APPENDIX B

FINAL ENVIRONMENTAL ANALYSIS

FOR THE REVISED PROPOSED 2016 STATE STRATEGY FOR THE STATE IMPLEMENTATION PLAN

Air Resources Board

1001 I Street

Sacramento, CA 95814

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ACRONYMS AND ABBREVIATIONS

ug/m^3	micrograms per cubic meter
AB	Assembly Bill
ABAG	Association of Bay Area Governments
AMBAG	Association of Monterey Bay Area Governments
ACC	Advanced Clean Cars
~~ACT~~	~~Advanced Clean Transit~~
ADF	Alternative Diesel Fuel
APA	Administrative Procedure Act
APE	area of potential effect
AQIP	Air Quality Improvement Program
AQMP	Air Quality Management Plan
ARB or Board	California Air Resources Board
BAR	Bureau of Automotive Repair
BCAG	Butte County of Governments
BEV	Battery Electric Vehicle
BLM	U.S. Bureau of Land Management
BMP	best management practice
CAG	County Association of Governments
CAP	criteria air pollutant
CEQA	California Environmental Quality Act
CI	carbon intensity
COG	Council of Governments
CTC	County Transportation Commission
dBA	A-weighted decibel
EA	Environmental Analysis
EFMP	Enhanced Fleet Modernization Program
EIR	environmental impact reports
FAA	Federal Aviation Administration
FCEV	Fuel Cell Electric Vehicle
FIP	Federal implementation plan
FTA	Federal Transit Administration
g/bhp-hr	gram per brake horse power hour
gCO_2e/MJ	grams of carbon dioxide equivalent per megajoule
GHG	greenhouse gas
GSE	Ground Support Equipment
GWP	global warming potential

HDV	heavy-duty vehicle
ICT	Innovative Clean Transit
IMO	International Maritime Organization
in/sec	inch per second
LCFS	Low Carbon Fuel Standard
LDV	light-duty vehicle
Leq	equivalent level measurements
LEV	Low Emission Vehicle
Lmax	maximum sound level
LSI	Large Spark Ignition
MDV	medium-duty vehicle
MOU	memorandum of understanding
MPO	metropolitan planning organization
MT CO_2e	metric tons of carbon dioxide equivalent
NAAQS	national ambient air quality standards
NESCAUM	Northeast States for Coordinated Air Use Management
NOx	nitrogen dioxide
NPDES	National Pollutant Discharge Elimination System
ODS	ozone depleting substance
OBD	on board diagnostic
PEMS	portable emission measurement system
PHEV	plug-in hybrid electric vehicles
PM	particulate matter
PM10	respirable particulate matter
PM2.5	fine particulate matter (particles with an aerodynamic diameter less than or equal to a nominal 2.5 micrometers)
ppb	parts per billion
PPV	peak particle velocity
PRC	Public Resources Code
RTP	Regional Transportation Plan
ROG	reactive organic gases
SACOG	Sacramento Area Council of Governments
SAE	Society of Automotive Engineers
SB	Senate Bill
SBCAG	Santa Barbara County Association of Governments
SCAQMD	South Coast Air Quality Management District

SCAG	Southern California Association of Governments
SCS	Sustainable Communities Strategy
SIP	State Implementation Plan
SJCOG	San Joaquin Council of Governments
SLCP	Short-lived climate pollutants
SLOCOG	San Luis Obispo Council of Government
SORE	small off-road engines
SWPPP	stormwater pollution prevention plan
SRTA	Shasta Regional Transportation Agency
State SIP Strategy	Proposed 2016 State Strategy for the State Implementation Plan
TAC	toxic air contaminants
TEU	20-foot equivalent units
TCR	Tribal Cultural Resources
The Act	federal Clean Air Act
TMPO	Tahoe Metropolitan Planning Organization
TRPA	Tahoe Regional Planning Agency
TRU	transport refrigeration unit
U.S. EPA	U.S. Environmental Protection Agency
USGS	U.S. Geological Survey
VdB	vibration decibels
VMT	vehicle miles traveled
WSA	Water Supply Assessment
ZEV	zero-emission vehicle

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1.0 INTRODUCTION AND BACKGROUND

A. Introduction

This ~~Draft~~ Final Environmental Analysis (~~Draft~~ Final EA) is Appendix B to the Revised Proposed 2016 State Strategy for the State Implementation Plan (State SIP Strategy) that will be presented to the California Air Resources Board (ARB or the Board) for consideration on March 23 or 24, 2107. The State SIP Strategy is designed to reduce emissions of ozone-forming pollutants and fine particulate matter (PM2.5), and describe the programmatic and regulatory mechanisms of the federal Clean Air Act (the Act) requirements to meet federal air quality standards. This ~~Draft~~ Final EA evaluates the potentially significant environmental effects related to implementation of the strategy measures and their associated reasonably foreseeable compliance responses. In general, the proposed mitigation measures described in this document would be expected to reduce potentially significant impacts to less-than-significant levels at the project level, if agencies with mitigation implementation authority enforce the measures. This ~~Draft~~ Final EA takes the conservative approach in its post-mitigation significance conclusions (i.e., tending to overstate the risk that feasible mitigation may not be sufficient or may not be implemented by other parties) and discloses, for California Environmental Quality Act (CEQA) compliance purposes, that potentially significant environmental impacts may be unavoidable. It is expected that many of these potentially significant impacts can be feasibly avoided or mitigated to a less-than-significant level as described in each resource area as a result of the project-specific environmental review processes associated with compliance actions and as a result of compliance with local and state laws and regulations. Typical mitigation measures, described in each resource area, would be further developed during project-specific environmental review processes associated with compliance actions.

B. Purpose of the State SIP Strategy

The U.S. Environmental Protection Agency (U.S. EPA) is responsible for setting and regularly reviewing federal health-based ambient air quality standards for ground-level ozone, inhalable particulate matter (PM10 and PM2.5), carbon monoxide, oxides of nitrogen (NOx), and sulfur dioxide (see The Act §109; 42 U.S., Code [U.S.C.] § 7409). Based on research demonstrating adverse health effects at lower exposure levels, U.S. EPA has set a series of increasingly health protective air quality standards. ~~In response to new science demonstrating health impacts associated with lower concentrations, U.S. EPA has progressively strengthened the federal air quality standards.~~ In 2008, U.S. EPA revised the 8-hour ozone standard to 75 parts per billion (ppb), and in 2012, revised the annual PM2.5 standard to 12 micrograms per cubic meter ($\mu g/m^3$).

