of total
Highway				
Non-Trucks	5.2	1	3.9	1
LHDT	1.7	< 1	1.1	< 1
MHDT/HHDT	37.7	11	22.0	7
Surface Streets				
Non-Trucks	3.6	1	8.1	2
LHDT	0.9	< 1	2.6	1
MHDT/HHDT	13.9	4	108.3	33
Port				
OGV – maneuvering	19.9	6	15.6	5
OGV – berthing	32.9	9	24.6	7
Dredging	14.0	4	10.0	3
Assist Tugs	51.2	15	39.9	12
Bunkering (tugs, pumps)	2.4	1	1.7	1
CHE	10.6	3	5.6	2
Port Trucks	8.2	2	12.5	4
Railyard – OGRE	3.2	1	1.9	1
Railyard – BNSF	5.0	1	2.4	1
Rail				
Locomotives	36.7	11	21.0	6
Railyard – UP	76.2	22	26.7	8
Permitted				
EBMUD	0.8	< 1	0.9	< 1
Schnitzer Steel – stationary	7.3	2	7.5	2
Other	1.2	0	1.6	< 1
Other				
Ferry/Excursion vessels	6.1	2	5.6	2
Schnitzer Steel – OGV	2.6	1	2.2	1
Schnitzer Steel – trucks	0.3	< 1	0.3	< 1
Truck-related businesses	6.7	2	0.9	< 1
Total	**348.3**	**100**	**326.9**	**100**

6. Limitations, Uncertainties, and Future Improvements

In this analysis, the District qualitatively evaluated uncertainties associated with the data and methodologies used to create a bottom-up emissions inventory for the West Oakland community, the community-scale modeling approach using the AERMOD dispersion model, and the approach used to quantify air pollutant exposure, cancer risk, and perform the source apportionment. Such assumptions are inherent in efforts to characterize emissions and associated risk in complex settings and can result in or under- or over-predictions in concentration and risk estimates. While a quantitative analysis of the uncertainties may provide more useful information as to the potential variability of impacts, it was beyond the scope of this analysis,[76] especially given that uncertainties for emissions and modeling parameters are generally not available. A qualitative assessment of uncertainties can be useful as a component of a model evaluation, where the quality of the output information (emissions, dispersion factors, concentration and risk calculations) are determined. The following sections summarize common sources of uncertainty associated with the emissions estimation, air dispersion modeling, and risk estimation components of the risk assessment.

6.1 Emissions Inventory

There are several sources of uncertainty associated with the bottom-up estimation of emissions from each of the source categories that may affect the subsequent estimation of exposure concentrations and risk characterization. The District identified several emission sources categories where emissions estimates could be improvement.

6.1.1 Permitted Stationary Sources

The emissions inventory for permitted stationary source in West Oakland was developed using the District's 2017 CEIDARS report. Rather than following a traditional calendar or fiscal year, the District issues permits to facilities on a rolling 12-month period, and renews those permits every one to three years. Because of this, the emissions shown in the 2017 CEIDARS report may represent a facility's emissions from either 2015, 2016, or 2017. Uncertainties associated with the emission estimates also stem from throughput information, which varies from year to year, and the use of default emission factors. The District did attempt to correct emissions for the largest emissions sources (such as Schnitzer Steel) to better reflect the latest source test results and upcoming facility modifications. The District will continue to make improvements to the stationary source database by incorporating source test results as they become available, and by updating emissions factors as necessary

6.1.2 On-Road Mobile Sources

For on-road mobile emissions, uncertainties are primarily associated with link-specific traffic activity, especially fleet mix, and emission factors for Port Trucks, as well as tire wear, brake wear, and road dust.

---

[76] The District is performing a quantitative evaluation of AERMOD dispersion modeling results for black carbon in a separate study.

(a) Fleet Mix

Estimates of fleet mix by roadway link, represented as the fraction of trucks of the total fleet, have significant uncertainties. On surface streets, truck fraction information relied on traffic counts from only four counters over a limited period (1 week) in 2008; the fleet mix could therefore be outdated, and the data from these counter locations may not be representative of all surface streets. On highways, while truck fractions were derived from PeMS, which has higher spatial and temporal coverage (e.g., based on a full year of continuous measurements at several counter locations on each highway), the method of detection still has inherent uncertainties: single loop detectors were used to estimate truck volume based on lane-by-lane flow and occupancy at 5 min resolution, instead of actual truck counts measured by the Automatic Vehicle Classifiers (AVCs) using technologies such as weigh-in-motion (WIM). WIM-based truck traffic counts were available at a limited number of locations but only in 2010, and were therefore not used in this analysis.

The fraction of Port Trucks within the Truck 2 category (MHDTs and HHDTs) was derived using O-D analysis on the StreetLight platform. Data on this platform is GPS-based, and the District designed 49 gates to best capture Port Truck activity in the West Oakland community. There is uncertainty in both actual traffic counts (as no evaluation was performed) and the limited spatial coverage of gates selected.

For the West Oakland community, the VMT-based overall Port Truck fraction within the Truck 2 category derived from StreetLight for 2017 is about half of that estimated in the 2009 truck survey. The decrease could be largely explained by the truck prohibition regulation the City of West Oakland has implemented since 2010. However, further verification is in need when the direct measurements in more recent years become available. For example, a study using video footage acquired from Automated License Plate Readers (ALPR) to collect vehicle counts and license plates at key locations in West Oakland could be used to better estimate the size and characteristics of the Port Truck fleet. The license plate data would provide the necessary information to link registration data from the Department of Motor Vehicles (DMV) or International Registration Plan (IRP) to a list of Vehicle Identification Numbers (VINs) from the Port of Oakland and the Drayage Truck Registry database, which could be used to obtain import vehicle characteristics (e.g., model year, weight class, emission control technologies, and whether the vehicle is a Port drayage truck or not). These characteristics could then be used to better estimate emission factors and emissions. If implemented, the proposed study would provide ground-truth to improve our understanding and help validate the fleet mix data used in this analysis.

(b) Emission Factors

Emission factors for on-road mobile sources were obtained from EMFAC2017 and CT-EMFAC2017, which were used to estimate emissions from roadways in West Oakland, as well from fleet operating at truck-related businesses and Port Trucks operating within Port terminals.

In the future, brake wear, tire wear and re-entrained road dust emissions will dominate total PM emissions, due to increasingly stringent standards for exhaust emissions (Reid *et al.* 2016). However, uncertainties in the emission factors from these processes is much higher because of their complexity and limited research, as they are currently unregulated processes. The methods used to estimate emission factors are either outdated or based on limited measurements or unreliable assumptions. For example, brake wear emissions factors in EMFAC2017 are assumed to be independent of vehicle travelling speed, despite the fact that there are often more braking events during low speed driving. CARB is sponsoring four studies that are expected to be completed next year to improve the emissions factors for brake and tire wear. While road dust emissions are estimated using AP-42, the empirically-derived equation (see Section 2.3.3(b)) does not take into account vehicle speed, which can affect the emission factor (U.S. Environmental Protection Agency 2011), and does not restrict the maximum emissions by the number of vehicles. Silt loading values are inherently site-specific as they vary by road type and geographic locations. In this analysis, the county-average default values were used since values specific to West Oakland roadways are not available. Uncertainty in road dust emissions is further complicated by the mismatch between roadway classification systems of the data available, where freeway on- and off-ramps were assigned to multiple functional classes and thus numerous CARB road types, which are used to determine the silt loading factor by roadway segment. This likely resulted in a slight overestimate of road dust emissions from these roadway segments.

Of critical importance to West Oakland is the estimation of emissions from Port Trucks, which in part relies on the emission factors. Some field studies have suggested that there are uncertainties in the emission factors for Port Trucks for specific model years; for running exhaust emission factors for model years 2007 to 2009, a ~50% increase in black carbon and ~100% increase in $PM_{2.5}$ between calendar years 2013 and 2015 has been observed, while EMFAC2017 estimates only a ~26% increase in $PM_{2.5}$ (Preble *et al.* 2016). The inconsistency is likely due to the underestimates of high emitters caused by deterioration of Diesel Particle Filters (DPFs) in EMFAC2017. Further drayage truck studies conducted near the Port of Los Angeles exhibited a similar increase in emission factor in 2015, but showed emission factors in 2017 were closer to 2013 levels (Bishop and Haugen 2018). This suggests that the underestimate of emission factors did not continue in 2017. As noted in Bishop and Haugen (2018), a potential explanation for fewer high-emitting vehicles in 2017 is that there was increased roadside compliance testing and issuance of statewide citations since 2015 by CARB; this may have encouraged corrective maintenance or relocation for some of the high-emitting trucks observed in 2015.

To develop a better understanding of how DPF failure rates can affect emission factors of Port Trucks, the District conducted a sensitivity analysis for base year 2017 where EMFAC2017-based emission factors of affected model years were adjusted to reflect the same deteriorations observed by Preble *et al.* (2016). The analysis suggested a < 50% underestimate in Port Truck $PM_{2.5}$ running exhaust emissions, which corresponds to a ~ 1% underestimate in the overall 2017 emissions inventory for West Oakland. For future years 2024 and 2029, there should be no impact as the 2007-2009 model year group will be phased out by January 1, 2023 according to CARB's Truck and Bus Rule.

6.1.3 Truck-Related Businesses

Estimating emissions from truck-related businesses is inherently uncertain since business operations, such as activity patterns and fleet mix, are generally unknown. Truck fleet size estimates were based on responses District surveys (2009 or 2019 when available). When the District did not receive a response, a default truck fleet size and mix were assigned to the business. The District also applied a default truck fleet mix based on the 2009 West Oakland Truck Survey since fleet mix was not reported in the 2019 survey. The number of trucks reflects the trucks owned or operated by the business but excludes other trucks that visit the premises for business purposes.

In previous surveys conducted by the District (Bay Area Air Quality Management District 2009), the District found that all trucks complied with the 5 min idling regulation adopted by CARB (California Air Resources Board 2004). To be conservative, the District intentionally used a higher value of 15 min of idling per truck trip for all businesses. The accuracy of this assumption is unknown; this will certainly cause an over-prediction of air pollutant exposure from this source category, but without a more detailed or recent survey, it is difficult to quantify the uncertainties.

The results of this analysis suggest that truck-related businesses are relatively minor contributors to the overall air pollution and cancer risk in West Oakland. However, the District may consider a more detailed survey in the future to ensure the accuracy of the predictions and include any changes in business operations. The District may also incorporate additional truck-related businesses as information becomes available.

6.1.4 Port-Related Sources

Emissions for Port related activities were taken from the 2017 Port Inventory, prepared by Ramboll (2018). Because the District relied on data provided by the Port, it is difficult to quantify the uncertainties in the emissions estimates. In general, emission inventories have several sources of uncertainties including emission factors, equipment population and age, equipment activity, load factors, and fuel type and quantity. Most uncertainties are associated with the emission factors and engine load factors that were obtained from previous studies, literature reviews, and emission models developed by CARB. To improve the accuracy of the emissions estimates (and reduce uncertainty), the District only used emissions developed using more accurate data on OGV speeds inside the Bay, more realistic OGV emission factors under low load operations, and inclusion of emissions from bunkering that was not quantified in past inventories.

The 2017 Port Inventory, and therefore the emissions inventory presented herein, excludes emissions from smaller emissions sources within the Port, such as TRUs and gasoline powered light-duty vehicles. However, TRUs plug into shore power at the Port (which means they do not run their own engines, thus reducing emissions), and there are few gasoline powered vehicles compared to diesel-powered trucks operated by the Port. Therefore, emissions from these sources are not considered significant, and the overall effect on the Port emissions inventory is minimal.

6.1.5 UP Locomotives and Railyard

Freight activity is not always predictable and annual emissions vary by year depending on regional economics. Although the District used the most accurate emissions available, the District can improve the rail emissions inventory by (1) using Tier-specific emissions factors for locomotives and switchers, (2) including other activities and associated emissions at the railyard, and (3) spatially and temporally allocating activities and emissions along the yard and rail lines.

