

## 4.10 Air Quality

### 4.10.1 Introduction

This section describes the existing air quality conditions in the Russian River Estuary Management Project (Estuary Management Project or proposed project) area and evaluates potential impacts associated with air quality and greenhouse gas (GHG) emissions as a result of Estuary Management Project implementation. The Setting includes a discussion of the regional geography, climate and meteorology, and sensitive receptors. The Regulatory Framework describes pertinent state and local laws related to air quality and GHG emission considerations of the Estuary Management Project. The Impacts and Mitigation Measures section defines significance criteria used for the impact assessment and presents a discussion of potential project-related impacts.

### 4.10.2 Setting

The primary factors that determine air quality and GHG impacts are the locations of air pollutant sources and the amounts of pollutants emitted. Other important factors, which are discussed below, include regional geography, existing air quality, attainment status, climate and meteorology, sensitive receptors, and background on GHG emission and climate change.

#### Regional Geography

The Estuary Management Project Area includes the land surrounding the Russian River from the Pacific Ocean upstream to Duncans Mills in Sonoma County. This location is within the North Coast Air Basin (NCAB), which encompasses Del Norte, Humboldt, Trinity, Mendocino, and the northern portion of Sonoma counties. The NCAB is comprised of three air districts, the North Coast Unified Air Quality Management District, the Mendocino County Air Quality Management District, and the Northern Sonoma County Air Pollution Control District (NSCAPCD). The Estuary Management Project Area is under the jurisdiction of the NSCAPCD, which comprises the northern portion of Sonoma County.<sup>1</sup> The NSCAPCD regulates air quality within the portion of Sonoma County that falls within the NCAB (CARB, 2010a).

#### Existing Air Quality

The NSCAPCD operates a regional monitoring network that measures the ambient concentrations of criteria pollutants. Existing levels of air quality of concern in the study area can generally be inferred from ambient air quality measurements conducted by NSCAPCD at its closest stations, the Guerneville and Healdsburg monitoring stations located approximately eight miles and nineteen miles to the northeast of the Estuary Management Project Area, respectively. The Guerneville monitoring station measures concentrations of particulate matter equal to or less than 10 microns in diameter (PM<sub>10</sub>) and the Healdsburg station measures concentration of ozone (CARB, 2010b).

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<sup>1</sup> The southern boundary of the NSCAPCD excludes approximately the southern one third of the County. The southern third of Sonoma County air is regulated by the Bay Area Air Quality Management District (BAAQMD) (NSCAPCD, 2010a).

Background ambient concentrations of pollutants are determined by pollutant emissions in a given area as well as wind patterns and meteorological conditions for that area. As a result, background concentrations can vary among different locations within an area. However, areas located close together and exposed to similar wind conditions can be expected to have similar background pollutant concentrations. **Table 4.10-1** shows a five-year (2005–2009) summary of PM10 monitoring data collected at the Guerneville station and ozone monitoring data collected at the Healdsburg station. The data are compared with the California Ambient Air Quality Standards (CAAQS) and National Ambient Air Quality Standards (NAAQS). As indicated in the table, there have been no exceedances of the standards between 2005 and 2009. Following the table are summary descriptions of these criteria pollutants.

**TABLE 4.10-1  
 AIR QUALITY DATA SUMMARY (2005–2009) FOR THE RUSSIAN RIVER  
 ESTUARY MANAGEMENT AREA**

Pollutant	Standard	Monitoring Data by Year				
		2005	2006	2007	2008	2009
<b>Ozone (ppm)</b>						
Highest 1 Hour Average		0.08	0.07	0.07	0.08	0.07
Days over 1 Hour State Standard	0.09	0	0	0	0	0
Highest 8 Hour Average		0.060	0.060	0.067	0.065	0.064
Days over 8 Hour National Standard	0.075	0	0	0	0	0
Days over 8 Hour State Standard	0.070	0	0	0	0	0
<b>Particulate Matter (PM10) (µg/m<sup>3</sup>)</b>						
Highest 24 Hour Average		32	30	31	41	28
Days over State Standard	50	0	0	0	0	0
Days over National Standard	150	0	0	0	0	0
Annual Average		11.8	14.5	13.8	13.3	ND
Exceed State Standard?	20	No	No	No	No	ND

ppm = parts per million  
 µg/m<sup>3</sup> = micrograms per cubic meter; ND = No data available

Measurements are usually collected every six days. Days over the standard represent the estimated number of days that the standard would have been exceeded if sampling was conducted every day.

SOURCE: CARB 2010c.

### **Ozone**

Ozone is a respiratory irritant and an oxidant that increases susceptibility to respiratory infections and that can cause substantial damage to vegetation and other materials. Ozone is not emitted directly into the atmosphere, but is a secondary air pollutant produced in the atmosphere through a complex series of photochemical reactions involving reactive organic gases (ROG) and oxides of nitrogen (NO<sub>x</sub>). ROG and NO<sub>x</sub> are known as precursor compounds for ozone. Significant ozone production generally requires ozone precursors to be present in a stable atmosphere with strong sunlight for approximately three hours.