Statewide, about 12 million Californians live in communities that exceed the federal ozone and PM2.5 standards.

Sixteen areas in California are designated as nonattainment for the 75 ppb 8-hour ozone standard. They include California's large urban regions, as well as a number of rural downwind areas. Ozone nonattainment areas are classified according to the severity of their air pollution problem. Ozone nonattainment areas are classified according to the severity of their air pollution problem. Areas with higher pollution levels are given more time to meet the standard (attainment date), but are also subject to more stringent control requirements. The South Coast and San Joaquin Valley are the only two Extreme areas in the nation, with ~~an~~ attainment deadlines of 2031.

Four areas in California are designated as nonattainment for the 12 µg/m^3 annual PM2.5 standard. These include the South Coast and the San Joaquin Valley, as well as the border region of Imperial County and the City of Portola in Plumas County. While the PM2.5 challenges in the South Coast and the San Joaquin Valley are regional in nature, the Imperial County and Portola nonattainment areas reflect unique local conditions related to cross-border transport and wood smoke impacts, respectively. Separate, tailored control programs will be necessary for these two areas.

Under the Act, ARB and local air districts are responsible for developing and submitting to U.S. EPA clean air plans, known as SIPs (See the Act, § 110; 42 U.S.C. § 7410.) SIPs are comprehensive plans that demonstrate how and when nonattainment areas within California would reach attainment of air quality standards. SIPs must identify both the magnitude of emission reductions needed and the actions necessary to achieve those reductions by the required attainment deadline.

Developing the SIPs is an immediate focus of ARB's planning efforts~~, with regional plans for ozone nonattainment areas due in July 2016 and PM2.5 nonattainment areas in October 2016~~. In 2017, ARB will be considering SIPs to address the 8-hour ozone standard of 75 ppb and the annual PM2.5 standard of 12 micrograms per cubic meter (µg/m^3). Substantial emission reductions beyond those being achieved with current programs are needed to meet these standards. In addition to the most recent air quality standards, the South Coast and San Joaquin Valley must also continue to make progress towards attaining earlier standards they have not yet achieved, including the 8-hour ozone standard of 80 ppb, and the 24-hour PM2.5 standard of 35 µg/m^3.

The State SIP Strategy specifically outlines a series of ARB regulatory programs and actions that chart a course toward attainment of these standards by the attainment date. The regulatory programs and actions included in the State SIP Strategy (referred to as SIP measures) are designed to achieve significant emission reductions, and will be included in regional nonattainment area SIPs that will be submitted to U.S. EPA.

C. Scope of Analysis and Assumptions

The degree of specificity required in a CEQA document corresponds to the degree of specificity inherent in the underlying activity it evaluates. The environmental analysis for broad programs is necessarily less detailed than for specific projects (Cal. Code Regs., tit. 14, § 15146). For example, the assessment of a construction project would be more

detailed than for the adoption of a plan because the construction effects can be predicted with a greater degree of accuracy (Cal. Code Regs., tit. 14, § 15146 (a)).

The level of detail in this ~~Draft~~ Final EA reflects that the State SIP Strategy is a broad program; consequently, the analysis does not provide the level of detail that will be provided in subsequent environmental documents prepared for specific regulatory actions that ARB or other agencies may decide to pursue to reduce criteria air pollutant (CAP) emissions (Cal. Code Regs., tit. 14, § 15152.) As ARB pursues regulations to implement any of the measures discussed in the State SIP Strategy, each regulation would go through a project-specific environmental analysis, and, as part of the Administrative Procedure Act (APA) process, a rigorous public review process. The Initial Statement of Reasons prepared for each proposed ARB regulation, also known as the Staff Report, would include a project-specific Environmental Analysis ~~EA~~. Air pollution control districts are also subject to the APA and CEQA when developing regulations, and to CEQA when developing SIP measures that are submitted to ARB for approval and then to U.S. EPA.

This ~~Draft~~ Final EA provides a good-faith effort to evaluate the potential for significant adverse impacts associated with the reasonably foreseeable compliance responses that appear most likely to occur based on currently available information if the recommended actions identified in the State SIP Strategy are implemented. The ~~Draft~~ Final EA is a rigorous effort to evaluate reasonably foreseeable significant adverse impacts and beneficial impacts of the State SIP Strategy and contains as much information about those impacts as is currently available, without being speculative.

The scope of analysis in this ~~Draft~~ Final EA is intended to help focus public review and comments on the State SIP Strategy, and ultimately to inform the Board of the environmental benefits and adverse impacts prior to Board action on the proposals. This analysis specifically focuses on reasonably foreseeable potentially significant adverse and beneficial impacts on the physical environment resulting from reasonably foreseeable compliance responses taken in response to implementation of the measures within the State SIP Strategy.

The analysis of potentially significant adverse environmental impacts from the State SIP Strategy is based on the following assumptions:

1. This analysis addresses the potentially significant adverse environmental impacts resulting from implementing the State SIP Strategy compared to existing conditions.

2. The analysis of environmental impacts and determinations of significance are based on reasonably foreseeable compliance responses that would occur as a result of implementation of the measures within the State SIP Strategy.

3. The analysis in this ~~Draft~~ Final EA addresses environmental impacts both within California and outside the State to the extent they are reasonably foreseeable and do not require speculation.

4. The level of detail of impact analysis is necessarily and appropriately general, because the State SIP Strategy is a strategy and is itself programmatic. Furthermore, decisions by entities regarding the specific location and design of new facilities that may be undertaken in response to implementation of measures within the State SIP Strategy are speculative, if not impossible, to predict with precision at this stage given the lack of specificity of implementation of the specific measures, the unknown nature of new facilities that may be proposed, the influence of other business and market considerations in those decisions, and the numerous locations where such facilities might be built. Specific development projects undertaken in response to specific measures to implement the State SIP Strategy would undergo required project level environmental review and compliance processes at the time they are proposed.