Using a fuel-based emissions inventory is the preferred method for developing an accurate inventory, as performed for the UP freight locomotives and railyard. The District converted the fuel consumption by rail link provided by UP to emissions using a fuel-based emission factor obtained from EPA, which are based on average operating duty cycles and an estimated average nationwide fleet mix for both switcher and line-haul locomotives. Using locomotive-specific conversion factors would yield better estimate of emissions, as fleet mixes vary from railroad to railroad and can be highly regionalized. And, though the use of Tier-specific emission factors (e.g., as shown in Table 6-1) could be used to improve the emissions inventory, it is also recognized that individual engines and thus emission factors are highly variable within Tier categories, depending on the specific locomotive model, operation cycle, and condition of operation (Bergin *et al.* 2012). In this analysis, it is not known whether the use of nationwide fuel-based emission factors may have resulted in under- or overestimates of emissions, given that detailed information on the locomotive characteristics and activity is not available.

Table 6-1. Fuel-based PM_{10} emission factors for locomotive engines by Tier. Values from California Air Resources Board (2017c).

Tier	PM_{10} (g/gal)
Pre-Tier	6.66
Tier 0	6.66
Tier 0+	4.16
Tier 1	6.66
Tier 1+	4.16
Tier 2	3.74
Tier 2+	1.66
Tier 3	1.66
Tier 4	0.31

Another improvement for future modeling efforts is the inclusion of other sources of emissions at the UP railyard. This analysis focused on emissions from line-haul locomotives and switchers, and excluded other sources of emissions at the railyard due to lack of data. In 2008, CARB completed an HRA for the UP railyard in Oakland that evaluated the health impacts associated with TACs emissions (California Air Resources Board 2008b). According to this report, activities in the railyard include receiving inbound trains, switching rail cars, loading and unloading intermodal trains, storing intermodal containers and truck chassis, assembling outbound trains, releasing outbound trains, and repairing freight cars and intermodal containers/chassis. Specific emission sources associated with these activities include locomotives, on-road diesel-fueled trucks, CHE, TRUs and refrigerated rail cars (reefer cars), and fuel storage tanks. DPM emissions from the UP railyard in 2005 inventory from California Air Resources Board (2008b) and the 2017 fuel-based emissions in this Action Plan are presented in Table 6-2. Although the District's analysis did include the largest sources of emissions primarily from switcher locomotives moving rail cars, line-hauls, and on-road trucks, the analysis did exclude cargo handling equipment and TRUs/reefer cars which contribute 49% of the emissions in the 2005 inventory. For this analysis, UP confirmed that the District modeled the most significant sources of diesel PM at the railyard and that the excluded sources were minor (James Brannon, UP, personal communication, 4 April, 2019). Additionally, at the time of this analysis, emissions from these other sources were not readily available from UP, and it is unknown whether the current activity levels are consistent with operations in 2005. The decline in switcher and line-haul emissions may be an indication that non-modeled sources would likewise experience a decline due to the introduction of new equipment and fleet turnover, resulting in lower emissions.

Table 6-2. UP railyard DPM emissions (tpy) in 2005, from California Air Resources Board (2008), and 2017, based on the West Oakland Action Plan (this document). The percent change from 2005 to 2017. The 2017 emissions from freight haul lines includes emissions from both UP and BNSF locomotives. “n/a” indicates that the source category was not included in the 2017 emissions inventory for UP operations.

Source Category	2005	% total	2017	% total	% change
Locomotives					
Haul lines (freight)	1.6	14	0.5044	30	-68.5
Switchers (railyard)	1.9	17	1.1098	67	-41.6
Service/testing	0.5	4	n/a	–	–
TRUs, reefers	3.2	28	n/a	–	–
CHE	2.2	19	n/a	–	–
On-road trucks	1.9	17	0.0416	3	-97.8
Total	**11.3**	**100**	**1.6558**	**100**	

The last improvement is the spatial and temporal allocation of emissions at specific railyard source locations. At the time the modeling was completed, information regarding locations of specific sources was not known. Instead, switcher engines and on-road trucks emissions were allocated on to an area that encompassed all of the rail lines, intermodal gates, locomotive service, and main yard. In subsequent discussions with UP, they confirmed that individual source locations identified in the 2008 CARB report were valid for 2017 operations (Gary Rubenstein, personal communication, 5 April, 2019; see Figure 6-1). The modeling assumed constant activity throughout the year but adjustments can be made in the modeling to account for temporal variations in activity level by season, time of day, or weekly.

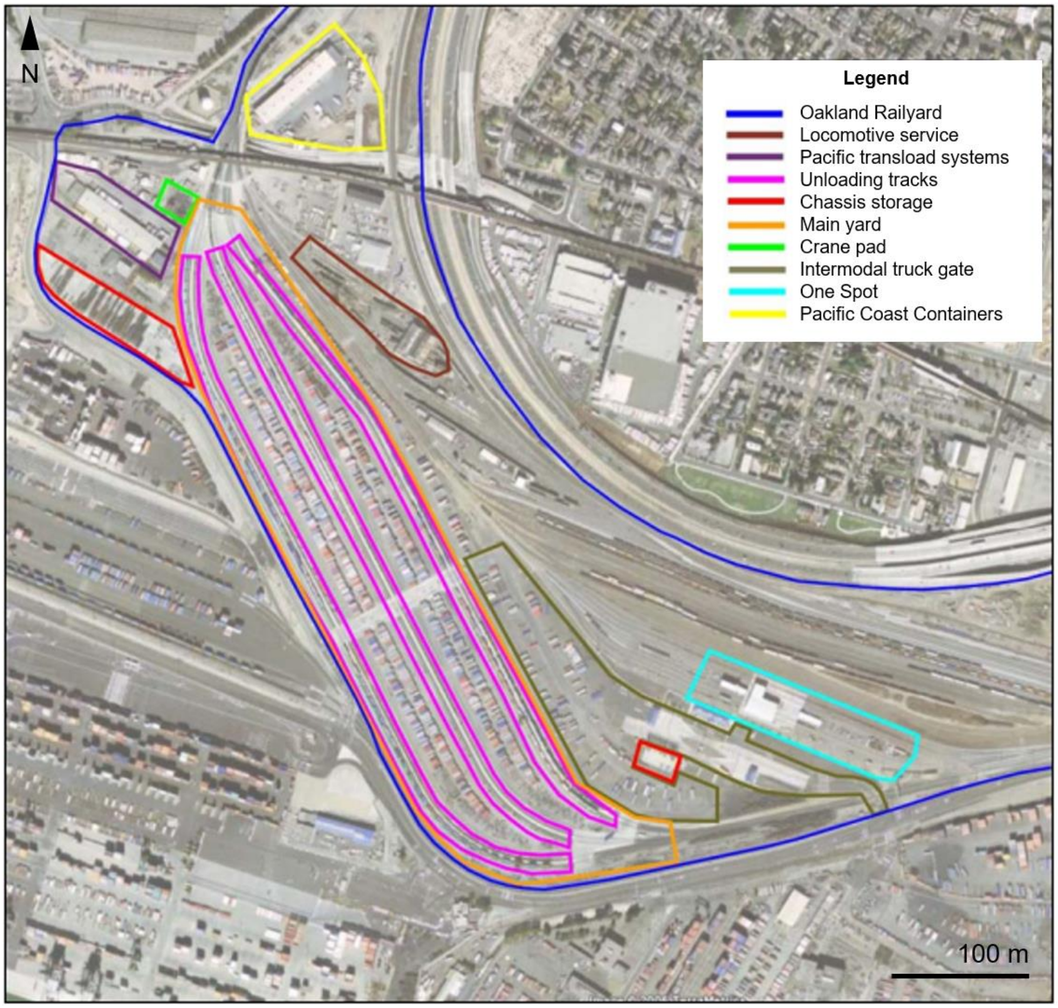


Figure 6-1. Layout of operations at the UP railyard in West Oakland. The components delineated represent different emissions sources (obtained from Gary Rubenstein, personal communication, 5 April, 2019).

UP is in the process of developing a detailed, comprehensive emissions inventory for the Oakland railyard which is expected to be completed by the end of 2019. UP expects to capture individual locomotive characteristics and movements to develop a bottom-up inventory of sources and emissions in the railyard. The District plans to use this detailed inventory in future UP emissions estimates that will address most of the uncertainties identified in this analysis.

6.1.6 Omitted Emissions Sources

Emissions from other sources that were not included in the community-scale inventory and modeling were estimated using a top-down approach, as reported in Table 2-3. Further refinements to the emissions estimates of these source categories, in addition to their temporal and spatial allocation, would further improve the estimates of community exposure in West Oakland.

(a) Commercial Cooking

Commercial cooking emissions for West Oakland were estimated by disaggregating the District's emissions estimates for Alameda County by using spatial surrogate data developed for the regional modeling. The spatial surrogate for commercial cooking was based on the fraction of Alameda County restaurants that fall within the West Oakland community-scale Source Domain. Approximately 10% of Alameda County restaurants fall within the West Oakland domain, resulting in 20.63 tpy of $PM_{2.5}$ emission in 2017.

To start to refine the District's understanding of commercial cooking emissions at a community-scale in West Oakland, specific restaurant locations were identified from a database purchased from InfoUSA.[77] There are 537 restaurants within the West Oakland Source Domain, where most of the facilities are in Chinatown (south of Downtown), southwest of the West Oakland community (Figure 6-2). In fact, only 74 of the restaurants fall within the main residential area of West Oakland, some of which may not use cooking devices that emit $PM_{2.5}$ (e.g., charbroilers, deep fat fryers, or griddles). Additional analyses are underway to evaluate the potential impact of commercial cooking in West Oakland, especially given that the majority of commercial cooking facilities are generally downwind of the West Oakland community.

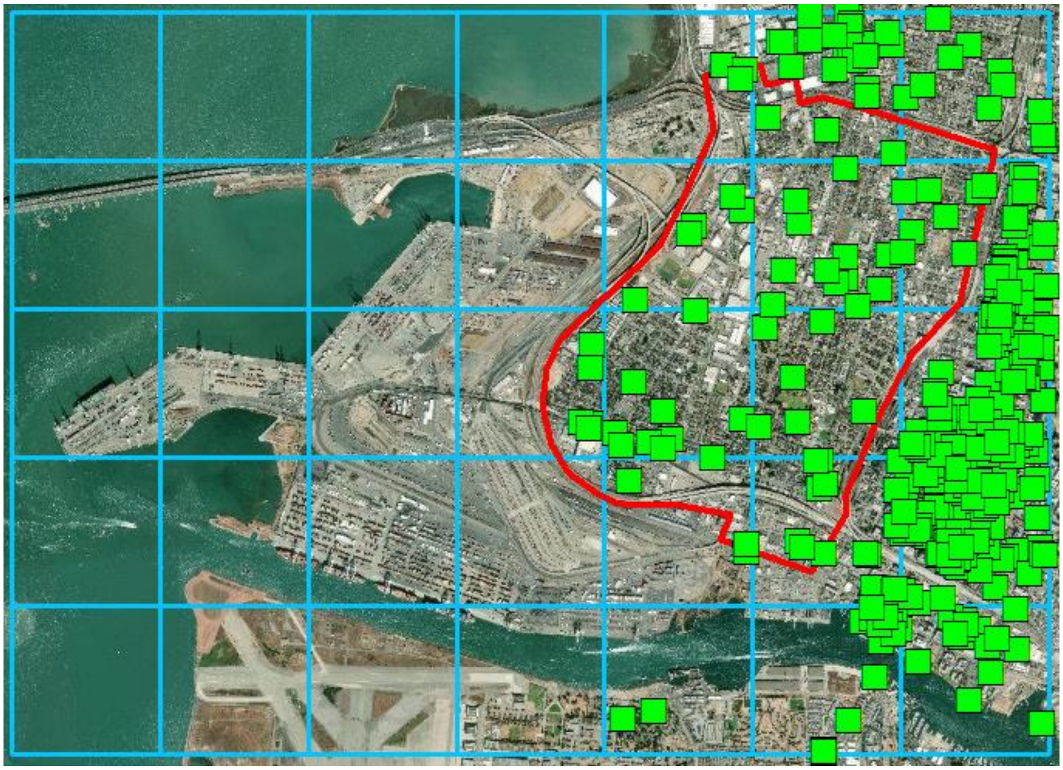


Figure 6-2. Restaurant locations (green squares) within the West Oakland Source Domain (blue grid). The major residential area of the West Oakland community is outlined (red line).