Ozone is a regional air pollutant because it is not emitted directly by sources, but is formed downwind of sources of ROG and NO<sub>x</sub> under the influence of wind and sunlight. Ozone concentrations tend to be higher in the late spring, summer, and fall, when the long sunny days combine with regional subsidence inversions to create conditions conducive to the formation and accumulation of secondary photochemical compounds, like ozone.

### ***Particulate Matter***

PM<sub>10</sub> and particulate matter equal to or less than 2.5 microns in diameter (PM<sub>2.5</sub>) represent fractions of particulate matter that can be inhaled into air passages and the lungs and can cause adverse health effects. Particulate matter in the atmosphere results from many kinds of dust- and fume-producing industrial and agricultural operations, fuel combustion, and atmospheric photochemical reactions. Some sources of particulate matter, such as demolition and construction activities, are more local in nature, while others, such as vehicular traffic, have a more regional effect. Very small particles of certain substances (e.g., sulfates and nitrates) can cause lung damage directly, or can contain absorbed gases (e.g., chlorides or ammonium) that may be injurious to health. Particulates can also damage materials and reduce visibility.

### ***Attainment Status***

The Sonoma County portion of the NCAB is considered in attainment<sup>2</sup> or unclassified for all of the State and federal standards (NSCAPCD, 2010b). Under the California Clean Air Act (CCAA), areas not in compliance with a State or federal standard must prepare an air pollution reduction plan. Since the northern Sonoma County portion of the NCAB is in attainment status for all criteria pollutants; it is not required to have an air pollution reduction plan.

## **Climate and Meteorology**

Air quality is affected by the location, quantity, source, and the duration of pollutant emissions, and by meteorological conditions that influence movement and dispersal of pollutants. The degree of air pollution is dependent on the ability of the atmosphere to disperse the contaminated air. Atmospheric conditions, such as wind speed and direction, and topographic and climatologic factors also greatly determine the amount of pollution that concentrates in an area (BAAQMD, 1999).

Wind circulation, inversion, air stability, solar radiation, and topography all play a role in air pollution by reducing the amount of pollutants dispersed by and allowed to concentrate in the atmosphere. Higher wind speeds allow for more circulation and greater dispersion of pollutants, while lower wind speeds result in more stable air and allow for greater concentrations of pollutants. Inversions tend to cap the mixing of air to each layer and increase air stability, consequently limiting the amount of air circulation. The more stable the air, the slower the mixing, resulting in an increased probability for air pollutants to build up and exceed ambient air quality standards. The stability of the atmosphere is highly dependent upon the vertical distribution of temperature with height. Solar radiation increases

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<sup>2</sup> Attainment is a term that applies to a geographical area identified to have air quality as good as, or better than, the national and/or California ambient air quality standards (NAAQS/CAAQS). An area may be an attainment area for one pollutant and a nonattainment area for others.

the potential for higher ozone levels. In the presence of ultraviolet sunlight and warm temperatures, ROG and NO<sub>x</sub> react to form secondary photochemical pollutants, including ozone. Surrounding topography, such as mountains, hills and valleys, affects wind patterns and wind speeds that play a role in the dispersal and concentration of air pollutants (BAAQMD, 1999).

The coastal regions of Sonoma County are influenced by marine winds and coastal fog that moderate temperature. Subsidence inversions, occurring when a warm air layer acts as a cap on an underlying cooler air layer, occur frequently, particularly during the fall and winter. These inversions trap pollutants released at ground level in the valleys (BAAQMD, 2007). This is especially true throughout the summer and during cold winter nights. Because of this cap effect, inland valleys are particularly susceptible to pollution problems. The topographical features that contour Sonoma County serve to channel surface flow, but also inhibit dispersion of pollutant emissions (USACE, 1982).

Predominant winds are typically out of the south during spring, summer, and fall and out of the northwest during the winter. Winds are most variable during winter and most persistent during summer. Wind speeds are highest during spring and lowest in fall. In coastal areas such as the Estuary Management Project Area, northwest (off-shore) winds are common in spring and summer. Calm conditions occur frequently during nighttime hours during all seasons, and during winter into the late morning hours (USACE, 1982).

### ***Sensitive Receptors***

For the purposes of air quality and public health and safety, sensitive receptors are generally defined as land uses with population concentrations that would be particularly susceptible to disturbance from dust and air pollutant concentrations, or other disruptions associated with project construction and/or operation. Sensitive receptor land uses generally include schools, day care centers, hospitals, residential areas, and parks. Some sensitive receptors are considered to be more sensitive than others to air pollutants. The reasons for greater than average sensitivity include pre-existing health problems, proximity to emissions sources, or duration of exposure to air pollutants. Schools, hospitals, and convalescent homes are considered to be relatively sensitive to poor air quality because children, elderly people, and the infirmed are more susceptible to respiratory distress and other air quality-related health problems than the general public. Residential areas are considered sensitive to poor air quality because people usually stay home for extended periods of time, with associated greater exposure to ambient air quality. Recreational uses are also considered sensitive due to the greater exposure to ambient air quality conditions because vigorous exercise associated with recreation places a high demand on the human respiratory system.