5. This ~~Draft~~ Final EA generally does not analyze site-specific impacts when the location of future facilities or other infrastructure is speculative. ~~H~~However, the ~~Draft~~ Final EA does examine regional (e.g., air basin) and local issues to the degree feasible where appropriate. As a result, the impact conclusions in the resource-oriented sections of Chapter 4, Impact Analysis and Mitigation Measures, cover broad types of impacts, considering the potential effects of the full range of reasonably foreseeable actions undertaken in response to the State SIP Strategy.

D. Organization of the Environmental Analysis

The ~~Draft~~ Final EA is organized into the following chapters to assist the reader in obtaining information about the State SIP Strategy and their specific environmental issues.

- Chapter 1, Introduction and Background – provides a project overview, background information, and other introductory material.
- Chapter 2, Project Description – summarizes the State SIP Strategy, implementation assumptions, and reasonably foreseeable compliance responses taken in response to the State SIP Strategy.
- Chapter 3, Environmental and Regulatory Setting, in combination with Attachment 1 – contains the environmental setting and regulatory framework relevant to the environmental analysis of the State SIP Strategy.
- Chapter 4, Impact Analysis and Mitigation – identifies the potential environmental impacts associated with the State SIP Strategy and any appropriate mitigation measures for each resource impact area.

- Chapter 5, Cumulative and Growth-Inducing Impacts – identifies the cumulative effects of implementing the State SIP Strategy against a backdrop of past, present, and reasonably foreseeable future projects.
- Chapter 6, Mandatory Findings of Significance – discusses whether the State SIP Strategy would require any mandatory findings of significance, including consideration of whether the project has the potential to substantially degrade the quality of the environment, cause substantial adverse impacts on human beings, or cause cumulatively considerable environmental impacts.
- Chapter 7, Alternatives Analysis – discusses a reasonable range of potentially feasible alternatives that could reduce or eliminate adverse environmental impacts associated with the State SIP Strategy.
- Chapter 8, References – identifies sources of information used in this ~~Draft~~ Final EA.

E. Environmental Review Process

1. Requirements under the California Air Resources Board Certified Regulatory Program

ARB is the lead agency for the State SIP Strategy and has prepared this ~~Draft~~ Final EA pursuant to its CEQA certified regulatory program. CEQA, in Public Resources Code (PRC) Section 21080.5, allows public agencies with regulatory programs to prepare a "functionally equivalent" or substitute document in lieu of an environmental impact report (EIR) or negative declaration once the program has been certified by the Secretary for Resources Agency as meeting the requirements of CEQA. ARB's regulatory program was certified by the Secretary of the Resources Agency in 1978 (see Cal. Code Regs., tit. 14, § 15251 (d)). As required by ARB's certified regulatory program, and the policy and substantive requirements of CEQA, ARB has prepared this ~~Draft~~ Final EA to assess the potential for significant adverse and beneficial environmental impacts associated with the proposed actions and to provide a succinct analysis of those impacts (see Cal. Code Regs., tit.17, § 60005(a) and (b)). The resource areas from the CEQA Guidelines (Cal. Code Regs., tit. 14, § 15000 et seq.) Environmental Checklist (Appendix G) were used as a framework for assessing potentially significant impacts.

ARB has determined that approval of the State SIP Strategy is a "project" as defined by CEQA. A project is, "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, and that is … an activity directly undertaken by any public agency (Cal. Code Regs., tit. 14, § 15378 (a))." Although the policy aspects of the State SIP Strategy do not directly change the physical environment, physical changes to the environment could result from reasonably foreseeable compliance responses taken as a result of implementation of the measures identified in the State SIP Strategy.

2. Public Review Process for the Environmental Analysis

In October 2015, ARB staff released a discussion draft Mobile Source Strategy,[1] which specifically outlined~~s~~ a coordinated suite of proposed actions to not only meet federal air quality standards, but also achieve greenhouse gas emission reduction targets, reduce petroleum consumption, and decrease health risk from transportation emissions. The interconnected nature of strategies to meet all of ARB's goals has fostered an integrated planning approach that demonstrates the need for a comprehensive transformation to cleaner vehicle technologies, fuels, and energy sources. The Mobile Source Strategy provides a framework to support multiple planning efforts. The measures included in the State SIP Strategy represent the elements of the Mobile Source Strategy necessary to meet Clean Air Act requirements. In conjunction with the mobile source measures included in the State SIP Strategy, it also includes a measure to reduce Reactive Organic Gas (ROG) emissions from consumer products, a significant source of ROG emissions in the State.

ARB staff provided the Board with an informational briefing on the Mobile Source Strategy Discussion Draft at the October 2015 Board meeting in Diamond Bar. A public workshop was also held on October 16, 2015 in Sacramento, in which staff described plans to prepare a Draft EA and invited public feedback on the scope of analysis. Through coordination with stakeholders, the SIP-related measure concepts described in the Mobile Source Strategy Discussion Draft formed the basis of the State SIP Strategy. In accordance with ARB's certified regulatory program, and consistent with ARB's commitment to public review and input on its proposed actions, this ~~Draft~~ Final EA is subject to a public review process through the posting of the Proposed 2016 State SIP Strategy and ~~this~~ its Draft EA for a public review period that ~~begins~~ began on May 17, 2016 and ~~ends~~ ended on July 18, 2016.

~~At the~~ Upon conclusion of the public review period, ARB ~~will~~ staff prepared written responses to environmental comments received on the Draft EA and has ~~make~~ made revisions, as necessary to the Draft EA, which are reflected in this Final EA. ~~The~~ Together with the Revised Proposed 2106 State SIP Strategy, this Final EA and the written responses to environmental comments will be considered by the Board at a public hearing that is ~~expecting~~ expected to be held in ~~September~~ March ~~2016~~2017. If the State SIP Strategy is approved, a Notice of Decision will be posted on ARB's website and filed with the Secretary for Natural Resources (Cal. Code Regs., tit. 17, § 60007 (b)). The Notice of Decision will also be filed with the State Clearinghouse.