[77] https://www.infousa.com/

(b) Construction

Emissions from construction equipment and construction dust for West Oakland were estimated by disaggregating CARB's emissions estimates for Alameda County using spatial surrogate data developed for the regional modeling. Alameda County emissions data were obtained from CARB's 2016 SIP Emissions Projections Tool,[78] and the spatial surrogate was developed based on land use data from the Association of Bay Area Governments (ABAG). Specifically, ABAG's Existing Land Use Data for 2000 and 2005 were compared to identify land use changes and determine where construction activity likely occurred. This approach leads to high uncertainty in emission estimates for 2017, as construction activity is highly transient, changing in scope and location from year to year. Construction emissions were not included in the community-scale modeling for West Oakland due to uncertainties associated with 2017 emission estimates and the spatial distribution of construction activities in the community. ABAG has not updated the Existing Land Use Data since 2005, and the District is currently exploring other sources of information for recent and projected construction activity in West Oakland.

(c) Transportation Refrigeration Units (TRUs)

Emissions from TRUs were estimated at the county-level using CARB's OFFROAD model. The District disaggregated Alameda County TRU emissions to West Oakland using an industrial land use spatial surrogate which was derived from ABAG's 2005 Existing Land Use Data. Based on this surrogate, ~4% of Alameda County TRU emissions occur in West Oakland.

CARB has also provided the District with estimates for TRU emissions in West Oakland. CARB allocated a portion of Alameda County emissions to West Oakland using a spatial surrogate based on facilities that operate TRUs or are frequented by TRUs.[79] Such facilities include grocery stores, liquor stores, cold storage warehouses, and trans-load facilities. Approximately 80% of West Oakland emissions were classified by CARB as large (> 200,000 ft^2) and medium (50,000 – 200,000 ft^2) sized facilities. The remaining 20% of TRU emissions were allocated to operation on roadways within West Oakland.

The District's TRU emissions estimate for West Oakland are about half of CARB's estimate (Table 6-3). The District plans to investigate this further by contacting the 10 large- and medium-sized facilities in West Oakland identified by CARB to obtain more information regarding their TRU activity. TRU emissions may then be refined and/or included in future community-scale modeling.

Table 6-3. 2017 TRU emissions for Alameda County and West Oakland.

Estimated by	Area	$PM_{2.5}$ (tpy)	DPM (tpy)
CARB	Alameda County	6.57	7.30
	West Oakland	0.49	0.53
District	West Oakland	0.24	0.26

[78] https://www.arb.ca.gov/app/emsinv/2016ozsip/2016ozsip/.

[79] As documented in a memo, *Spatial Allocation Methodology of Transportation Refrigeration Unit (TRU) Emissions for AB617 Communities*, provided to the District by CARB on May 30, 2019.

(d) Residential Wood Combustion

The District developed a top-down emission inventory for residential fuel combustion in West Oakland by disaggregating county-level emissions estimates using the proportion of primary heating fuel used by households assigned to wood combustion from the 2010 Census data. This approach results in uncertainties for wood combustion emissions, as some homes may burn wood in fireplaces recreationally, but not report wood as the primary heating fuel.

Past residential wood combustion surveys conducted by the District did not include homes in West Oakland. In addition, community members have reported backyard burning that may not be reflected in the District's residential wood combustion emissions estimates. Due to these uncertainties, and especially given the lack of spatial information, this source category warrants further investigation and was not included in community-scale modeling efforts.

6.2 Air Dispersion Modeling

While AERMOD is a state-of-the-art dispersion model for near-field applications, there are still inherent uncertainties associated with the model calculations.

6.2.1 Model Formulation

Generally, a model is a (often) simplified representation of a real-world system, where complex processes are parameterized and characterized using equations that are solved by a computer. Some uncertainties in the results are inherent to a model itself, and thus may be referred to as "irreducible" errors or uncertainties. The District used the AERMOD dispersion model to estimate the dispersion factors and consequently pollutant concentrations in West Oakland to which the population could be exposed. AERMOD uses simplified atmospheric physics and scaling concepts to simulate air pollutant dispersion. Some uncertainties in the results arise from the model's inability to represent the complex aerodynamic and dispersion processes.

Specifically, AERMOD is a steady-state plume model; this means that only a single set of temporally averaged (usually 1 h) meteorological parameters are used to represent the atmospheric state over the averaging time at any point in space, i.e., meteorological conditions are spatially homogeneous. This can potentially be problematic in coastal areas or in areas of complex terrain, where wind fields can have high spatiotemporal variability. Given the proximity and orientation of the Bay surrounding the West Oakland community, only using a single meteorological dataset introduces uncertainties to the potential dispersion of pollutants. Wind directions from the meteorological dataset from OST, located to the northwest of the modeling domain, used in AERMOD were predominantly from the northwest (Figure 3-2). These winds influence the dispersion from emissions sources at any location within the domain, though winds likely have a more southerly component at locations along the channel and Inner Harbor. As a result, dispersion to locations in the northeastern section of the domain may be slightly underestimated. And, while AERMOD uses a dividing-streamline concept to model dispersion of plumes around topographic features (Cimorelli *et al.* 2004, Snyder *et al.* 1985), the inherent uncertainties in this formulation are likely less important for dispersion modeling in West Oakland, as the area is relatively flat (Figure 3-19).

AERMOD also does not account for small-scale flow patterns and dispersion around structures or recirculation and channeling in urban canyons, as is typical in urban areas with multi-story buildings. While AERMOD can include some of the influence of building wakes on plume rise and dispersion (using the Plume Rise Model Enhancements [PRIME] model downwash algorithm [Schulman *et al.* 2000]), this calculation feature can only be used for point sources (Cimorelli *et al.* 2004); most of the emissions sources in this analysis were modeled as area and volume sources.

The performance of the AERMOD modeling system has been evaluated against several observational datasets (Perry *et al.* 2005); the accuracy of the output depends on the pollutant, type of source modeled, terrain (flat or complex), whether or not wake effects are accounted for, and the averaging period of results compared to observations (e.g., 3 h, 24 h). AERMOD tends to perform well, especially in reproducing the highest concentrations of pollutant distributions (Perry *et al.* 2005), which are often used to assess compliance with air quality regulations (e.g., National Ambient Air Quality Standards [NAAQS]) or investigate “worst-case scenarios.” However, if there are additional “reducible” uncertainties associated with input data (e.g., wind direction), “composite errors in the highest estimated concentrations of 10 to 40 percent are found to be typical,” (U.S. Environmental Protection Agency 2017, paragraph 4.1(e)). AERMOD may also underestimate lower concentrations, which can namely impact annual average estimates (Perry *et al.* 2005). While the overall distribution of pollutant concentrations may be well captured by AERMOD, the exact time and location of the concentrations may be less certain (Cimorelli *et al.* 2004, Perry *et al.* 2005), especially given the steady-state formulation.

That being said, AERMOD is currently the preferred model for near-field (≤ 50 km) dispersion of emissions, as listed in EPA’s Guideline on Air Quality Models (“Appendix W” to 40 CFR Part 51; U.S. Environmental Protection Agency 2017). AERMOD is routinely used in research and regulator frameworks, performs better than similar models (e.g., Perry *et al.* 2005), and has been applied to estimate pollutant concentrations in similar studies (e.g., California Air Resources Board 2008b). The District has evaluated and used an appropriate meteorological dataset such that “reducible” uncertainties are limited (see Section 3.2.1). As future modeling efforts are implemented, the District will ensure that the latest versions of each model in the AERMOD modeling framework are used to reduce some of the inherent uncertainty.

6.2.2 Dispersion Modeling and Emissions Source Parameters

The selection dispersion modeling and emissions source parameters use for AERMOD dispersion modeling also introduce limitations and uncertainties to the results. Some of these are discussed below:

- **Urban surface roughness length**: All sources were modeled as urban sources with a surface roughness length set to 1.0 m. While this is the default value for regulatory applications in AERMOD (U.S. Environmental Protection Agency 2018b), and is considered appropriate for most applications (U.S. Environmental Protection Agency 2015a) as it is representative of centers of large towns and cities or landscapes with regularly-spaced large elements, a more representative value could be derived and used West Oakland. Though, the default value was used in this analysis to be consistent with other permit modeling performed by the District.

- **Building downwash**: The effects of building downwash were not accounted for. The building downwash option in AERMOD, using the PRIME algorithm, accounts for the buildup of air pollution in a building's cavity due to recirculating winds created by nearby buildings; the effects are governed by the building geometry and the wind direction. Typically, building downwash leads to higher concentrations downwind of the (stack) emission source. Parameters required to use this feature include the building height and dimensions; for West Oakland, these parameters could be derived from the lidar dataset used (Section 3.4.3(b)) or similar dataset. However, the building downwash algorithms can only be applied to point sources; they do not apply to volume or area sources, which were the primary source types used in this analysis. The District did not apply building downwash to point sources for consistency.

- **AERMOD source type selection**: Source types must be selected by the modeler to represent the physical geometry and emission characteristics of emission sources. In AERMOD, these are generally point, area, or volume sources. While the District selected source types based on general modeling guidance, previous studies, and/or engineering judgements, some AERMOD source types may not adequately capture the emissions characteristics of certain sources, while the District did not have necessary configuration information for others (e.g., see the discussion below for permitted stationary sources).

- **Missing parameters**: When modeling parameters were not known, the District used default model values or values based on general modeling guidance, previous studies, and/or engineering judgements. Modeling parameters were often selected so that the modeling would produce more conservative results.

While there are uncertainties related to dispersion modeling parameters used for all emissions source categories, those that could be improved upon in future modeling analyses are discussed below:

Permitted Stationary Sources: Only a limited number of facilities had complete release parameter information (Table 2-5). Missing parameters, such as stack height and diameter, were assigned "default" values (Table 3-2), which were based on previous modeling studies conducted by the District. Moreover, in spite of significant effort expended to improve the exact location of stacks and emission sources at permitted facilities, errors and uncertainties persist due to the complex arrangement of the facilities. The District also had to use either a single volume source or point source for each permitted stationary source; however, the District recognizes that some sources, particularly fugitives, tanks, and waste piles, may be more accurately modeled as area sources. In future modeling analyses, the District may seek to remove this restriction and include more site-specific emissions release parameters, where available.

On-road mobile sources: The main uncertainties in the modeling parameters for on-road mobile sources is related the source (roadway) width (W), and the release heights ($Relhgt$) assigned to each volume source. First, the width determines the initial horizontal dispersion coefficient ($Syinit$), the size of the exclusion zone (r_{EZ}), and therefore which receptors from the "master grid" must be excluded (Section 3.4.1, 3.5) and where dispersion factors must be imputed (Section 4.1.1). In this analysis, the roadway width was based on road type class (originally based on the Citilabs dataset) and FHWA guidance. The highest degree of uncertainty likely applies to on- and off-ramps, since they were distributed among multiple road type classes. Second, since current EPA guidance (U.S. Environmental Protection Agency 2015b) does not include recommendations on how to model on-road mobile source emissions on elevation roadways in AERMOD, the District adjusted the release heights to account for the elevation of roadways. The structure elevation data was based on a lidar dataset (Section 3.4.3(b)). The resulting structure heights appeared to be overestimated (and "noisy," with a higher degree of spatial variability than expected) on surface streets (Figure 3-5), where it is assumed that roadways are generally at grade. An improvement or further assumption could be that structure elevation data should only be assigned to freeways and on- and off-ramps, since they are the largest source of on-road mobile source emissions, and are most likely to be above grade. This would require further refinement of the road type classes assigned to each roadway segment. Otherwise, an alternative dataset could be used, such as the Caltrans automated pavement condition survey (APCS).[80] This dataset contains the start and end elevations of roadway segments for freeways in California. As such, the elevation along each segment could be interpolated to volume source locations. However, since the primary purpose of the APCS data is to assess pavement conditions, the data is not necessarily well calibrated. Using the dataset would also require more refined geospatial processing techniques to properly match segments from the APCS shapefile to those in the Citilabs dataset. The APCS dataset also does not include all elevated roads and on- and off-ramps in West Oakland. In summary, both the width and release heights of the volume sources used to model emissions form on-road mobile sources could be improved with further refinement of road type classification, especially for on- and off-ramps.

Since there can be discrepancies between real-world emissions characteristics from a source and how they are represented in AERMOD, exposure concentrations derived in this analysis should be taken to represent approximate exposure concentrations.