With regard to the Project Area, the primary area of concern is Jenner, a small coastal community, near the mouth of the Russian River. The estimated population of Jenner ranges between 167 and 424 depending on the season (Zip Code Database, 2000). The closest residence to the proposed lagoon outlet channel is approximately 1,000 feet to the east, across the lagoon along State Route 1 (Coast Highway) and the closest recreation area is Goat Rock Beach.

### **Greenhouse Gas Emissions and Climate Change**

Some gases in the atmosphere affect the Earth's heat balance by absorbing infrared radiation. These gases can prevent the escape of heat in much the same way as glass in a greenhouse. This is often referred to as the "greenhouse effect," and it is responsible for maintaining a habitable climate. On Earth, the gases believed to be most responsible for climate change are water vapor, carbon dioxide (CO<sub>2</sub>), methane (CH<sub>4</sub>), nitrous oxide (N<sub>2</sub>O), hydrofluorocarbons, perfluorocarbons, and sulfur hexafluoride (SF<sub>6</sub>). Enhancement of the greenhouse effect can occur when concentrations of these gases exceed the natural concentrations in the atmosphere. Of these gases, CO<sub>2</sub> and CH<sub>4</sub> are emitted in the greatest quantities from human activities. Emissions of CO<sub>2</sub> are largely by-products of fossil fuel combustion, whereas CH<sub>4</sub> primarily results from off-gassing associated with agricultural practices and landfills. SF<sub>6</sub> is a GHG commonly used in the utility industry as an insulating gas in transformers and other electronic equipment. SF<sub>6</sub>, while comprising a small fraction of the total GHGs emitted annually world-wide, is a very potent GHG with 23,900 times the climate change potential as CO<sub>2</sub>.<sup>3</sup> There is widespread international scientific agreement that human-caused increases in GHGs has and will continue to contribute to climate change, although there is much uncertainty concerning the magnitude and rate of the warming.

Some of the potential resulting effects in California of climate change may include loss in snow pack, sea level rise, more extreme heat days per year, more high ozone days, larger forest fires, and more drought years (CARB, 2008a). Globally, climate change has the potential to impact numerous environmental resources through potential, though uncertain, impacts related to future air temperatures and precipitation patterns. The projected effects of climate change on weather and climate are likely to vary regionally, but according to a report published by the Intergovernmental Panel on Climate Change (IPCC), effects are expected to include the following (IPCC, 2001):

1. Higher maximum temperatures and more hot days over nearly all land areas;
2. Higher minimum temperatures, fewer cold days and frost days over nearly all land areas;
3. Reduced diurnal temperature range over most land areas;
4. Increase of heat index over land areas; and
5. More intense precipitation events.

In addition, there are several secondary effects that are projected to result from climate change, including global rise in sea level, impacts to agriculture, changes in disease vectors, and changes in habitat and biodiversity. While the possible outcomes and the feedback mechanisms involved are not fully understood, and much research remains to be done, the potential for substantial environmental, social, and economic consequences over the long term may be high.

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<sup>3</sup> Climate change potential is the potential of a gas or aerosol to trap heat in the atmosphere. CO<sub>2</sub> is assigned a climate change potential of 1.

## 4.10.3 Regulatory Framework

### Air Pollutants of Concern

#### ***Criteria Air Pollutants***

Regulation of air pollution is achieved through both national and State ambient air quality standards and emission limits for individual sources of air pollutants. As required by the federal Clean Air Act, the United States Environmental Protection Agency (USEPA) has identified criteria pollutants and has established national ambient air quality standards (NAAQS) to protect public health and welfare. The NAAQS are defined as the maximum acceptable concentration that may be reached, but not exceeded more than once per year. The USEPA has established the NAAQS for ozone, carbon monoxide (CO), nitrogen dioxide (NO<sub>2</sub>), sulfur dioxide (SO<sub>2</sub>), particulate matter (i.e., PM<sub>10</sub>, PM<sub>2.5</sub>), and lead. These pollutants are called “criteria” air pollutants because standards have been established for each of them to meet specific public health and welfare criteria.

To protect human health and the environment, the USEPA has set “primary” and “secondary” maximum ambient thresholds for all criteria pollutants. Primary thresholds are set to protect human health, particularly sensitive receptors such as children, the elderly, and individuals suffering from chronic lung conditions such as asthma and emphysema. Secondary standards are set to protect the natural environment and prevent further deterioration of animals, crops, vegetation, and buildings.