[1] 2016 Mobile Source Strategy https://www.arb.ca.gov/planning/sip/2016sip/2016mobsrc.htm

2.0 PROJECT DESCRIPTION

A. Introduction

For purposes of this ~~Draft~~ Final EA, the "project" is defined as the measures described in the Revised Proposed 2016 State Strategy for the State Implementation Plan, hereby incorporated by reference, which would result in emission reductions to meet air quality standards over the next 15 years and support planning efforts for non-attainment areas throughout the State. The measures are a required component of California's SIP, prepared pursuant to the federal Clean Air Act (The Act). A summary of these measures is provided in this section; for a more detailed description please refer to the Revised Proposed 2016 State SIP Strategy, available at:

https://www.arb.ca.gov/planning/sip/2016sip/2016sip.htm

The State SIP Strategy would reduce emissions of PM2.5 ~~ozone~~ and ozone ~~PM2.5~~ precursors, including ~~emissions of~~ ROG emissions from consumer products and ROG and NOx from mobile sources. Through a combination of regulatory and programmatic actions over the next 15 years, the State SIP Strategy would:

- Establish more stringent engine performance standards for cleaner combustion technologies;
- Ensure that emissions control systems remain durable over the lifetime of the vehicle;
- Increase the penetration of near-zero and zero-emission vehicle (ZEV) technology across a range of applications;
- Expand the requirements for cleaner Low-Emission Diesel (LED) fuels;
- Conduct pilot studies to demonstrate new technologies;
- Incentivize the turnover of equipment and fleets to the cleanest technologies;
- Increase system efficiencies; and
- Reduce emissions from consumer products.

The proposed measures contained in the State SIP Strategy reflect the maturity of current control programs for each ~~category of~~ mobile source sector (i.e. on-road light-duty vehicles, on-road heavy-duty vehicles [HDV], off-road federal and international sources, and off-road equipment), as well as the nature of further technology deployment needed.

For light-duty vehicles, ~~the need~~ actions to significantly increase the penetration of current ZEV technology and encourage advancements in battery range, hydrogen technology and fueling infrastructure will be implemented through the Advanced Clean Cars 2 (ACC 2) measure, along with an ongoing in-use performance assessment and incentive funding to ~~expand~~ increase the ~~deployment~~ penetration of cleaner passenger vehicles through accelerated deployment.

In the heavy-duty sector, while ARB's current Truck and Bus Regulation is ensuring that the in-use fleet consists of the cleanest engines currently available, combined ARB and federal action is needed to develop a more stringent low-NOx engine standard and to move towards even cleaner combustion technologies. Parallel measures would require deployment of the cleanest available near-zero and zero-emission ~~and cleaner combustion~~ technologies in ~~initial~~ applications with duty-cycles that are well-suited to the first wave of heavy-duty ZEV technology, such as last mile delivery vehicles, airport shuttle buses, and ~~urban~~ transit ~~buses~~ options. Finally, given the long lifetime of heavy-duty trucks, further incentive funding will be critical to achieve greater fleet turnover, especially within the 2023 timeframe.

Similar actions will be necessary in the off-road sector, with a focus on further federal and international actions to reduce emissions from these sources, particularly as they ~~that~~ are projected to ~~become~~ represent an increasing portion of the emission inventory in future years. ~~Measures~~ Proposed measures include a petition for new more stringent national emissions standards for locomotives, as well as advocacy for international Tier 4 ~~vessel~~ standards for Ocean-Going Vessels. The remaining off-road equipment categories provide an opportunity to introduce ~~zero and~~ near-zero and zero-~~advanced~~ emission technologies, with measures to initially deploy near-zero and ~~zero~~ zero-emission technologies ~~for~~ in applications that are well-suited for their use, including transport refrigeration units and airport ground support equipment. Proposed measures also call for ~~and~~ continued evaluation of ~~technology~~ the potential for transferring advanced near-zero and zero-emission ~~of cleaner~~ on-road technologies to heavier off-road categories. To achieve further emission reductions from vehicles and equipment still using combustion technologies, ~~Coupled with~~ these efforts ~~is~~ are complimented by a proposed measure calling for a Low-Emission Diesel requirement.

Due to the severity of the South Coast's ozone challenge, each mobile source sector ~~(on-road light-duty vehicles, on-road heavy-duty vehicles [HDVs], off-road federal and international sources, and off-road equipment)~~ also includes a measure that reflects the region's need for enhanced deployment of cleaner on- and off-road technologies ~~in extreme nonattainment areas such as the South Coast~~. Recognizing the benefits and opportunities for enhancing the penetration of these technologies, the State SIP Strategy includes a proposed commitment for additional emission reductions as part of the Further Deployment of Cleaner Technologies measures, which are designed to target the remaining emission reductions needed for attainment.

For these Further Deployment measures, ARB staff proposes to achieve emission reductions through the types of approaches described in more detail within the State SIP Strategy. These further deployment measures will rely on: expanded incentive funding; programs to accelerate near-zero and zero-emission technology deployment; efforts to increase system efficiencies and reduce passenger vehicle miles traveled (VMT); and potentially further regulatory actions. In some cases, actions by local, federal, and international agencies are necessary. In others, programmatic approaches must be developed and funding secured to achieve the reductions outlined in the

Further Deployment of Cleaner Technologies measures. The actions called for in the proposed Further Deployment measures reflect the importance of a variety of tools and approaches to achieve emission reductions through a comprehensive transformation of the transportation system. Building from the core regulatory efforts, implementing the complementary actions to support this transformation will include: 1) efforts to enhance the penetration of cleaner technologies through incentive programs and other funding mechanisms; 2) advocacy for further federal actions; 3) further regulatory development as new technologies emerge; 4) quantification of the benefits of increased system efficiencies, utilization of intelligent transportation systems and emerging autonomous and connected vehicle technologies; and 5) other innovative efforts to incentivize the demand for cleaner technologies. Specific examples ~~The actions called for in the Further Deployment of Cleaner Technologies measures~~ include:

- Incentive programs to further accelerate technology penetration. Existing incentive programs, ranging from the original Carl Moyer Program through the Low-Carbon Transportation investments with Cap-and-Trade proceeds, provide a programmatic structure. However, resources beyond those currently available would be required to achieve needed reductions.
- Increased efficiency in moving people and freight. The Sustainable Communities and Climate Protection Act of 2008 (Senate Bill [SB] 375) is helping to transform land use and promote sustainability, while focusing on reducing vehicle miles traveled. State agencies are also looking for strategies to incentivize greater freight transport system efficiencies through the California Sustainable Freight Action Plan.
- Transportation technologies, such as intelligent transportation systems and autonomous and connected vehicles, have the potential to fundamentally transform the transportation system to improve efficiency, safety, and air emissions.
- Several of the near-term measure concepts in the off-road sector are designed to identify the appropriate next steps in further deploying zero-emission technologies. While emission reductions are not yet associated with these measure concepts, the outcome of the assessments would provide a mechanism to identify specific regulatory approaches and the associated emission reductions.
- Further federal actions, including support for demonstration programs, and supporting policies to achieve reductions from sources under federal and international regulatory authority.