6.2.3 Receptors

Receptors were placed at a height of 1.8 m agl; this parameter is used to conservatively model exposures within an individual's "breathing zone." Using the flagpole receptors may not always capture the highest predicted concentration, especially in cases where both the source and the receptors are elevated above the surface terrain. Concentrations estimated at receptors also only represent those that an individual may be exposed to outdoors (indoor air quality and exposure is not assessed).

[80] Currently, the most recent dataset is the 2016 Elevation APCS dataset ("Elevation2016APCS", created July 27, 2016, by the Caltrans Office of Pavement Management and Performance; available at: http://www.dot.ca.gov/hq/tsip/gis/datalibrary/Metadata/Elevation.html).

6.3 Risk Assessment Methodology

A risk assessment is a decision-making tool that can be used to estimate the probability of adverse health effects in humans exposed to pollutants in the environment. Risk assessment methodology uses an estimated level of contamination in the environment (concentration) while assuming a constant rate of intake and length of exposure, combined with chemical effect factors, to produce cancer risks. While mean parameters values derived from scientifically defensible studies are a reasonable estimate of central tendency, the exposure variables used in this assessment are only estimates. Therefore, that is to say, the resulting cancer risk estimated in this analysis is not the expected rate of illness in West Oakland, but is rather an estimate of potential risk that can be used to compared to risk from other sources or in communities if using a similar methodology.

Risk assessments are designed to be overly conservative to ensure that the probability, expressed as the chance of developing cancer for one million people that are exposed at a specific location, are health protective of the most sensitive population. EPA notes that the conservative assumptions used in a risk assessment are intended to assure that the estimated risks do not underestimate the actual risks posed by an emissions source, and that the estimated risks do not necessarily represent actual risks experienced by populations at or near a source (Environmental Protection Agency 1989). The methodology and parameters used in risk assessments have long been established and are accepted practice for comparing exposure and health impacts between sources. The main assumptions within the risk assessment methodology (based on OEHHA's guidance) are:

(1) Ambient pollutant concentrations (estimated from dispersion modeling in this analysis) are constant over the exposure period (30 years), while in reality, average pollutant concentrations vary on many time scales, including daily, seasonally, and inter-annually.
(2) An individual is exposed *in vitro* starting from the last trimester of pregnancy and continues to reside at the same location into adulthood and only nominally absent from the location of exposure.
(3) Some chemical toxicity values are estimated based on *in vivo* studies using animals that are extrapolated to estimate effects on humans. High chemical doses administered to these animals are often much higher than what human are exposed to in the environment.

All of these factors are designed to overestimate exposure, cancer risk, and health effects to humans. Thus, while resulting in conservative cancer risk estimates, each assumption contributes to inherent uncertainties in the results. Further uncertainties lie within the variability of in emissions from different emissions sources (which result in fluctuations of pollutant concentrations over time), changes in daily human activity patterns and therefore location of exposure (i.e., not always at the place of residence), and range of individual responses to chemical exposures (which could depend on genetics, immune system response, metabolism, etc.).

ASF values, as recommended by OEHHA, increase the effective CPF to account for increased sensitivity of younger individuals to cancer-causing pollutants. However, there may be pollutants in the urban environment whose cancer toxicity is amplified due to the presence of other pollutants (synergic effects) or because of pre-existing conditions or sensitivities; these effects are not accounted for. Furthermore, there may be pollutants whose toxicity is not yet recognized or quantified and, as such, is unaccounted for in this analysis.

While the District used CPF values recommended by OEHHA to estimate cancer risk associated with pollutant exposures from the modeled emissions sources, these values are uncertain in both the estimation of response and dose for many pollutants. For example, the level of risk for DPM is uncertain; public health and regulatory organizations, such as the International Agency for Research on Cancer (IARC), World Health Organization (WHO), and EPA, agree that diesel exhaust may cause cancer in humans, though there is uncertainty in the CPF value (see Scientific Review Panel 1998, Office of Environmental Health Hazard Assessment 2011). As such, any adopted changes to CPFs or exposure factors will be incorporated in future risk assessments for West Oakland.

7. References

American Association of State Highway and Transportation Officials. (2018). A policy on geometric design of highways and streets, 7th edition. Washington, D. C.: American Association of State Highway and Transportation Officials.

Bay Area Air Quality Management District. (2009). West Oakland Truck Survey. December. http://www.baaqmd.gov/~/media/files/planning-and-research/care-program/final-west-oakland-truck-survey-report-dec-2009.pdf

Bay Area Air Quality Management District. (2012). Understanding particulate matter: Protecting public health in the San Francisco Bay Area. Draft August 2012. Available at: http://www.baaqmd.gov/~/media/files/planning-and-research/plans/pm-planning/understandingpm_draft_aug-23.pdf

Bay Area Air Quality Management District. (2014). Identifying areas with cumulative impacts from air pollution in the San Francisco Bay Area, Version 2. Prepared by Martien, P., Fairley, D., Lau, V., Tanrikulu, S., Riviere, C., Hilken, H. Available at: http://www.baaqmd.gov/~/media/Files/Planning%20and%20Research/CARE%20Program/Documents/ImpactCommunities_2_Methodology

Bay Area Air Quality Management District. (2017). California Environmental Quality Act – Air Quality Guidelines. May 2017. Available at: http://www.baaqmd.gov/~/media/files/planning-and-research/ceqa/ceqa_guidelines_may2017-pdf.pdf?la=en. Accessed February 2019.

Bergin, M., Harrell, M., Janssen, M. (2012). Locomotive Emission Inventories for the United States from ERTAC Rail. 2012 International Emissions Inventory Conference, Tampa, Florida, August 13–16, 2012. Available at: https://www3.epa.gov/ttnchie1/conference/ei20/session8/mbergin.pdf.

Biondi, E. (2016). Information: Updated interim guidance on mobile source air toxic analysis in NEPA documents. Memorandum by Office of Natural Environment, U.S. Federal Highway Administration, NEPN-10, October 18. Available at https://www.fhwa.dot.gov/environMent/air_quality/air_toxics/policy_and_guidance/msat/2016msat.pdf.

Bishop, G. A., Haugen, M. J. (2018). Investigate the durability of diesel engine emission controls. Prepared for California Air Resources Board and the California Environmental Protection Agency, 11-309. March 2018, 150 pages. Available at: https://ww3.arb.ca.gov/research/apr/past/11-309.pdf.

Boylan, J. W., Russell, A. G. (2006). PM and light extinction model performance metrics, goals, and criteria for three-dimensional air quality models. *Atmospheric Environment*, 40, 4946-4959, doi:10.1016/j.atmosenv.2005.09.087.

California Air Resources Board. (2004). Airborne toxic control measure to limit diesel-fueled commercial motor vehicle idling. Available at: https://www.arb.ca.gov/regact/idling/fro1.pdf

California Air Resources Board. (2005a). Initial statement of reasons for proposed rulemaking for the regulation of mobile cargo handling equipment at ports and intermodal rail yards, Appendix B: Emission inventory methodology for cargo handling equipment operating at ports and intermodal rail yards in California. Available at: https://www.arb.ca.gov/regact/cargo2005/appb.pdf

California Air Resources Board. (2005b). Particulate emissions reduction program at California rail yards, Execution Copy. Available at: https://www.arb.ca.gov/railyard/ryagreement/083005mouexecuted.pdf

California Air Resources Board. (2006). ARB rail yard emissions inventory methodology. Available at: https://www.arb.ca.gov/railyard/hra/1107ei_guideline.pdf

California Air Resources Board. (2008a). Diesel particulate matter health risk assessment for the West Oakland community. Prepared by Pingkuan, D., Suer, C., Soriano, B., Dolney, N., Wang, C., Harris, G., Houghton, M., Alexis, A., Du, S., Alvarado, A. December. Available at: https://www.arb.ca.gov/ch/communities/ra/westoakland/documents/westoaklandreport.pdf

California Air Resources Board. (2008b). Health risk assessment for the Union Pacific Railroad Oakland Railyard. Prepared by the Stationary Source Division. April 22, 2008. Available at: https://www.arb.ca.gov/railyard/hra/up_oak_hra.pdf?_ga=2.16138166.1070104489.1555696841-271831573.1549999991

California Air Resources Board. (2011a). Commercial harbor craft emissions inventory. Available at: https://www.arb.ca.gov/msei/ordiesel.htm

California Air Resources Board. (2011b). Drayage Truck Regulation. Available at: https://www.arb.ca.gov/msprog/onroad/porttruck/finalregdrayage.pdf

California Air Resources Board. (2011c). Initial statement of reasons for proposed rulemaking - Proposed amendments to the regulations "Fuel sulfur and other operational requirements for ocean-going vessels within California waters and 24 nautical miles of the California baseline", Appendix D: Emissions estimation methodology for ocean-going vessels. Amended 2014. Prepared by the Planning and Technical Support Division. Available at: https://www.arb.ca.gov/regact/2011/ogv11/ogv11appd.pdf

California Air Resources Board. (2011d). Initial statement of reasons for proposed rulemaking for the amendment to the regulation for mobile cargo handling equipment at ports and intermodal rail yards, Appendix B: Emissions inventory methodology. Available at: https://www.arb.ca.gov/regact/2011/cargo11/cargoappb.pdf

California Air Resources Board. (2012a). Cargo Handling Equipment Inventory model. Available from: http://www.arb.ca.gov/ports/cargo/cheamd2011.htm

California Air Resources Board. (2012b). Commercial Harbor Craft Emissions model, Appendix B: Emissions estimation methodology for commercial harbor craft operating in California. Available at: https://ww3.arb.ca.gov/msei/chc-appendix-b-emission-estimates-ver02-27-2012.pdf

California Air Resources Board. (2013). PM_{10} size fractions referenced to $PM_{2.5}$. Developed under the Automated Methods to Find the Cost-Effectiveness of Funding Air Quality Projects database tools. Available at: https://www.arb.ca.gov/planning/tsaq/eval/pmtables.pdf

California Air Resources Board. (2014a). Marine Emissions Model v2.3L, March 2014. Available from: https://ww3.arb.ca.gov/msei/ordiesel.htm

California Air Resources Board. (2014b). 2014 Updates to the CARB OGV Model. Available from: https://ww3.arb.ca.gov/msei/ordiesel.htm

California Air Resources Board. (2015). EMFAC2014 volume III - Technical Documentation v1.0.7. March. Available at: https://ww3.arb.ca.gov/msei/downloads/emfac2014/emfac2014-vol3-technical-documentation-052015.pdf

California Air Resources Board. (2016). Miscellaneous process methodology 7.9. November. Available at https://www.arb.ca.gov/ei/areasrc/fullpdf/full7-9_2016.pdf

California Air Resources Board. (2017a). EMFAC2017: Handbook for project-level analyses, v1.0.1. December 22. Available at https://www.arb.ca.gov/msei/downloads/emfac2017_pl_handbook.pdf

California Air Resources Board. (2017b). EMFAC2017 user's guide, v1.0.1. December 22. Available at https://www.arb.ca.gov/msei/downloads/emfac2017_users_guide_final.pdf

California Air Resources Board. (2017c). 2016 Line Haul Locomotive Model and update. Technical Appendix. Prepared by the Off Road Diesel Analysis Section. October 2017.

California Department of Transportation. (2019). CT-EMFAC2017. Prepared by Bai, S., Seagram, A., Churchman, L., Parajon, G., Ekstrand, A., Du, Y., West, J., report CTAQ-RT-19-368.02.07. Available from: http://www.dot.ca.gov/env/air/ctemfac-license.html

California Environmental Protection Agency. (2014). Proposed regulatory amendments extending the California standards for motor vehicle diesel fuel to diesel fuel used in harborcraft and intrastate locomotives. Prepared by the California Environmental Protection Agency, Air Resources Board, Stationary Source Division, October 1, 2014. Available at: https://www.arb.ca.gov/regact/carblohc/isor.pdf

Cimorelli, A. J., Perry, S. G., Venkatram, A., Weil, J. C., Paine, R. J., Wilson, R. B., Lee, R. F., Peters, W. D., Brode, R. W., Paumier, J. O. (2004). AERMOD: Description of model formulation. Prepared for the U.S. Environmental Protection Agency, Office of Air Quality Planning and Standards, Emissions Monitoring and Analysis Division, Research Triangle Park (NC), EPA-454/R-03-004. 91 pages. Available at: https://www3.epa.gov/scram001/7thconf/aermod/aermod_mfd.pdf

Cohen, A. J., Pope, C. A. (1995). Lunch cancer and air pollution. Environmental Health Perspectives, 103 (Suppl 8), 219-224. doi: https://doi.org/10.1289/ehp.95103s8219

Desser, C. (2014). PM hot-spot modeling: Lessons learned in the field. Workshop presentation. Transportation Research Board, 12 January 2014, Washington, D.C.