California has adopted more stringent ambient air quality standards (i.e., CAAQS) for most of the criteria air pollutants. **Table 4.10-2** presents the national and State ambient air quality standards and provides a brief discussion of the related health effects and principal sources for each pollutant. California has also established ambient air quality standards for sulfates, hydrogen sulfide, and vinyl chloride; however, air emissions of these pollutants are not expected to occur under the Estuary Management Project, therefore are not discussed further in the section.

### **Federal**

#### ***Clean Air Act***

The federal Clean Air Act (CAA) is a comprehensive federal law that regulates air emissions from area, stationary, and mobile sources. This law authorizes the USEPA to establish NAAQS to protect public health and the environment. The CAA specifies future dates for achieving compliance with the NAAQS and mandates that states submit and implement a State Implementation Plan (SIP) for local areas that do not meet the standards. The SIPs must include pollution control measures that demonstrate how the standards would be met.

### **State**

The California Air Resources Board (CARB) is responsible for establishing and reviewing the State standards, compiling the California SIP and securing approval of the plan from the USEPA, conducting research and planning, and identifying toxic air contaminants. CARB also regulates mobile sources of emissions in California, such as construction equipment, trucks, and automobiles,

**TABLE 4.10-2  
AMBIENT AIR QUALITY STANDARDS FOR CRITERIA POLLUTANTS**

Pollutant	Averaging Time	State Standard	National Standard	Health Effects	Pollutant Characteristics and Major Sources
Ozone	1 Hour 8 Hour	0.090 ppm 0.070 ppm	– 0.075 ppm	Short term exposures to high concentrations can irritate eyes and lungs. Long-term exposure may cause permanent damage to lung tissue.	Ozone is a secondary pollutant that is formed in the atmosphere through reactions between reactive organic gases (ROGs) and nitrogen oxides (NOx) in the presence of sunlight. Major sources of ROGs and NOx include combustion processes (including motor vehicle engines) and evaporative solvents, paints and fuels.
Carbon Monoxide (CO)	1 Hour 8 Hour	20 ppm 9.0 ppm	35 ppm 9 ppm	Classified as a chemical asphyxiant, CO interferes with the transfer of fresh oxygen to the blood and deprives sensitive tissues of oxygen. Exposure to high CO concentrations can cause headaches, dizziness, fatigue, unconsciousness, and even death.	CO is an odorless, colorless gas that is formed by incomplete combustion of fuels. The primary source of CO is the internal combustion engine, primarily gasoline-powered motor vehicles.
Nitrogen Dioxide (NO <sub>2</sub> )	1 Hour Annual	0.18 ppm 0.030 ppm	– 0.053 ppm	Irritating to eyes and respiratory tract.	NO <sub>2</sub> is a reddish brown gas that is a by-product of combustion. Motor vehicles and industrial operations are the main sources of NO <sub>2</sub> .
Sulfur Dioxide (SO <sub>2</sub> )	1 Hour 3 Hour 24 Hour Annual	0.25 ppm – 0.04 ppm –	– 0.5 ppm 0.14 ppm 0.03 ppm	Irritates upper respiratory tract; injurious to lung tissue. Can yellow the leaves of plants, destructive to marble, iron, and steel. Limits visibility and reduces sunlight.	SO <sub>2</sub> is a colorless acid gas with a strong odor. Fuel combustion, chemical plants, sulfur recovery plants, and metal processing are the main sources of this pollutant.
Respirable Particulate Matter (PM <sub>10</sub> )	24 Hour Annual	50 µg/m <sup>3</sup> 20 µg/m <sup>3</sup>	150 µg/m <sup>3</sup> 50 µg/m <sup>3</sup>	May irritate eyes and respiratory tract, decreases in lung capacity, cancer and increased mortality. Produces haze and limits visibility.	Solid or liquid particles in the atmosphere. Sources include dust and fume-producing industrial and agricultural operations, combustion, atmospheric photochemical reactions, and natural activities (e.g., wind-raised dust and ocean sprays).
Fine Particulate Matter (PM <sub>2.5</sub> )	24 Hour Annual	– 12 µg/m <sup>3</sup>	35 µg/m <sup>3</sup> 15.0 µg/m <sup>3</sup>	Increases respiratory disease, lung damage, cancer, and premature death. Reduces visibility and results in surface soiling.	Solid or liquid particles in the atmosphere. Major sources include fuel combustion in motor vehicles, equipment, and industrial sources; residential and agricultural burning. PM <sub>2.5</sub> may also be formed from photochemical reactions of other pollutants, including NOx, SO <sub>2</sub> , and organics.
Lead	Monthly Quarterly	1.5 µg/m <sup>3</sup> –	– 1.5 µg/m <sup>3</sup>	Disturbs the nervous system, kidney function, immune system, reproductive and developmental systems and the cardio vascular system.	Present source: lead smelters, battery manufacturing & recycling facilities. Past source: combustion of leaded gasoline.

ppm = parts per million  
µg/m<sup>3</sup> = micrograms per cubic meter

SOURCE: BAAQMD, 1999; CARB, 2008b.

and oversees the activities of California's air quality management districts, which are organized at the county or regional level. County or regional air quality management districts, such as the NSCAPCD, are primarily responsible for regulating stationary sources at industrial and commercial facilities within their geographic areas and for preparing the air quality plans that are required under the federal CAA and the California CAA.