Additional discussion of overall approaches is provided below, with individual pathways described as part of the Further Deployment of Cleaner Technologies measure write-ups for each sector contained in Chapter 4 of the Revised Proposed State SIP Strategy. It is ~~also~~ important to note that some of the actions described in the Further Deployment of Cleaner Technologies measures are already occurring under a business-as-usual scenario, outside of the SIP-related actions analyzed in this document — namely, actions to advance intelligent, autonomous, and connected

vehicle technologies, and actions to reduce VMT through activities called for under SB 375. For that reason, while they may generate reductions that contribute to attaining federal air quality standards, actions to reduce VMT, and to deploy intelligent, autonomous, and connected vehicle technologies, are not further analyzed in this document.

The State SIP Strategy also includes a measure designed to further reduce emissions of ROG, an ozone precursor, from consumer products. To reduce ROG emissions while providing industry with additional flexibility, ARB staff would identify strategies to achieve emission reductions, and may investigate opportunities to establish alternative compliance options to provide flexibility to industry to comply with regulations, such as an emission "bubble", or cap to reduce ROG emissions from consumer products. The proposed measure may involve establishing new ROG limits for categories currently unregulated and/or lowering ROG limits for categories already regulated. To identify categories of consumer products for rulemaking, staff may consider both mass and reactivity of category emissions.

The measures as proposed by staff or adopted by the Board may provide more or less reductions than the amount shown. ARB's emission reduction commitments may be achieved through a combination of actions including but not limited to the implementation of control measures; the expenditure of local, State or federal incentive funds; or through other enforceable measures. The Act includes a provision for approval under Section 182(e)(5) to allow this future flexibility for Extreme areas such as the South Coast needing additional reductions to meet the ozone standard.

The proposed measures and the reasonably foreseeable compliance responses are described in further detail in Section C.

B. Project Objectives

The objectives of the State SIP Strategy are to:

1. Provide the necessary emission reductions for all of California's nonattainment areas to meet federal ambient air quality standards by the attainment dates specified by U.S. EPA, including the 75 ppb ground level ozone standard and the annual PM2.5 standard of 12 $\mu g/m^3$;

2. Support the development and submittal of an approvable SIP to U.S. EPA. To meet U.S. EPA requirements for approvable SIPs, the measures must include commitments to achieve emission reductions that are real, permanent, quantifiable, verifiable, and enforceable;

3. Complement existing programs and plans – to ensure, to the extent feasible, that activities undertaken pursuant to the measures complement, and do not interfere with, existing planning efforts to reduce greenhouse gas (GHG) emissions, use of petroleum-based transportation fuels, and toxic air contaminant (TAC) emissions;

4. Incentivize and support emerging technology that will be needed to achieve ARB's SIP goals;

5. Establish requirements for cleaner technologies (both zero and near-zero emission technologies), coupled with cleaner renewable fuels to achieve ARB's SIP goals;

6. Introduce zero-emission technology in targeted applications to achieve ARB's SIP goals;

7. Ensure the in-use vehicle and engine fleets remain durable, and that in-use vehicles continue to operate at their cleanest possible level to achieve ARB's SIP goals; and

8. Incentivize early introduction of advanced clean technologies to achieve ARB's SIP goals.

C. Plan Concepts and Reasonably Foreseeable Compliance Responses

A summary is provided below of the State SIP Strategy measures and the associated reasonably foreseeable compliance responses. Table 2-1 provides a list of each measure, the implementing agency, and the proposed implementation schedule. For measures implemented by federal agencies, ARB will submit petitions to U.S. EPA requesting federal action; however, ARB would not have any authority to determine whether to implement the associated actions or how those actions are designed.

The anticipated compliance responses to various measures discussed in this section focus on those activities under ARB's control with the potential to result in either a direct or indirect physical change in the environment. These include such things as construction activities, infrastructure and equipment installations, and substantial operational changes to facilities. Some potential compliance responses are activities that would not result in environmental effects (e.g., recordkeeping). Such activities are noted in the discussion below, but otherwise include no further analysis. The environmental impacts of the reasonably foreseeable compliance responses are discussed in Chapter 4, Impact Analysis and Mitigation.