Emery, C., Liu, Z., Russell, A. G., Odman, M. T., Yarwood, G., Kumar, N. (2017). Recommendations on statistics and benchmarks to assess photochemical model performance. *Journal of the Air and Waste Management Association*, 67 (5), 582-598, doi:10.1080/10962247.2016.1265027.

Environ International Corporation (2008) Revised Port of Oakland 2005 Seaport Air Emissions Inventory. Prepared for the Port of Oakland, March 14, 2008. Available at: https://www.portofoakland.com/files/pdf/environment/airEmissions_Inventory.pdf. Accessed January 2019.

Harley, R. A., Preble, C. V., Dallmann, T., Kirchstetter, T. W., Kreisberg, N. M., Hering, S. V. (2014). On-road measurement of emissions from heavy-duty diesel trucks: Impact of fleet turnover and ARB's Drayage Truck Regulation. Final Report. Prepared for the California Air Resources Board, 09-340. 69 pages. Available at: https://ww3.arb.ca.gov/research/apr/past/09-340.pdf

Health Effects Institute. (2010). Traffic-related air pollution: A critical review of the literature on emissions, exposure, and health effects. HEI Special Report 17. HEI Panel on the Health Effects of Traffic-Related Air Pollution, Health Effects Institute, Boston (MA), 386 pages.

Houyoux, M. R., Vukovich, J. M. (1999). Updates to the Sparse Matrix Operator Kernel Emissions (SMOKE) modeling system and integration with Models-3. The Emissions Inventory: Regional Strategies for the Future, 1461.

Krewski, D., Jerrett, M., Burnett, R. T., Ma., R., Hughes, E., Shi, Y., Turner, M. C., Pope, C. A., Thurston, G., Calle, E. E., Thun, M. J. (2009). Extended follow-up and spatial analysis of the American Cancer Society study linking particulate air pollution and mortality. Research Report 140. Health Effects Institute, Boston (MA), 136 pages.

Marshall, J. D., Teoh, S.-K., Nazaroff, W. W. (2005) Intake fraction of nonreactive vehicle emissions in US urban areas. *Atmospheric Environment*, 39, 7, 1363-1371.

Office of Environmental Health Hazard Assessment. (2012). Hot spots unit risk and cancer potency values. Office of Environmental Health Hazard Assessment, California Environmental Protection Agency. Available at: https://oehha.ca.gov/media/CPFs042909.pdf.

Office of Environmental Health Hazard Assessment. (2015). Air Toxics Hot Spots Program Guidance Manual for the Preparation of Health Risk Assessments 2015. Prepared by Air, Community, and Environmental Research Branch, Office of Environmental Health Hazard Assessment, California Environmental Protection Agency. Available at: http://oehha.ca.gov/air/crnr/notice-adoption-air-toxics-hot-spots-program-guidance-manual-preparation-health-risk-0

Perry, S. G., Cimorelli, A. J., Paine, R. J., Brode, R. W., Weil, J. C., Venkatram, A., Wilson, R. B., Lee, R. F., Peters, W. D. (2005). AERMOD: A dispersion model for industrial source applications. Part II: Model performance against 17 field study databases. *Journal of Applied Meteorology*, 44, 694–708. doi.org/10.1175/JAM2228.1

Preble, C. V., Harley, R. A., Kirchstetter, T. W. (2016). Effects of exhaust after-treatment and fleet modernization on Port of Oakland truck emissions following complete implementation of California's Drayage Truck Regulation. Prepared for California Air Resources Board and Bay Area Air Quality Management District, CARB 14-358, BAAQMD 2015.121. November 2016, 52 pages. Available at: https://ww3.arb.ca.gov/research/apr/past/14-358.pdf.

Ramboll. (2018). Port of Oakland 2017 Seaport Air Emissions Inventory, Final Report. Prepared by Chris Lindhjem, John Grant, and Till Stoeckenius for the Port of Oakland, August, 2018. Available at: https://www.portofoakland.com/files/PDF/Port_Oakland_2017_Emissions_Inventory.pdf

Reid, S., Bai, S., Du, Y., Craig, K., Erdakos, G., Baringer, L., Eisinger, D., McCarthy, M., Landsberg, K. (2016). Emissions modeling with MOVES and EMFAC to assess the potential for a transportation project to create particulate matter hot spots. Transportation Research Record: *Journal of the Transportation Research Board*, 2570, 12-20, doi: 10.3141/2570-02 (STI-6330).

Schulman, L. L., Strimaitis, D. G., Scire, J. S. (2000). Development and evaluation of the PRIME plume rise and building downwash model. *Journal of the Air and Waste Management Association*, 50, 378–390.

Scientific Review Panel. (1998). Findings of the Scientific Review Panel on the report on diesel exhaust. Prepared by J. R. Froines, University of California, Los Angeles, for J. D. Dunlap III, California Air Resources Board. May 27, 1988. Available at: https://www.arb.ca.gov/srp/findings/4-22-98.pdf.

Skamarock, W. C., Klemp, J. B., Dudhia, J., Gill, D. O., Barker, D., M., Duda, M. G., Huang, X.-Y., Wang, W., Powers, J. G. (2008). A description of the Advanced Research WRF Version 3. NCAR/TN-475+STR. Technical Report. Boulder, Colorado, USA: National Center for Atmospheric Research: Mesoscale and Micrometeorology Division, 113 pages.

Snyder, W. H., Thompson, R. S., Eskridge, R. E., Lawson, R. E., Castro, I. P., Lee, J. T., Hunt, J. C. R., Ogawa, Y. (1985). The structure of the strongly stratified flow over hills: Dividing streamline concept. *Journal of Fluid Mechanics*, 152, 249–288.

Sonoma Technology, Inc. (2011). Default modeling parameters for stationary sources. STI-9100044. April 1, 2011.

Starcrest Consulting Group, LLC. (2018). Inventory of air emissions for calendar year 2017. Prepared for the Port of Los Angeles. Technical Report. APP# 171019-517 A. Available at: https://kentico.portoflosangeles.org/getmedia/880bc597-84bc-4ae6-94e2-59a2e6027f42/2017_Air_Emissions_Inventory

Tanrikulu, S., Reid, S., Koo, B., Jia, Y., Cordova, J., Matsuoka, J., and Fang, Y. (2019a). Fine particulate matter data analysis and regional modeling in the San Francisco Bay Area to support AB617. Bay Area Air Quality Management District, San Francisco (CA), January 2019.

Tanrikulu, S., Koo, B., Reid, S., Fang, Y., Jia, Y., Cordova, J., and Matsuoka, J. (2019b). Air toxics data analysis and regional modeling in the San Francisco Bay Area to support AB617. Bay Area Air Quality Management District, San Francisco (CA), March 2019.

U.S. Environmental Protection Agency. (1989). Risk assessment guidance for Superfund Volume I Human health evaluation manual (Part A). Interim Final. Prepared by the Office of Emergency and Remedial Response. EPA/540/1-89/002. December. Available at: https://www.epa.gov/sites/production/files/2015-09/documents/rags_a.pdf.

U.S. Environmental Protection Agency. (1997). Emission factors for locomotives. Technical Highlight. Prepared by the Office of Mobile Sources. EPA420-F-97-051. Available at: https://nepis.epa.gov/Exe/ZyPDF.cgi/P1001Z8C.PDF?Dockey=P1001Z8C.PDF

U.S. Environmental Protection Agency. (1999). Science Algorithms of the EPA Models-3 Community Multiscale Air Quality (CMAQ) modeling system. EPA/600/R-99/030, March 1999.

U.S. Environmental Protection Agency. (2011). Compilation of Air Pollutant Emissions Factors, Volume I: stationary point and area sources, Chapter 13: Miscellaneous Sources, Section 13.2.1 Paved Roads. Prepared by the Office of Air Quality Planning and Standards, Office of Air and Radiation, U.S. Environmental Protection Agency, Research Triangle Park (NC). Available at: https://www3.epa.gov/ttn/chief/ap42/ch13/final/c13s0201.pdf

U.S. Environmental Protection Agency. (2015a). AERMOD implementation guide. Revised August 3, 2015. Prepared by the AERMOD Implementation Workgroup, U.S. Environmental Protection Agency, Office of Air Quality Planning and Standards, Air Quality Assessment Division. Research Triangle Park (NC), August 2015. Available at: https://www3.epa.gov/ttn/scram/7thconf/aermod/aermod_implmtn_guide_3August2015.pdf

U.S. Environmental Protection Agency. (2015b). Transportation conformity guidance for quantitative hot-spot analyses in $PM_{2.5}$ and PM_{10} nonattainment and maintenance areas. Prepared by the Transportation and Regional Programs Division, Office of Transportation and Air Quality, EPA-420-B-15-084, November 2015. Available at: https://nepis.epa.gov/Exe/ZyPDF.cgi?Dockey=P100NMXM.pdf

U.S. Environmental Protection Agency. (2015c). Transportation conformity guidance for quantitative hot-spot analyses in $PM_{2.5}$ and PM_{10} nonattainment and maintenance areas: Appendices. Prepared by the Transportation and Regional Programs Division, Office of Transportation and Air Quality, EPA-420-B-15-084, November 2015. Available at: https://nepis.epa.gov/Exe/ZyPdf.cgi?Dockey=P100NN22.pdf

U.S. Environmental Protection Agency. (2017). Revisions to the guideline on air quality models: Enhancements to the AERMOD dispersion modeling system and incorporation of approaches to address ozone and fine particulate matter; Final rule. EPA-HQ-OAR-0310, FRL-9956-23-OAR. Federal Register, 82(10), 5182–5235. Available at: https://www3.epa.gov/ttn/scram/guidance/guide/appw_17.pdf.

U.S. Environmental Protection Agency. (2018a). Modeling guidance for demonstrating air quality goals for ozone, $PM_{2.5}$, and regional haze. Research Triangle Park (NC), EPA-454/R-18-009.

U.S. Environmental Protection Agency. (2018b). User's guide for the AMS/EPA Regulatory Model (AERMOD). EPA-454/B-18-001, April 2018. Available at: https://www3.epa.gov/ttn/scram/models/aermod/aermod_userguide.pdf

Attachment 1. Toxic Air Contaminants

Table A-1-1. Inhalation CPF by Chemical Abstract Service (CAS) number. Inhalation CPFs are adjusted to account for multi-pathway slope factor and/or chronic REL, where applicable (consistent with Regulation 2-5). Chemicals listed are those that were emitted from one or more sources in the West Oakland emissions inventory (Section 2). Only those chemicals with an associated inhalation CPF were modeled and therefore included in the calculation of cancer risk (Section 4).