### **Assembly Bill 32 – California Climate Change Solutions Act**

In 2005, Executive Order S-3-05 was established, which set forth a series of target dates (listed below) by which statewide emissions of GHG would be progressively reduced:

1. By 2010, reduce emissions to 2000 levels;
2. By 2020, reduce GHG emissions to 1990 levels; and
3. By 2050, reduce GHG emissions to 80 percent below 1990 levels.

In 2006, California passed the California Climate change Solutions Act of 2006 (Assembly Bill [AB] No. 32; California Health and Safety Code Division 25.5, Sections 38500, et seq., or AB 32), which requires CARB to design and implement emission limits, regulations, and other measures, such that statewide GHG emissions are reduced to 1990 levels by 2020 (representing an approximate 30 percent reduction in emissions from “business as usual”).

In June 2007, CARB directed staff to pursue 37 early actions for reducing GHG emissions under AB 32. The broad spectrum of strategies to be developed includes a Low Carbon Fuel Standard, regulations for refrigerants with high climate change potentials, guidance and protocols for local governments to facilitate GHG reductions, and green ports (CARB, 2007).

The CARB staff evaluated all the recommendations submitted on the GHG reduction strategies and published the *Expanded List of Early Action Measures To Reduce Greenhouse Gas Emissions In California* (CARB, 2007). Based on its additional analysis, CARB staff recommended the expansion of the early action list to a total of 44 measures. Nine of the strategies meet the AB 32 definition of discrete early action measures. Discrete early action measures are measures that became enforceable by January 1, 2010. The discrete early action items include: low carbon fuel standards for ethanol, biodiesel, hydrogen, electricity, compressed natural gas, liquefied petroleum gas and biogas; restrictions on high climate change potential refrigerants; landfill methane capture, smartway truck efficiency; port electrification; reduction of perfluorocarbons from the semiconductor industry; reduction of propellants in consumer products; a tire inflation program; and SF<sub>6</sub> reductions from non-electricity sector.

The 2020 target reductions are currently estimated to be 174 million metric tons of CO<sub>2</sub> equivalent (CO<sub>2</sub>e). In total, the 44 recommended early actions have the potential to reduce GHG emissions by at least 42 million metric tons of CO<sub>2</sub>e emissions by 2020, representing about 25 percent of the estimated reductions needed by 2020. CARB staff has developed 1990 and 2020 GHG emission inventories in order to refine the projected reductions needed by 2020. The 44 measures are presented in **Table 4.10-3** and are in the sectors of fuels, transportation, forestry, agriculture, education, energy efficiency, commercial, solid waste, cement, oil and gas, electricity, and fire suppression.

**TABLE 4.10-3  
RECOMMENDED AB32 GREENHOUSE GAS MEASURES TO BE INITIATED BY CARB BY 2012**

<b>ID #</b>	<b>Sector</b>	<b>Strategy Name</b>	<b>ID #</b>	<b>Sector</b>	<b>Strategy Name</b>
1	Fuels	Above Ground Storage Tanks	23	Commercial	SF <sub>6</sub> reductions from the non-electric sector
2	Transportation	Diesel – Off-road equipment (non-agricultural)	24	Transportation	Tire inflation program
3	Forestry	Forestry protocol endorsement	25	Transportation	Cool automobile paints
4	Transportation	Diesel – Port trucks	26	Cement	Cement (A): Blended cements
5	Transportation	Diesel – Vessel main engine fuel specifications	27	Cement	Cement (B): Energy efficiency of California cement facilities
6	Transportation	Diesel – Commercial harbor craft	28	Transportation	Ban on HFC release from Motor Vehicle AC service/dismantling
7	Transportation	Green ports	29	Transportation	Diesel – off-road equipment (agricultural)
8	Agriculture	Manure management (methane digester protocol)	30	Transportation	Add AC leak tightness test and repair to Smog Check
9	Education	Local gov. Greenhouse Gas (GHG) reduction guidance / protocols	31	Agriculture	Research on GHG reductions from nitrogen land applications
10	Education	Business GHG reduction guidance/protocols	32	Commercial	Specifications for commercial refrigeration
11	Energy Efficiency	Cool communities program	33	Oil and Gas	Reduction in venting/ leaks from oil and gas systems
12	Commercial	Reduce high Climate change Potential (GWP) GHGs in products	34	Transportation	Requirement of low-GWP GHGs for new Motor Vehicle ACs
13	Commercial	Reduction of perfluorocarbons (PFCs) from semiconductor industry	35	Transportation	Hybridization of medium and heavy-duty diesel vehicles
14	Transportation	SmartWay truck efficiency	36	Electricity	Reduction of SF <sub>6</sub> in electricity generation
15	Transportation	Low Carbon Fuel Standard (LCFS)	37	Commercial	High GWP refrigerant tracking, reporting and recovery program
16	Transportation	Reduction of HFC-134a from DIY Motor Vehicle AC servicing	38	Commercial	Foam recovery/ destruction program
17	Waste	Improved landfill gas capture	39	Fire Suppression	Alternative suppressants in fire protection systems
18	Fuels	Gasoline disperser hose replacement	40	Transportation	Strengthen light-duty vehicle standards
19	Fuels	Portable outboard marine tanks	41	Transportation	Truck stop electrification with incentives for truckers
20	Transportation	Standards for off-cycle driving conditions	42	Transportation	Diesel – Vessel speed reductions
21	Transportation	Diesel – Privately owned on-road trucks	43	Transportation	Transportation refrigeration – electric standby
22	Transportation	Anti-idling enforcement	44	Agriculture	Electrification of stationary agricultural engines