Table 2-1: Proposed New SIP Measures and Schedule

Proposed Measures	Agency	Action	Implementation Begins
On-Road Light-Duty			
Advanced Clean Cars 2	ARB	2020 – 2021	2026
Lower In-Use Emission Performance Assessment	ARB / BAR	n/a	ongoing
Further Deployment of Cleaner Technologies*	ARB / SCAQMD	ongoing	2016
On-Road Heavy-Duty			
Lower In-Use Emission Performance Level	ARB	~~2018~~2017 – 2020	~~2017~~ 2018 +
Low-NOx Engine Standard – California Action	ARB	~~2017 –~~ 2019	2023
Low-NOx Engine Standard – Federal Action*	U.S. EPA	~~2017 –~~ 2019	2024
Medium and Heavy-Duty GHG Phase 2	ARB / U.S. EPA	~~2016~~ 2017 – 2019	2018
~~Advanced~~ Innovative Clean Transit	ARB	2017	2018
Last Mile Delivery	ARB	2018	2020
Innovative Technology Certification Flexibility	ARB	2016	~~2016~~ 2017
Zero-Emission Airport Shuttle Buses	ARB	2018	2023
Incentive Funding to Achieve Further Emission Reductions from Heavy-Duty Vehicles	ARB / SCAQMD	ongoing	2016
Further Deployment of Cleaner Technologies*	ARB / SCAQMD	ongoing	2016
Off-Road Federal and International Sources			
More Stringent National Locomotive Emission Standards*	U.S. EPA	2016	2023
Tier 4 Vessel Standards*	ARB / IMO	~~2015~~ 2016 – 2018	2025
Incentivize Low Emission Efficient Ship Visits	ARB	~~2017 - 2018~~ 2018 – 2020	2018
At-Berth Regulation Amendments	ARB	2017 – 2018	~~2022~~ 2023
Further Deployment of Cleaner Technologies*	ARB / SCAQMD / U.S. EPA	ongoing	2016
Off-Road Equipment			
Zero-Emission Off-Road Forklift Regulation Phase 1	ARB	2020	2023
Zero-Emission Off-Road Emission Reduction Assessment	ARB	2025 +	--
Zero-Emission Off-Road Worksite Emission Reduction Assessment	ARB	tbd	--
Zero-Emission Airport Ground Support Equipment	ARB	2018	2023
Small Off-Road Engines	ARB	2018	2022
Transport Refrigeration Units Used for Cold Storage	ARB	~~2017 - 2018~~ 2018 – 2019	2020 +
Low-Emission Diesel Requirement	ARB	by 2020	2023
Further Deployment of Cleaner Technologies*	ARB / SCAQMD	ongoing	2016
Consumer Products			
Consumer Products Program	ARB	2019 – 2021	2020 +

BAR=Bureau of Automotive Repair; IMO=International Maritime Organization; SCAQMD=South Coast Air Quality Management District, U.S. EPA = U.S. Environmental Protection Agency

***** Request U.S. EPA approval under the provisions of Section 182(e)(5) of the Clean Air Act allowing for reliance on anticipated development of ne control techniques or improvement of existing control technologies. Also includes identification of needed funding, infrastructure development, and actions/resources required from other agencies

The proposed measures reduce emissions from six source categories:

1. On-Road Light-Duty Vehicles;
2. On-Road Heavy-Duty Vehicles;
3. Off-Road Federal and International Sources;
4. Off-Road Equipment;
5. Fuels; and
6. Consumer Products.

Below is a summary of the measures under each topic area along with the reasonably foreseeable compliance responses, which are used to evaluate the environmental impacts. A brief overall summary of the compliance responses is provided in Section D.

1. On-Road Light-Duty

The on-road light-duty transportation sector includes light-duty vehicles (LDVs) such as passenger cars, minivans, most sport utility vehicles and pickup trucks, and motorcycles.

a) Advanced Clean Cars 2

i. Measure Summary

This measure consists of new regulations or regulatory amendments to ensure that near-zero and ~~near-zero~~ zero-emission technology options continue to be commercially available, with electric driving range improvements to address consumer preferences ~~for greater ease of use~~ and to maximize electric vehicle miles traveled (eVMT). ARB would consider expanded California-specific standards for new light-duty vehicles to increase the number of new ZEVs and Plug-In Hybrid Electric Vehicles (PHEVs) sold in California, and increase the stringency of fleet-wide emission standards.

ii. Potential Compliance Responses

Reasonably foreseeable compliance responses under ~~ACC 2~~this measure could include an increase in demand for lithium ion batteries, which could require an increase in manufacturing facilities and associated increases in lithium mining and exports from countries with raw mineral supplies (e.g., Peru, South Africa, and China). The U.S. is also a source for lithium (e.g., a mining operation currently exists in Nevada). Disposal of any portion of vehicles, including batteries, would be subject to, and be in compliance with existing laws and regulations governing solid waste, such as California's Universal Waste Rule (Cal. Code Regs., tit. 22, Chapter 23). That is, disposal of used batteries into landfills is prohibited; however, they could be refurbished or re-used. To meet an increased demand of refurbishing or reusing batteries, new facilities, or modifications to existing facilities, are anticipated to accommodate battery recycling activities.

ACC 2 could also result in the development of new infrastructure in the form of hydrogen refueling stations and electric vehicle charging stations, which would increase as the share of ZEVs grows over time beyond 2025, compared to what would otherwise be anticipated under existing regulations. It is expected that manufacturing needs for new vehicles would largely be met by the existing market, and no new infrastructure or plants would be required.

b) Lower In-Use Emission Performance Assessment

i. Measure Summary

This measure would ensure that in-use vehicles continue to operate at their cleanest possible level. This measure calls for ARB and the California Bureau of Automotive Repair (BAR) to perform a comprehensive evaluation of ~~evaluate~~ California's in-use performance-focused inspection and maintenance procedures for LDVs and medium-duty vehicles (MDVs) and, if necessary, make improvements to ~~further~~ increase the program's effectiveness. ARB would conduct a study to further evaluate California's in-use performance inspection procedures through analysis of the Smog Check database and vehicle sampling obtained through ~~the California Bureau of Automotive Repairs (~~BAR's~~)~~ Random Roadside Inspection Program. Comparison of test results from the fleet at the time Smog Check inspections take place with roadside inspections conducted at random times in between Smog Check inspections would allow for analysis of Smog Check station performance, repair durability, the real-world performance of on-board diagnostic (OBD) systems in detecting emission-related problems, and other factors that impact the emission benefits provided by the program. Further investigation and analysis of in-use vehicles at the ARB Haagen-Smit Laboratory would be conducted as needed based on the preliminary findings of roadside data. Results from the study could be used to improve inspection test procedures, address program fraud, improve the effectiveness and durability of emission-related repair work, and to improve the regulations governing the design of OBD performance systems on motor vehicles to the extent necessary.

ii. Potential Compliance Responses

Reasonably foreseeable compliance responses under this measure would include technical studies that include new and existing testing procedures in the facilities noted above, as well as analysis of on-road data collected through existing Smog Check and Random Roadside Inspection programs pursuant to existing regulations. Some minor facility modifications or new equipment purchases could be required for expanded roadside testing, as determined by the BAR.

c) Further Deployment of Cleaner Technologies: On-Road Light Duty Vehicles

i. Measure Summary

This measure is designed to achieve further emission reductions for South Coast ~~Air Basin~~ attainment in 2023 and 2031 through a suite of actions to be undertaken by ARB and the South Coast Air Quality Management District (SCAQMD) to accelerate the penetration of ~~advanced~~ near-zero and zero-emission technologies. Should other Air Districts need to implement this measure to achieve further emission reductions in order to attain the ozone standards, ARB would also work with those districts to implement this measure.