CAS number	Chemical name	Inhalation CPF [(mg/(kg day))$^{-1}$]
71-55-6	1,1,1-Trichloroethane	–
75-35-4	1,1-Dichloroethylene	–
107-06-2	1,2-Dichloroethane	0.072
106-99-0	1,3-Butadiene	0.6
542-75-6	1,3-Dichloropropene	0.055
106-46-7	1,4-Dichlorobenzene	0.04
12391-1	1,4-Dioxane	0.027
1746-01-6	Chlorinated dioxins and furans (2,3,7,8-Tetrachlorodibenzo-p-dioxin and related compounds; California TCDD equivalent)	650000
75-07-0	Acetaldehyde	0.01
67-64-1	Acetone	–
10-702-8	Acrolein	–
7664-41-7	Ammonia	–
7440-38-2	Arsenic	180
71-43-2	Benzene	0.1
7440-41-7	Beryllium	8.4
7440-43-9	Cadmium	15
75-15-0	Carbon Disulfide	–
124-38-9	Carbon Dioxide (CO_2) (non-biogenic)	–
630-08-0	Carbon Monoxide (CO)	–
67-66-3	Chloroform	0.019
7440-50-8	Copper and Copper Compounds	–
18540-29-9	Chromium (hexavalent, 6)	560
9-90-1	DPM (Diesel Exhaust Particulate)	1.1
107-21-1	Ethylene Glycol	–
111-76-2	Ethylene Glycol Monobutyl Ether	–
100-41-4	Ethylbenzene	0.0087
50-00-0	Formaldehyde (gas)	0.021
7647-01-0	Hydrogen Chloride	–
7664-39-3	Hydrogen Fluoride	–
7783-06-4	Hydrogen Sulfide	–

CAS number	Chemical name	Inhalation CPF [(mg/(kg day))$^{-1}$]
64742-48-9	Isoparaffinic solvents C10+	–
67-63-0	Isopropyl Alcohol	–
7439-92-1	Lead and Lead Compounds	0.98
7439965	Manganese & Manganese Compounds	–
7439976	Mercury (Inorganic)	–
74-82-8	Methane (CH_4)	–
67-56-1	Methanol	–
74-83-9	Methyl Bromide	–
78-93-3	Methyl Ethyl Ketone	–
75-09-2	Methylene Chloride (Dichloromethane)	0.0035
91-20-3	Naphthalene	0.12
7440-02-0	Nickel and Nickel Compounds	0.91
10024-97-2	Nitrous Oxide (N_2O)	–
110-54-3	n-Hexane	–
98-56-6	Parachlorobenzotrifluoride (PCBTF)	–
50-32-8	Polycyclic aromatic hydrocarbons (PAH) (as benzo(a)pyrene equivalent)	86
108-95-2	Phenol	–
1336-36-3	Polychlorinated Biphenyls (PCB)	74
7782-49-2	Selenium	–
127-18-4	Tetrachloroethylene (Perchloroethylene)	0.021
108-88-3	Toluene	–
79-01-6	Trichloroethylene	0.007
1330-20-7	Xylenes (technical mixture of m, o, p-isomers)	–

Attachment 2. Permitted Stationary Sources

Table A-2-1. Permitted stationary sources in the West Oakland Source Domain. "M" indicates whether the facility was modeled (×) or not (–); facilities were not modeled if either (a) there were no $PM_{2.5}$ or TAC emissions available in the database for the base year, or (b) all TAC emissions were associated with pollutants that did not have associated cancer risk toxicities. The plant number (Plant No.) indicates a unique facility. Cities are abbreviated as "O" for Oakland, "A" for Alameda, and "E" for Emeryville. The SIC code indicates the Standard Industrial Classification code. The values of *x* and *y* are the coordinates of the source centroid in UTM zone 10 North (NAD83).

M	Plant No.	Facility Name	Address	City	SIC code	*x*	*y*	Source Category
×	24024	2150 Webster Holdings VII	2150 Webster Street	O	9631	564648.165924	4185022.458960	Generator
×	111616	AAA San Pablo Fuel Inc.	3420 San Pablo Ave	O	5411	563549.336623	4186746.924690	Gas station
×	14532	AC Transit General Office	1600 Franklin Street	O	9621	564409.165973	4184484.458940	Generator
–	23085	Acorn Restoration	2914 Poplar Street	O	7641	562956.166026	4186300.458690	Spray booth
×	16713	Alameda County Employees Retirement Assn (ACERA)	475 14th Street	O	4812	564069.166042	4184376.458890	Generator
×	20828	Alameda County General Services Agency	1111 Jackson Street	O	9199	564574.165975	4183921.459000	Generator
×	107875	Alameda County General Services Agency	165 13th Street	O	5411	564684.165951	4183963.459030	Gas station
×	10997	Alameda County GSA	661 Washington St	O	9199	563718.490000	4183843.070000	Generator and boiler
×	10998	Alameda County GSA	400 Broadway Avenue	O	9299	563845.760000	4183606.200000	Standby generator
×	13929	Alameda County GSA	1106 Madison Street	O	9199	564717.040000	4183834.660000	Standby generator
×	17114	Alameda County Public Works Agency	3455 Ettie Street	O	9532	562573.165973	4186712.458690	Generator
×	19321	Alameda Cremations	2900 Main Street, Suite 116	A	7261	562363.166189	4182717.459020	Crematory
×	3676	Alta Bates Summit Medical Center	450 30th Street	O	8062	564611.165840	4186083.458850	Generator and boiler
–	22763	Amber Flooring Inc	3441 Louise Street	O	1752	562851.080000	4186802.130000	Coatings
×	200693	Amtrak	120 Magnolia Street	O		562481.166186	4183885.458960	Generator
×	2112	Aramark Uniform Services	330 Chestnut Street	O	7218	562723.166109	4183993.458910	Boiler
×	18668	AT&T Corp	344 20th Street	O	4899	564670.058785	4184834.236440	Generator
–	200827	Automotive Collision Repair	365 26th Street	O	7532	564651.165873	4185526.458920	Autobody
–	3069	B and T One Hour Cleaners	190 14th Street	O	7216	564726.165955	4184100.459030	Petroleum dry cleaning
×	200393	BA1 1330 Broadway LLC	420 13th Street	O		564191.165976	4184276.458970	Generator
×	200620	BA1 2201 Broadway LLC	2201 Broadway	O		564482.165923	4185116.458900	Generator and boiler

M	Plant No.	Facility Name	Address	City	SIC code	*x*	*y*	Source Category
×	112534	Bart Gas & Food	1395 7th St	O	5411	562206.166118	4184385.458900	Gas Station
×	20703	Bay Area Rapid Transit Dist. (BART)	418 Clay Street	O	4911	563677.166072	4183706.459010	Generator
×	22703	Bay Area Rapid Transit	550 W MacArthur Blvd	O	6512	564569.165800	4186899.458770	Generator
×	9684	Bay Ship and Yacht Co	2900 Main Street, Suite 2100	A	3731	562367.166212	4182722.458960	Coatings/blasting
×	12691	Berkeley Millwork & Furniture Co	2279 Poplar Street	O	2511	562731.018032	4185768.066460	Finishing with heater
–	17822	Berkeley Repertory Theatre	2526 Wood Street	O	5812	562399.166012	4186237.458670	Painting operations
×	21949	Bicycle Coffee LLC	364 2nd Street	O	2043	563894.166042	4183377.459030	Coffee roaster
×	21713	Blue Bottle Coffee Company	300 Webster Street	O	2095	563994.323692	4183422.851580	Coffee roaster
×	111014	BNSF Intermodal	333 Maritime St	O	5411	560377.166300	4184470.458710	Gas station
×	15538	BNSF Railway Co	333 Maritime Street	O	4013	562230.166190	4184011.458950	Generator
–	10987	Bolero Co	2905 Union Street	O	7532	562984.165983	4186288.458700	Autobody
×	22884	Broadway Franklin LLC	1111 Broadway	O	6512	564043.166022	4184189.458930	Generator
×	210258	Burger King	1240 Broadway	O	5812	564138.165974	4184245.458950	Charbroiler
×	24153	Cafe Tartine LLC	325 Martin Luther King Way	O	2095	563327.1661	4183779.459	Coffee roaster
×	10131	California Cereal Products Inc.	1267 14th Street	O	2043	562586.166136	4184922.458790	Grain system
–	20665	California Finest Body & Frame	1415 18th St	O	7532	562386.166089	4185378.458730	Spray booth
×	111397	California Highway Patrol	3601 Telegraph Ave	O	5411	564529.375244	4186675.889090	Gas station
×	14572	California Highway Patrol-Telecommunications	3601 Telegraph Ave	O	9221	564569.885283	4186642.089800	Generator
×	21295	California Hotel	3501 San Pablo Ave	O	6513	563493.165960	4186770.458660	Generator
×	15740	California Waste Solutions - Wood Street	3300 Wood Street	O	5093	562495.166064	4186548.458720	Recycling
×	15739	California Waste Solutions-10St Street	1820 10th Street	O	5093	561475.166213	4185141.458710	Recycling
×	22649	Caltrans	200 Burma Road	O	4111	560738.166175	4186460.458630	Generator
×	100210	Caltrans - East Bay Yard	Burma Road	O	5411	560755.166135	4186467.458670	Gas station
×	200062	Caltrans SFOBB Maintenance Complex	200 BURMA RD	O	5411	560733.166177	4186456.458660	Gas station
×	146	CASS Inc,	2730 Peralta Street	O	5093	562822.166009	4186107.458720	Furnace
×	21941	Cathedral Gardens Oakland	638 21st Street	O	3679	564035.165958	4185114.458850	Generator
×	1253	Central Concrete Supply A U.S. Concrete Company	2400 Peralta Street	O	3273	562704.166064	4185937.458700	Cement Silo
–	21947	Chevron Environmental Management Company	706 Harrison Street	O	1522	564240.166026	4183668.459020	Soil vapor extraction

M	Plant No.	Facility Name	Address	City	SIC code	*x*	*y*	Source Category
×	107693	Chevron SS #9-4800	1700 Castro St	O	5411	563781.373230	4184857.894450	Gas station
×	111947	China Town 76 Unocal #0752	800 Harrison St	O	5411	564281.166049	4183753.458990	Gas Station
×	20248	CIM Group Properties	1901 Harrison Street	O	6512	564679.140000	4184629.770000	Generator and fire pump
×	20345	CIM Properties	1333 Broadway	O	6512	564093.994123	4184334.960920	Generator and boiler
×	23838	City Center 1300 LLC	1300 Clay Street	O	6531	563966.165972	4184412.458950	Generator
×	20438	City of Alameda Northside Pump Station	1253 Marina Village Parkway	A	4911	563904.166063	4182438.459100	Generator
×	14502	City of Oakland, Environmental Services Division	150 Frank Ogawa Plaza	O	9199	564173.165992	4184440.458930	Generator
×	21819	City of Oakland	455 27th St, Fire Station 15	O	9229	564573.165885	4185607.458900	Generator
×	201072	City of Oakland	1111 Broadway	O	9224	564046.420000	4184190.710000	Generator
×	14503	City of Oakland, Environmental Services Division	1 Frank Ogawa Plaza	O	9199	564064.166028	4184463.458910	Generator
×	14291	City of Oakland, Public Works Facilities	455 7th Street	O	9221	563833.166039	4183787.459030	Generator
×	14301	City of Oakland, Environmental Services Division	1605 Martin Luther King Jr Way	O	9224	563758.972178	4184774.902360	Generator
×	14302	City of Oakland, Environmental Services Division	14th & Mandela Way	O	9224	562266.166084	4185050.458770	Generator
×	109646	City of Oakland Fire Station 1	1605 Martin Luther King Way	O	5411	563796.165984	4184760.458890	Gas station
×	107940	City of Oakland-Fire Department Drill Tower	250 Fallon St	O	5411	564794.166029	4182969.459090	Gas Station
×	106473	City of Oakland-Police Admin Building	495 6th Street	O	5411	563821.166076	4183803.458970	Gas Station
–	17439	Clear Channel Outdoor	2865 Hannah Street	O	5199	562755.165971	4186373.458720	Coatings
×	111913	Clear Channel Outdoor	2857 Hannah St	O	5411	562751.166014	4186335.458710	Gas station
×	18641	Color Folio Design	1467 Park Avenue	E	7389	562617.166008	4187249.458660	Coatings
–	20821	ConGlobal Industries	555A Maritime Street	O	5085	560475.166256	4184659.458700	Roller coater
–	18431	Continental Auto Body	1355 Park Ave	E	7532	562817.165947	4187280.458640	Autobody
–	23039	Cooks Collision	1900 Martin Luther King Way	O	7532	563928.165958	4184901.458940	Autobody
–	23040	Cooks Collision	149 11th St	O	7532	564697.165942	4183778.459030	Spray booth
×	201187	Coolport LLC	575 Maritime Street	O	9224	560017.110000	4184626.200000	Generator
×	17190	County of Alameda	1221 Oak Street	O	9229	564784.165962	4183908.459030	Generator
×	13908	County of Alameda - GSA	1401 Lakeside Drive	O	9199	564725.165954	4183831.458990	Generator and boiler