SOURCE: CARB, 2008d.

### **State Office of Planning and Research**

Senate Bill (SB) 97 “2007 Statutes, Ch. 185” acknowledges that local agencies must analyze the environmental impact of GHG under the California Environmental Quality Act (CEQA). Furthermore, the bill requires the State Office of Planning and Research (OPR) to develop CEQA guidelines for analyzing and mitigating GHG emissions. To comply with requirements set forth in SB 97, OPR published a technical advisory titled *CEQA and Climate Change: Addressing Climate Change through California Environmental Quality Act (CEQA) Review*. This advisory acknowledges the need for a threshold for GHG emissions and notes that OPR has asked CARB to recommend a method for setting thresholds to encourage consistency and uniformity in GHG analyses in CEQA documents throughout the State (OPR, 2004).

In response to OPR’s request, CARB has recommended that industrial projects that meet interim CARB performance standards for construction and transportation emissions, and emit no more than 7,000 metric tons of CO<sub>2</sub>e per year from non-transportation related GHG sources, should be presumed to have a less than significant impact related to climate change. Non-transportation sources include combustion related components/equipment, process losses, purchased electricity, and water usage and wastewater discharge (CARB, 2008c).

### **Local**

#### **Northern Sonoma County Air Pollution Control District (NSCAPCD)**

The air quality rules and regulations applicable to the North Coast Air Basin are set forth to achieve and maintain such levels of air quality as will protect human health and safety; prevent injury to plant and animal life; avoid damage to property; and preserve the comfort, convenience and enjoyment of the natural attractions of the North Coast Air Basin. It is the intent of all air districts in the North Coast Air Basin to adopt and enforce rules and regulations which assure that reasonable provision is made to achieve and maintain State and federal ambient air quality standards for the area under their jurisdiction and to enforce all applicable provisions of State law (NSCAPCD, 2010a).

#### **Sonoma County Community Climate Plan**

The Sonoma County Community Climate Plan was prepared to identify potential solutions to help the nine cities in Sonoma County achieve greenhouse gas reduction goals. The plan established greenhouse gas reduction targets and goals for major sectors including commercial, residential, transportation, and land use planning (Climate Protection Campaign, 2008).

### **Sonoma County**

Local policies established in the *Sonoma County General Plan 2020* that govern air resources in the Project Area are summarized in Section 4.10 in **Appendix 4.0, Local Regulatory Framework Governing Environmental Resources**.

## 4.10.4 Environmental Impacts and Mitigation Measures

### Significance Criteria

In accordance with Appendix G of the CEQA Guidelines, implementation of the Estuary Management Project would have significant impacts on air quality or related to GHG emissions if it would:

1. Conflict with or obstruct implementation of the applicable air quality plan;
2. Violate any air quality standard or contribute substantially to an existing or projected air quality violation;
3. Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is in non-attainment under a federal or State ambient air quality standard (including releasing emissions which exceed quantitative thresholds for ozone precursors);
4. Expose sensitive receptors to substantial pollutant concentrations;
5. Create objectionable odors affecting a substantial number of people;
6. Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment; or
7. Conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing the emissions of greenhouse gases.

There is no applicable air quality plan for the Estuary Management Project Area and the area is in attainment of all State and federal standards. There would be no potential that the Estuary Management Project would obstruct implementation of an applicable air quality plan, contribute to an existing air quality violation, or result in a cumulatively considerable net increase of a criteria pollutant that the area is in non-attainment of air quality standards. Therefore, there would be no impact associated with these issues and these issues are not addressed further in this EIR.