~~The existing ACC regulation brings together a suite of regulations, including the Low Emission Vehicle (LEV) III standards and the ZEV regulation. To achieve t~~ The ~~further~~ emission reductions associated with ~~early penetration of the zero and near- zero-vehicle technologies established under this regulation~~ this proposed measure would be achieved through a combination of actions to be undertaken by both ARB and the South Coast. These actions reflect an initial assessment of a pathway, recognizing that as funding is allocated and advanced technologies further develop, the balance amongst approaches will necessarily adjust.

The Advanced Clean Cars regulation brings together a suite of regulations, including the LEV III standards and the ZEV regulation. To achieve the further reductions associated with early penetration of the near-zero and zero vehicle technologies established under the ZEV regulation, ARB and South Coast staff preliminarily estimated that approximately 500,000 to 600,000 passenger cars and trucks would need to be turned over to a model year vehicle meeting the currently applicable LEV III emissions standard or advanced hybrid or zero-emission technology by 2023, although this vehicle estimate may vary. The following mechanisms would provide a pathway for achieving this scale of technology deployment:

- Expand and enhance existing incentive and other innovative funding programs for LDVs in order to accelerate the turn-over of older vehicles with replacement to vehicles meeting a LEV III or better emissions level. Assuming incentive funding is the primary mechanism to achieve the scope of further technology deployment described above; preliminary estimates show that funding could be required for approximately 70,000 to 85,000 vehicles per year over a seven (7) year period, though these numbers are subject to change. The incentive funding required for this effort would go beyond the amount currently authorized for existing programs through 2023. This effort could expand upon the current Enhanced Fleet Modernization Program (EFMP) and EFMP Plus-Up, and include increasing the use of these vehicles in underserved communities and by lower-income consumers. Continued incentive funding post-2023

to further accelerate the deployment of ZEVs would provide additional reductions for 2031.

Determination of the needed resources would be based on assessment of the incremental cost of technologies and the type of funding mechanism employed. Funding needs and mechanisms would be identified, working in collaboration with SCAQMD and other State agencies.

- Continue to support infrastructure investment programs with the California Energy Commission (CEC) to maximize the use of electric vehicles through expanding charging stations and hydrogen fueling networks.

- Expand upon consumer awareness and education campaigns for electric vehicles. Awareness in California is currently low and outreach efforts are critical to ensure new car buyers understand ZEVs are available and offer benefits. In addition to ARB's current DriveClean education website, new campaigns are being launched by the PEV Collaborative, electric utilities, and automakers. ARB also supports national efforts by the U.S. DOE and Northeast States for Coordinated Air Use Management (NESCAUM).

ii. Potential Compliance Responses

Reasonably foreseeable compliance responses under this ~~specific action~~ measure would include increased use of near-zero and ~~ZEVs~~ zero-emission vehicles, associated changes in manufacturing, and increased infrastructure for hydrogen refueling and charging, similar to the compliance responses already described above under the ACC 2 measure. Fleet turnover may result in recycling or scrapping of old vehicles, or selling vehicles to areas outside of California.

2. On-Road Heavy-Duty

The on-road HDVs sector includes heavy-duty gas and diesel trucks, urban and school buses, and motorhomes. The heavy-duty sector is diverse, with many different technologies and approaches that could achieve emissions reductions. Heavy-duty trucks that operate in California travel long distances with about 60 percent of the trucks originating from out-of-state. Some trucks, however, are part of local fleets with centralized fueling that operate in shorter distances.

a) Lower In-Use Emission Performance Level

i. Measure Summary

This measure would ensure that in-use heavy-duty vehicles continue to operate at their cleanest possible level. ~~consists of regulations that~~ ARB staff would develop and propose new, supplemental actions, in the form of regulatory amendments or new regulations, to address in-use emission compliance, and to decrease engine

deterioration and improve efficiency. Thise suite of actions would include: amendments to ARB's existing Periodic Smoke Inspection and Heavy-Duty Vehicle Inspection Programs to revise the current opacity limit and make other program improvements; amendments to warranty and useful life provisions; amendments to the durability demonstration provisions within the certification requirements for heavy-duty engines; amendments to the NTE supplemental test procedures for heavy-duty diesel engines; and a comprehensive heavy-duty vehicle inspection and maintenance program. . This would give ARB the means to conduct comprehensive in-use compliance testing in a timely, practical, and cost-effective manner. ARB would likely collaborate with several partner states to reduce the occurrence and frequency of vehicles traveling in California.

ii. Potential Compliance Responses

Reasonably foreseeable compliance responses under this action measure could include the need to either modify existing light-duty testing centers or construct new testing centers, in order to facilitate a new "smog check" program for heavy-duty trucks.

b) Low-NOx Engine Standard

i. Measure Summary

The goal of this proposed measure is to introduce near-zero emission engine technologies that will substantially lower NOx emissions from on-road heavy-duty vehicles. ARB would begin developing a new heavy-duty low-NOx emission standard for in California, with in 2017, expected to be presented to the Board for consideration in action expected in 2019,. ARB staff will coordinate as much as possible with and petition U.S. EPA and urge U.S. EPA to establish develop a similar federal low-NOx emission standard.s for heavy-duty engines. The goal of this measure is to introduce near-zero emission engine technologies that would substantially lower NOx emissions from on-road HDVs. .

ARB would move forward with development of a new California-only Low-NOx standard regardless of U.S. EPA's decision to initiate a rulemaking for a federal Low-NOx standard. Regulation implementation is anticipated to occur between 2023 and 2027. If approved, a California-only low NOx standard would apply to all vehicles with new heavy-duty engines sold in California starting in 2023. However, the dynamics of the heavy-duty market means that this approach would not achieve the full benefit of the emission reductions that could be realized through a federal program. Due to the preponderance of interstate trucking's contribution to emissions in California, timely federal action to implement a national low-NOx engine standard is critical to provide the emission reductions needed for attainment.

If U.S. EPA establishes a similarly stringent national low-NOx standard, federal implementation would be expected to align with California's standard. Under such a

scenario, to ensure regulatory consistency, ARB would harmonize with U.S. EPA's program.