M	Plant No.	Facility Name	Address	City	SIC code	*x*	*y*	Source Category
×	18947	County of Alameda - Public Works Agency	8th Ave & Between Fallon St	O	9229	564622.166034	4183582.459050	Generator
×	17739	Cushman & Wakefield	Jack London Square	O	6531	563565.166106	4183351.458960	Generator
–	20526	Custom Wood Finishing	2311 Adeline Street	O	5712	563032.165995	4185688.458740	Generator
–	22272	Dawit Auto Body	4101 Martin Luther King Way	O	7532	564365.165829	4187302.458680	Autobody
×	20537	Department of Transportation	Toll Operations Building, SF Oakland Bay Bridge	O	4911	560392.166186	4186542.458540	Generator
×	20586	Digital 720 2nd LLC	720 2nd Street	O	4813	563160.166139	4183761.458900	Generator
×	20802	Domain Residences, LLC	1389 Jefferson St	O	6512	563805.166051	4184475.458910	Generator
×	19997	DWFIU 1999 Harrison, LLC	1999 Harrison Street	O	6531	564708.984401	4184731.933590	Generator
×	11887	Dynegy Oakland LLC	50 Martin Luther King Jr Way	O	4931	563278.166088	4183491.458950	Turbines
×	8001	East Bay Municipal Utility District	1200 21st Street	O	4941	562895.166049	4185545.458780	Spray booth
×	13712	East Bay Municipal Utility District	1100 21st Street	O	4941	563100.165995	4185500.458840	Generator
×	13728	East Bay Municipal Utility District	375 11th Street	O	4941	564204.165985	4184024.458980	Microturbine
×	109891	East Bay Municipal Utility District	2144 Poplar St	O	5411	562740.166030	4185560.458750	Gas Station
×	13737	East Bay Municipal Utility District PSK	2101 7th Street	O	4941	560669.166256	4184799.458780	Generator
×	591	East Bay Municipal Utility District	2020 Wake Avenue	O	4952	562060.166061	4186640.458610	Generator
×	14238	East Bay Municipal Utility District	1001 W Red Line Ave	A	4941	561168.166359	4182649.458950	Generator
–	20061	Englund Studio	1850 Campbell Street	O	3369	562304.166125	4185571.458820	Spray booth
×	19971	Essex Portfolio LLC DBA The Grand Apartments	100 Grand Avenue	O	1522	564718.017588	4185172.851520	Generator
×	20724	FEMA	1111 Broadway	O	9111	564046.420000	4184190.710000	Generator
×	24194	Former Mobil and Ashland Bulk Fuel Terminals	909 Ferry Street (Port of Oakland, Berth 23)	O	4953	560392.166189	4185875.458610	Soil Vapor Extraction
×	22746	Fox Television Stations Inc. on behalf of KTVU	2 Jack London Square	O	4833	564257.166075	4182885.459060	Generator
×	16749	General Services Administration-East Bay Office	1301 Clay Street	O	9199	563912.165967	4184445.458890	Generator and boiler
–	3737	George V Arth & Son	110 10th St	O	7532	564726.165981	4183733.459040	Spray Booth

M	Plant No.	Facility Name	Address	City	SIC code	*x*	*y*	Source Category
×	17588	Global Power Group, Inc	3938 Horton Street	E	5311	562750.510967	4187105.463270	Generator
×	111475	Golden Bay Gas and Food	2200 Telegraph	O	5411	564367.165953	4185153.458910	Gas station
–	5776	Harold's Auto Body & Paint Shop	2126 Market Street	O	7532	563487.166011	4185366.458800	Spray booth
–	10587	HC Fine Finishes	1231 24th Street	O	7641	562909.166023	4185797.458780	Spray booth
–	200331	High End Custom and Collision	1649 28th Street	O	7532	562714.166025	4186218.458670	Autobody
×	19039	Hotel Oakland	270 13th Street	O	7011	564549.987799	4184129.882810	Generator
–	20036	Hustead's Collision Center Inc	2915 Market Street	O	7532	563630.165961	4186090.458730	Autobody
–	378	Ideal Cleaners	322 14th Street	O	7216	564436.165966	4184245.458950	Petroleum dry cleaning
×	16965	Ikea US West Inc - 165 Emeryville	4400 Shellmound Street	E	5021	562311.166002	4187352.458640	Generator
×	112176	J and O Tire	2236 Poplar St	O	5411	562850.165989	4185865.458780	Gas Station
×	20823	Jefferson Oaks Housing	1424 Jefferson St	O	9531	563894.166034	4184557.458880	Generator
×	21940	John Hansen & Sons Inc	327 Clay Street	O	5149	563545.166086	4183682.458970	Coffee roaster
×	3490	Johnson Plating Works Inc	2526 Telegraph Ave	O	3471	564430.165947	4185542.458900	Chrome plating and spray booth
×	23430	Kaiser Permanente	1950 Franklin Street	O	8063	564555.165907	4184744.458970	Generator
×	23431	Kaiser Permanente	1800 Harrison Street	O	8063	564727.165920	4184544.459000	Generator
×	23433	Kaiser Permanente	410 19th Street	O	8063	564328.165955	4184763.458920	Generator
×	24068	KBS SOR II Oakland City Center	505 14th Street	O	6512	564019.165980	4184397.458960	Generator
–	10397	Le Magic Cleaners	1706 Franklin Street	O	7216	564418.165953	4184573.458930	Closed loop dry cleaner
×	18110	Level 3 Communications LLC	1330 Broadway	O	4813	564091.979994	4184356.933650	Generator
×	23231	Level 3 Communications LLC	1970 Broadway	O	4813	564449.165974	4184842.458890	Generator
–	12569	Lithograph Reproductions Inc	4120 Martin Luther King Jr Way	O	2752	564430.165808	4187306.458740	Lithography printing
×	8511	Madison Street Press	614 Madison Street	O	2752	564529.166012	4183455.459030	Printing press
×	109725	Market Street Shell #135692	610 Market St	O	5411	563156.166075	4184124.458940	Gas station
×	12765	MCI,dba Verizon Business	1330 Broadway	O	4813	564223.165967	4184305.458950	Generator
×	13299	MetroPCS California/Florida Inc	720 2nd Street	O	4911	563163.166110	4183762.458900	Generator
×	110209	Mobile SS#63049	3400 San Pablo	O	5411	563557.165952	4186699.458730	Gas station
×	20742	Modern Coffee Enterprises Inc	4059 Emery Street	E	2095	563233.165888	4187309.458620	Coffee roaster
×	5133	Mr. Espresso	696 3rd Street	O	2095	563275.166087	4183767.458960	Coffee roaster
×	2650	Nor-Cal Metal Fabricators	1121 3rd Street	O	3479	562614.166145	4183939.458950	Sandblaster
×	1500	Northern California Power Agency	2900 Main Street, Site 1	A	4911	562350.166214	4182722.459010	Turbines
×	14423	Oakland 14th Office	475 14th Street	O	6512	564070.166005	4184375.458960	Generator
×	19514	Oakland Center 21	2101 Webster Street	O	6512	564602.165884	4185023.458930	Generator and boiler

M	Plant No.	Facility Name	Address	City	SIC code	*x*	*y*	Source Category
×	111332	Oakland Marinas	2 Webster St	O	5411	563852.166087	4183149.459000	Gas Station
×	22781	Oakland Marriott City Center	1001 Broadway	O	7011	564012.166045	4184110.459010	Generator
×	22033	Oakland Museum of California	1000 Oak Street	O	9199	564818.165994	4183721.459080	Spray Booth
×	20527	Oakland Unified School District	1011 Union Street	O	8211	562519.166083	4184691.458810	Generator
×	110551	Oakland Valero Service Center	2225 Telegraph Ave	O	5411	564314.165906	4185166.458910	Gas station
×	109903	OFD Fire Station #2	100 Jack London Square	O	5411	563393.166112	4183400.458970	Gas Station
×	109994	OFD Fire Station #3	1445 14th St	O	5411	562259.166096	4185053.458770	Gas Station
×	20093	Olympic Tug and Barge Co Inc	321 A Avenue	A	5171	562965.166147	4182944.458960	Generator
×	13494	Pacific Bell	1587 Franklin Street	O	4813	564362.165940	4184509.458900	Generator
×	14173	Pacific Gas and Electric	1919 Webster Street	O	4931	564560.165977	4184740.458900	Generator
×	14551	Pacific Gas and Electric	689 2nd Street	O	4931	563202.166106	4183633.458910	Generator
×	8227	Pacific Interment Service	1094 Yerba Buena Ave	E	7261	563548.165902	4187269.458640	Cremator
×	21029	Pacific Renaissance Plaza	388 9th St Ste 229	O	6512	564147.165974	4183921.458950	Generator
×	12318	Peerless Coffee Co	260 Oak Street	O	2095	564511.166029	4183116.459040	Coffee roaster
×	23722	Pinnacle Ag Services	2440 W 14th Street	O	3711	561300.166191	4185579.458760	Generator
×	13682	Port of Oakland	Clay & Water Street at Jack London Square	O	9621	563468.166074	4183346.458990	Generator
×	16715	Port of Oakland	651 Maritime Street	O	1799	560444.166280	4184718.458760	Generator
×	23577	Port of Oakland	1599 Maritime Street	O	4491	560760.166236	4185498.458690	Generator
×	111027	Port of Oakland	651 Maritime St	O	5411	560444.166314	4184583.458760	Gas station
×	3791	Prime Smoked Meats Inc	220 Alice Street	O	5049	564174.166067	4183265.459000	Smoke house
×	200462	Prologis	2420 West 21st Street	O		561611.166143	4186200.458680	Generator
–	18373	PS Printing LLC	2861 Mandela Parkway	O	2752	562528.166041	4186330.458750	Print press
–	6191	Quality Body and Fender	2510 Martin Luther King Way	O	7532	564096.165965	4185558.458880	Autobody
×	23547	Radio Mirchi	Pole Plaza AHN 18, Pole #110141241	O	7812	559827.166257	4186509.458600	Generator
–	15931	Redline Import - Auto Collision	2300 Market Street #C	O	7532	563540.165986	4185575.458840	Spray area
×	106875	Rino Pacific	1107 5th St	O	5411	562682.166122	4184104.458920	Gas station
×	14607	Rotunda Partners II	300 Frank Ogawa Plaza	O	6552	564150.024407	4184549.804730	Generator
×	23098	Royal Coffee Company	2523 Broadway	O	5812	564682.165897	4185486.458840	coffee roaster
×	14068	S F Bay Area Rapid Transit District	101 8th Street	O	9621	564606.166019	4183538.459010	Generator
×	19696	Safety-Kleen Systems Inc.	400 Market Street	O	4953	563110.166078	4183947.458990	Soil vapor extraction
×	23208	Safeway #3125	3889 San Pablo Ave	E	5141	563353.165963	4187112.458680	Generator
×	18658	San Francisco Bay Bridge Toll Plaza	Bay Bridge East	O	9229	560407.166233	4186541.458600	Generator
–	12725	San Pablo Auto Body	2926 San Pablo Ave	O	7532	563730.165966	4186076.458770	Spray booth