### Approach to Analysis

The NSCAPCD recommends that CEQA documents for projects within the district boundaries use specific thresholds to determine significance for NO<sub>x</sub>, ROG, CO, and PM<sub>10</sub>. The significance threshold for NO<sub>x</sub> and ROG is 40 tons per year, the significance threshold for CO is 100 tons per year, and the threshold for PM<sub>10</sub> is 15 tons per year (NSCAPCD, 2010b).

The NSCAPCD currently does not have adopted GHG thresholds of significance for CEQA review projects (NSCAPCD, 2010b). Therefore, to determine impacts associated with GHG emissions, the NSCAPCD recommends use of the Bay Area Air Quality Management District's approach to the determination of significance of GHG emissions based on the GHG significance threshold of 1,100 metric tons CO<sub>2</sub>e per year for projects that are not stationary sources, such as the Estuary Management Project.

To determine the criteria pollutant and GHG emission levels that would be associated with the Estuary Management Project, emission factors were derived using CARB's Offroad2007 and EMFAC2007 emissions software (ESA, 2010). Once the emission factors were determined, they were compared to the significance thresholds mentioned above.

As noted in **Chapter 2.0, Project Description**, the Water Agency would continue its current practice of artificial breaching outside of the lagoon management period of May 15 through October 15. Timing, implementation, access, sensitivity to pinniped haulout, personnel, equipment, and general procedures would be equivalent to current practices, as described in **Section 2.2.2**. No change to artificial breaching outside of the lagoon management period would occur under the Estuary Management Project.

## Impact Analysis

The following impact analysis focuses on potential impacts of the proposed Estuary Management Project related to air quality. The evaluation considered project plans, current conditions at the project site, and applicable regulations and guidelines. Impacts are summarized and categorized as either "no impact," "less than significant," "less than significant with mitigation," or "significant and unavoidable."

### **Impact 4.10.1: Criteria Pollutants. The Estuary Management Project would result in periodic emissions of criteria pollutants. (Less than Significant)**

The on-site equipment that would be required for the creation and maintenance of the outlet channel would be up to two pieces of heavy machinery on the beach, such as an excavator and/or bulldozer, and approximately four to five staff vehicles (typically small pick up trucks) to transport staff to the Goat Rock State Beach parking lot.

At the start of the lagoon management period, when configuring the outlet channel for the first time that year, the machinery would operate for up to two consecutive working days. As noted in **Chapter 2.0, Project Description**, the frequency of equipment operation on the barrier during the lagoon management period may be incrementally increased compared to existing conditions, and could include up to 18 maintenance activities over the course of the lagoon management period, depending upon the performance of the outlet channel. This represents a potential increase over existing artificial breaching activities.

To yield a conservative estimate of emissions on an annual basis for the Estuary Management Project, it was assumed that one excavator or bulldozer, each with a maximum horsepower of 500, would be used for eight hours a day<sup>4</sup>, 30 days a year. This represents a maximum conservative assumption; comprised of the maximum number of Agency breaching events that have occurred outside the lagoon management period (nine in 2009) plus initial outlet channel establishment, 18 maintenance events, and two contingency to account for emergency artificial breaches allowed under the Russian River Biological Opinion for imminent flood danger. Note

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<sup>4</sup> The Water Agency has not, and does not anticipate work days of this length; however eight hours is a common and conservative assumption.

that if the outlet channel functions as designed, less maintenance may be necessary, but 18 represents the maximum allowed under permit conditions. With regard to off-site emission sources, it is assumed that five small pickup truck trips would be required to transport Agency staff to the Project site up to 30 days a year. In addition, up to two semi-tractor vehicle trips would be needed for each outlet channel established, for a total of 60 trips per year. Vehicles and equipment would be staged at the Goat Rock State Beach north parking lot. For a conservative analysis, it is assumed that the approximate distance driven per round trip would be 64 miles, representing the round trip distance to the Estuary Management Project site from Santa Rosa.

**Table 4.10-4** presents the estimated criteria pollutant emissions that would be generated by on-site equipment and off-site vehicles that would be associated with the Estuary Management Project. Refer to **Appendix 2** for the emission factors and all other assumptions used to estimate the emissions. As indicated in the table, emissions of each of the criteria pollutants would be well under one ton and would be substantially less than the NSCAPCD significance criteria. Therefore, impacts associated with generation of criteria pollutants would be less than significant. It should be noted that the emissions presented in the table do not include those that would be associated with fugitive dust. Given the coarse and wet nature of the sediment that would be handled it is anticipated that fugitive dust emissions that would be associated with the Estuary Management Project would be negligible.

**TABLE 4.10-4  
 ESTIMATED PROJECT-GENERATED CRITERIA POLLUTANTS (tons per year)**

<b>Source</b>	<b>ROG</b>	<b>CO</b>	<b>NO<sub>x</sub></b>	<b>PM10</b>	<b>PM2.5</b>
On-Site Equipment	0.02	0.10	0.23	0.01	0.01
Off-Site Vehicles	<0.01	0.02	0.02	<0.01	<0.01
<b>Total (tons per year)</b>	<b>0.02</b>	<b>0.12</b>	<b>0.25</b>	<b>0.01</b>	<b>0.01</b>
Significance Threshold	40	100	40	15	---
Significant Impact?	No	No	No	No	No

**Impact Significance:** Less than Significant; no mitigation measures are required.

**Impact 4.10.2: Toxic Air Contaminants (TACs). The Estuary Management Project would result in emissions of TACs that could pose a health risk to sensitive receptors located in the project vicinity. (Less than Significant)**

The primary TAC of concern that would be associated with the Estuary Management Project would be diesel particulate matter (DPM) from the combustion of diesel fuel associated with operations of heavy equipment. Health risk associated with exposure to DPM is typically associated with chronic exposure, in which 70-year exposure duration is often assumed. It is anticipated that the proposed Estuary Management Project would consist of periodic activities for up to 11 days per year for artificial breaching and 18 days for outlet channel maintenance and the closest sensitive receptor (i.e., a residential property in Jenner) to the proposed Estuary Management Project would be

approximately 1,000 feet from barrier beach work area. At this distance and proposed level of project activities, DPM concentrations associated with Estuary Management Project would be negligible. Since health risks associated with DPM are generally associated with chronic exposure, it can be assumed that Estuary Management Project-related emissions would cause a negligible net increase in health risk, and impacts on nearby sensitive receptors would be less than significant.

**Impact Significance:** Less than Significant; no mitigation measures are required.

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**Impact 4.10.3: Objectionable Odors. The Estuary Management Project could create objectionable odors. (Less than Significant)**

Typical odor sources of concern include wastewater treatment plants, sanitary landfills, transfer stations, composting facilities, petroleum refineries, asphalt batch plants, chemical manufacturing facilities, fiberglass manufacturing facilities, auto body shops, rendering plants, and coffee roasting facilities. Given that Estuary Management Project would involve the periodic construction creation of a lagoon outlet channel at Estuary, the most prominent odor concern would be associated with diesel exhaust from heavy equipment activities. However, these odors would be temporary in nature and would not affect a substantial number of people given the long distance from the project site to the nearest sensitive receptors. The proposed project would not generate other odors, and odor-related impacts would be less than significant.

**Impact Significance:** Less than Significant; no mitigation measures are required.

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**Impact 4.10.4: Greenhouse Gas Emissions. The Estuary Management Project would result in the generation of GHG emissions. (Less than Significant)**

The NSCAPCD currently does not have adopted GHG thresholds of significance for CEQA review projects (NSCAPCD, 2010b). Therefore, as the lead agency for this project, the Water Agency has elected to use an approach for the determination of significance of GHG emissions based on the GHG significance thresholds adopted by the BAAQMD, which is 1,100 metric tons CO<sub>2</sub>e per year for projects that are not stationary sources. Given that the Estuary Management Project would result exclusively in construction equipment and vehicle-related emissions that are not stationary sources, the Water Agency believes that the BAAQMD's significance threshold for non-stationary source projects is the most applicable air district-adopted GHG significance threshold available.

**Table 4.10-5** presents the estimated GHG emissions that would be generated by on-site equipment and off-site vehicles that would be associated with the Estuary Management Project. The same project-related assumptions that were used to estimate the criteria pollutant emissions were used to estimate the GHG emissions. Refer to **Appendix 2** for the emission factors and all other assumptions used to estimate the GHG emissions. As indicated in the table, emissions of CO<sub>2</sub>e

would be well under the BAAQMD significance criterion. Therefore, impacts associated with generation of GHG emissions would be less than significant.

**TABLE 4.10-5  
 ESTIMATED PROJECT-GENERATED GREENHOUSE GAS EMISSIONS  
 (metric tons per year)**

Source	CO <sub>2</sub>	CH <sub>4</sub>	NO <sub>2</sub>	CO <sub>2</sub> e
On-Site Equipment	19.89	<0.01	<0.01	20.09
Off-Site Vehicles	7.85	<0.01	<0.01	7.92
<b>Total (metric tons per year)</b>				<b>28.01</b>
Significance Threshed				1,100
Significant Impact?				No

**Impact Significance:** Less than Significant; no mitigation measures are required.

**Impact 4.10.5: Conflict with Climate Action Plan. The Estuary Management Project could conflict with a plan designed to reduce GHG emissions. (Less than Significant)**

The Estuary Management Project would not conflict with the Sonoma County Community Climate Action Plan; therefore, the Estuary Management Project would not interfere with its implementation. Furthermore, it is assumed that the Estuary Management Project would not interfere with implementation of AB 32 because it would not conflict with the 44 Recommended Actions designed to achieve the 2020 GHG emissions limit required by AB 32 identified in CARB’s Climate Scoping Plan. Impacts would be less than significant.

**Impact Significance:** Less than Significant; no mitigation measures are required.

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