M	Plant No.	Facility Name	Address	City	SIC code	*x*	*y*	Source Category
×	20386	Satellite First Communities, L P	540 21st Street	O	8361	564210.165960	4185069.458930	Generator
×	112517	Sausal Corporation	Bay Bridge Toll Plaza	O	5411	560399.166202	4186546.458570	Gas station
×	208	Schnitzer Steel Products Company	Adeline Street	O	5093	562499.999966	4183475.097660	Electric shredder
–	16860	SFPP, L P	Bay Street, off 7th	O	4613	560823.090000	4184843.250000	Diesel additive tank
×	18268	Sierra Pacific	3213 Wood Street	O	3272	562424.166075	4186446.458730	Aggregate
–	23904	Sila Nanotechnologies Inc	2450 Mariner Square Loop	A	2819	563636.166150	4182428.459110	Wipe cleaning
–	22778	Solstice Press	113 Filbert Street	O	2752	562802.166129	4183786.458940	Lithography printing
×	112577	Southern Counties Oil Company LP	105 5th St	O	5411	564515.165988	4183298.459090	Gas station
×	16848	SPRINT	1075 7th Street	O	4812	562783.166090	4184227.458860	Generator
×	16850	SPRINT	114 Brush Street	O	4812	563080.166080	4183689.458930	Generator
×	15760	SSA Terminals (Oakland) LLC	1999 Middle Harbor Rd	O	4731	560385.166356	4183504.458880	Generator
×	111133	SSA Terminals-Oakland LLC	1999 Middle Harbor Rd	O	5411	560352.166317	4184036.458820	Gas station
–	200748	Stanford Cleaners	2134 MARKET ST	O	7389	563492.165996	4185376.458810	Dry cleaning
×	109165	State of CA - Caltrans	Oak Bay Bridge, E Side, Toll Plaza	O	5411	560420.740000	4186547.050000	Gas Station
×	19281	State of California	1515 Clay St, Elihu Harris Building	O	9441	563982.971169	4184583.007780	Generator and boiler
×	14195	State of California Department of Transportation	111 Grand Avenue	O	9621	564732.570000	4185092.270000	Generator and boiler
×	201213	SVF Latham Square Owner LLC	1611 Telegraph Avenue	O		564207.165993	4184578.458940	Boiler
–	21159	Tam's Auto Body	2300 Market Street Ste B	O	7532	563536.165942	4185564.458800	Spray booth
×	20487	Target Corporation Store #T2767	1555 40th Street	O	5311	562487.166001	4187011.458690	Generator
×	21790	Target Corporation Store #T2829	2700 5th Street	A	5311	563474.166162	4182610.459060	Generator
×	112426	Tfuels Inc. dba Grand Arco AMPM-C Kim	889 West Grand Ave	O	5411	563515.165961	4185422.458780	Gas station
×	20987	The Ellington Community Association	222 Broadway	O	6531	563773.166110	4183461.459050	Generator
×	17703	The Home Depot (Store #0627)	3838 Hollis Street	E	5311	563036.124968	4187011.436650	Generator
×	17073	T-Mobile	720 2nd Street	O	4812	563192.166114	4183660.458950	Generator
×	14837	Trans Pacific Centre	1000 Broadway	O	6512	564090.166016	4184053.459000	Generator
×	200278	Trapac	2800 7TH ST	O	5411	559401.166329	4184726.458700	Gas station
×	17431	Union Pacific Railroad	1400 Middle Harbor Road	O	4011	561766.166221	4183829.458870	Generator
×	100583	Union Pacific Railroad	1400 Middle Harbor Road	O	5411	561771.166175	4183835.458880	Gas station

M	Plant No.	Facility Name	Address	City	SIC code	*x*	*y*	Source Category
–	200538	Uptown Body and Fender	401 26th Street	O	7532	564580.165868	4185529.458890	Autobody
×	21130	US Postal Service - Building Maintenance	1675 7th Street	O	4311	561587.340000	4184448.030000	Generator and fire pump
×	23711	USPA City Center LLC	555 12th Street	O	6512	563819.165993	4184285.458950	Generator and boiler
×	14711	Verizon Business	1999 Harrison Street	O	4813	564743.165909	4184727.458960	Generator
×	22412	Verizon Wireless	1404 Franklin Street	O	4812	564296.165973	4184311.458980	Generator
×	16284	Verizon Wireless (Alameda Perm)	114 Brush Street	O	4812	563080.166085	4183688.458990	Generator
×	18297	Verizon Wireless (Bay Bridge East)	107 Burma Road	O	4812	559595.580000	4186253.340000	Standby generator
×	23143	Viridis Fuels	2040 Wake Avenue	O	2861	561701.520000	4186478.240000	Boiler
×	22483	Watermark Bayside, LLC dba Bayside Park	1440 40th Street	E	8051	562722.165936	4187177.458620	Generator
×	5385	Weatherford BMW	575 West Grand Avenue	O	7532	564168.165947	4185174.458840	Spray booth
×	112042	Westco Gas	731 West Macarthur Blvd	O	5411	564109.914073	4186891.051810	Gas station
×	22058	Westcore City Properties, LLC	1221 Broadway	O	2812	564098.166021	4184261.458990	Generator
–	2620	WH Strehle Company	494 36th Street	O	7532	564686.165809	4186614.458780	Autobody
×	23954	Windstream	427 14th Street	O	6531	564224.165990	4184308.458940	Generator

Attachment 3. Truck-Related Businesses

Table A-3-1. Businesses with truck fleet activity operating in the West Oakland Source Domain. Only businesses with an assigned ID were included in this analysis; those excluded were either missing information or had < 4 vehicles per day (VPD). The reference ("Ref.") of the activity information was collected from either a 2019 survey (S19), a 2009 survey (S09), or assumed parameters (A, where a number in parentheses indicates the ID from which the information is based on). A hyphen (–) indicates that the business was excluded from the analysis due to inappropriate business or activity type, and "n/a" indicates that no information was available. The fleet assumed for each business was either HHDT only (all EMFAC2017-based HHDT vehicles except Port Trucks), MHDT only, bus only (BUS), or a mixed fleet (mix) with 0.265 HHDT (Non-Port Truck), 0.10 LHDT, 0.135 MHDT, 0.50 Port Trucks (T7 POAK). All business addresses are located in Oakland, except those with an asterisk (located in Emeryville).

ID	Business Name	Address	VPD	Ref.	Fleet	Activity Type
	All Star Moving & Storage	1468 14th Street	0	–	–	Storage only
	Alpi International Ltd.	1685 34th Street	< 4	–	–	Wholesale product supplier
	American President Lines Ltd	1579 Middle Harbor Road	< 4	–	–	Shipment management
1	AM&S Transportation Co/ Trade Winds Import Export	1700 24th Street	70	S19	mix	Trucking
54	AMPCO Adeline	1599 Adeline Street	1000	S19	mix	Parking facility
53	AMPCO MLK	1 Martin Luther King Jr Way	1000	S19	mix	Parking facility
36	Aramark Uniform Services	330 Chestnut Street	5	A	MHDT	Uniform rental services
2	Atthowe Transportation Co Inc.	3924 Market Street	5	S19	mix	Carrier/broker
24	AV Trucking Co Inc.	1155 3rd Street	41	S19	mix	Office
3	Bay Area Container Transport	3427 Ettie Street	19	S19	mix	Broker
55	Best Bay Trucking	1 Market Street	50	S19	mix	Trucking
4	Cademartori Trucking	1833 Peralta Street	22	S19	mix	Shipping/trucking
5	California Cereal Products	1267 14th Street	5	S19	mix	Food processing
6	California Waste Solutions Inc. - 10th	1820 10th Street	50	S19	mix	Recycling
37	California Waste Solutions Inc. - Wood	3300 Wood Street	50	A (6)	mix	Recycling
7	CASS, Inc	2730 Peralta Street	6	S19	mix	Recycling
38	CCY Inc.	2505 Poplar Street	5	A	mix	Importers
8	Central Concrete	2400 Peralta Street	13	S19	mix	Concrete

ID	Business Name	Address	VPD	Ref.	Fleet	Activity Type
59	CFN Fuel Station	2236 Poplar Street	80	A (63)	mix	Gas station
	Commander Moving	1829 Mandela Pkwy	< 4	–	–	Moving/storage
	Dusty & Sons Truck Tire Center	2201 Mandela Pkwy	< 4	–	–	Tire sales
9	East Bay Resources	2430 Willow Street	5	S19	mix	Recycling
60	EBMUD Adeline	2127 Adeline Street	84	S09	mix	Office and yard
61	EMBUD Wake	2020 Wake Avenue	84	A (60)	mix	Yard
	FBC International Co.		–	–	–	Marketing company
10	Form and Reform	2601 Adeline Street	3	S19	mix	Light manufacturing
40	Golden Bear Produce	315 Franklin Street	112	S09	mix	Carrier
	Green Pro Tech (DPF Cleaning)	18th & Campbell	< 4	–	–	Diesel particulate filter cleaning
41	Green Tech Imports	2811 Adeline Street	5	A	mix	Shipping
42	Greyhound Bus	2103 San Pablo Avenue	55	S09	BUS	Bus
56	GST Transport	1 Market Street	50	S19	mix	Shipping/inspection
57	High Mountain Transport LLC	2505 Bataan Avenue	20	S19	mix	Trucking
43	Iron Mountain Information Management	1350 West Grand Ave	5	A	MHDT	Shredding/storage
11	ISSA Transportation Services, LLC (JB Truck Repair)	1639 18th St	10	S19	mix	Truck repair
	JB Truck Electrical Repair	1433 18th St	< 4	–	–	Truck services
12	J&A Truck Repair	2300 Poplar Street	14	S19	mix	Truck repair
44	J&O Tires/Scales	2401 Union Street	5	S09	mix	Truck services
13	JH Fitzmaurice	2857 Hannah Street *	4	S19	mix	Home construction and improvement
14	Kamal Trucking Corp	526 2nd Street	56	S19	mix	Carrier
	KMC Trading (Chang's)	2505 Poplar St	< 4	–	–	Recycling
15	Lange Trucking/Hoovestol	2226 Campbell Street	26	S19	mix	Trucking
62	Lenger & Sons Produce Express	2565 Buna Street #90	5	A	MHDT	Trucking (food)
45	Matheson Mail Transportation	2500 Poplar Street	30	S09	mix	Local general freight trucking
46	Mayway Corporation	1338 Mandela Pkwy	5	A	mix	Distribution
16	Mindful Distribution	2935 Adeline Street	4	S19	MHDT	Beer distributor

ID	Business Name	Address	VPD	Ref.	Fleet	Activity Type
	MK Enterprises	2225 Campbell St	< 4	–	–	Print advertising
	Mueller Nicholls	2400 Union St	< 4	–	–	Carrier
17	Mutual Express Company	1700 West Grand Avenue	40	S19	mix	Trucking
18	Narayan's Trucking Inc.	1155 3rd Street, Suite 260	41	S19	mix	Office
19	National Recycling	1312 Kirkham Ct	5	S19	mix	Recycling
20	Natural Logistics	Beach Street *	14	S19	mix	Shipping/trucking
58	Oakland Port Trucking	1 Market Street	25	S19	mix	Trucking
21	OMSS	10 Burma Road	1200	S19	mix	Truck parking
22	PACE Supply (Morgan Southern)	425 Market Street	75	S19	mix	Plumbing wholesale
23	Pacific Coast Container (PCC Logistics)	2498 16th Street	58	S19	mix	Broker
25	Pacific Coast Supply	1735 24th Street	10	S19	mix	Building materials
	Pacific Rail Services	1408 Middle Harbor Road	n/a	–	–	Repair
26	Portillo Trucking Company	160 Franklin Street	16	S19	mix	Trucking
27	Quintero Trucking	2270 Poplar Street	21	S19	mix	Trucking
63	Rinehart Oil Truck Fueling Station	1107 5th Street	80	S19	mix	Gas station
	RCM International (Martin Construction)	2850 Poplar Street	< 4	–	–	Concrete mixing
28	S.F. Enterprises (Modern Express and Courier)	2525 Mandela Pkwy	7	S19	mix	Yard
29	Saroni Food Services	1301 26th Street	12	S19	mix	Food (cold storage facility)
30	Sea Logix	1425 Maritime Street Bldg 319	5	A	mix	Trucking/drayage
47	Sierra Concrete	3211 Wood Street	10	A	mix	Concrete
	Skasol	1696 W Grand Avenue	< 4	–	–	Manufacturer
31	Starline Supply Company	2401 Peralta Street	8	S19	mix	Carrier
	Starving Student Movers	2850 Poplar Street	4	–	–	Moving company
	Steel Company (name unknown)	1699 W Grand Avenue	n/a	–	–	Steel
48	Sutta Shredding Company	1221 3rd Street	5	A	MHDT	Recycling
	Sweet Maria's Coffee Warehouse	2823 Adeline Street	< 4	–	–	Retail
	Terminal Maintenance Company	2502 Middle Harbor Drive	n/a	–	–	Carrier
49	TFS Trucking	2226 Myrtle Street	10	A	mix	Yard

ID	Business Name	Address	VPD	Ref.	Fleet	Activity Type
32	Tighe Transportation & Wisle	2230 Willow Street	2	S19	mix	Trucking
	Transpacific Trading	2433 Poplar St	< 4	–	–	Tire sales
50	U.S. Freight Systems	1819 10th Street	10	A	mix	Shipping/trucking
51	U.S. Postal Service Depot	1675 7th Street	1034	S09	HHDT	Postal depot
33	VA Transportation Inc.	1340 Mandela Pkwy	47	S19	mix	Shipping/trucking
	Western Seafare	1297 26th Street	n/a	–	–	Refrigerated warehouse
	Western States Teleport Inc.	2303 Poplar Street	–	–	–	Telephone company
34	Wings Century Trucking	1599 Maritime Street	50	S19	mix	Trucking
35	Wyse Logistics	1301 24th Street	56	S19	mix	Drayage, warehouse, transloading, bulk trucks