A Federal low-NOx standards could apply to all new heavy-duty trucks sold nationwide starting in 2023 2024 or later. In order to achieve the maximum emission reductions from this measure, a national standard would be necessary. This would This would ensure that all trucks traveling within California would eventually be equipped with an engine meeting the low-NOx standard. Without f Federal action is critical to implement this emission standard, fewer since emissions reductions from a California-only standard would occur because the reductions would come mostly from Class 2b-6 vehicles, (as most Class 7 and 8 vehicles (– i.e. trucks with a gross vehicle weight rating above 26,000 pounds) operating in California are originally purchased outside the State). In order to achieve the maximum emission reductions from this proposed measure, a federal standard is necessary.

ii. Potential Compliance Responses

The actions involved in federal (i.e. U.S. EPA) rulemaking activities are beyond ARB's control, since ARB lacks the authority to implement or design the federal low-NOx standard. It would therefore be speculative for this Draft Final EA to attempt to analyze the impacts of potential compliance responses associated with the federal measure. since ARB lacks the authority to implement or design the federal low-NOx standard. Note that I If U.S. EPA undertakes these federal rulemaking actions, U.S. EPA would complete the appropriate environmental analysis at the federal level.

Reasonably foreseeable compliance responses associated with under the a new California-only Low-NOx standard measure could include changes in HDV engine manufacturing to include near-zero emission technology to that substantially lowers NOx emission in new HDV models sold starting in 2023. New models that meeting the new standard would be introduced through natural fleet turnover (i.e., replacement of existing models with new models). No new manufacturing facilities would be anticipated to be required.

c) Medium and Heavy-Duty GHG Phase 2

i. Measure Summary

This measure would advance fuel efficiency improvements through the introduction of the next generation of integrated engine, powertrain, vehicle and trailer technologies. This new round of medium and heavy-duty vehicle and engine GHG emission standards, known as Phase 2, will build upon the Phase 1 standards adopted federally in 2011 and in California in 2013. include the next generation of GHG standards for trucks and tractor-trailers and build on the Phase 1 GHG standards, in coordination with pending U.S. EPA approval of federal Phase 2 standards.

U.S. EPA finalized the federal Phase 2 standards for medium- and heavy-duty vehicles in August 2016.[2] The new standards, which push technology improvements beyond what is currently in widespread commercial use, are expected to take effect with model year 2021 for all new class 2b-8 medium- and heavy-duty trucks sold in the nation and in model year 2018 for new trailers, and to be fully phased in by model year 2027. This measure establishes Phase 2 GHG standards for all new class 2b-8 medium- and heavy-duty trucks starting in 2021, and for certain classes of new trailers, starting in 2018. At the federal level, GHG emission reduction requirements would apply to certain box-type trailers for the first time.

~~The federal Phase 2 program is expected to be finalized in spring of 2016 and would encourage the use of technologies such as aerodynamic features on trucks and tractors, waste heat recovery for electricity generation, and engine and transmission improvements. The federal Phase 2 standard is expected to take effect with model year 2021 for all new class 2b-8 medium- and heavy-duty trucks sold in the nation and model year 2018 for new trailers, and would be fully phased in by model year 2027.~~

ARB would consider California's Phase 2 proposal in ~~early~~ 2017. In addition to harmonizing with the federal Phase 2 standards, ARB staff's proposal may include some more stringent, California-only provisions that are necessitated by California's unique air quality challenges (e.g., layering on additional requirements for trailer and vocational vehicle aerodynamics onto the federal Phase 2 program).

ii. Potential Compliance Responses

The actions involved in federal (U.S. EPA) rulemaking activities are beyond ARB's control. It would therefore be speculative for this ~~Draft~~ Final EA to attempt to analyze the impacts of potential compliance responses associated with the federal measure since ARB lacks the authority to implement or design the federal Phase 2 program. Note that if U.S. EPA undertakes these federal rulemaking actions, U.S. EPA would complete the appropriate environmental analysis at the federal level.

Reasonably foreseeable compliance responses under California's proposed Medium- and Heavy-Duty GHG Phase 2 ~~regulations~~ measure would include changes in design and manufacturing of heavy-duty trucks and tractor-trailers to improve engine and vehicle efficiency and aerodynamic performance. This would include improvements in technologies related to exhaust after treatment (e.g., waste heat recovery), engine, and transmission performance. Such changes would be accommodated within the footprint of existing manufacturing facilities and would be implemented through an increased rate of fleet turnover. Turnover may result in recycling or scrapping of old vehicles, or selling vehicles to areas outside of California.

[2] https://www.epa.gov/newsreleases/heavydutyaug162016

d) ~~Advanced~~ Innovative Clean Transit

i. Measures Summary

~~ARB is planning to develop and propose an Advanced Clean Transit (ACT)~~ This measure would support the transition to a suite of cleaner transit options and support the development of a modern, multi-modal, clean transit system, while maintaining access to public transit, which is especially important for people in disadvantaged communities who may have limited mobility choices. This measure would develop and propose a variety of approaches and mechanisms to support the transition to a suite of innovative clean transit options. These approaches may include: 1) securing binding commitments from the state's transit providers for a long-term vision for transitioning to zero-emission buses and other technologies; 2) continuing to support to the maximum extent possible the near-term deployment of zero-emission buses into service where transit agency commitments exist or new actions where the economics become viable and transit service can be maintained, expanded, or enhanced; and 3) working with transit agencies to pilot innovative approaches, including the use of private sector shared vehicle services, to enhance access to existing transit systems with zero-emission first and last-mile solutions.

~~incentive, and/or other control methods that would result in transit fleets purchasing advanced technology buses during normal replacement, and using renewable fuels when contracts are renewed.~~ These approaches ~~measure~~ would ~~consider~~ provide flexibility to ~~allow~~ transit fleets that support timely ~~to~~ implementation of advanced ~~technology~~ technologies in ways that are synergistic with their operations, and ~~potentially~~ recognize factors such as early actions to reduce emissions, utilization of alternative modes of ~~zero~~ zero-emission transportation (e.g., light-rail), and improved efficiencies of the transit system ~~This measure will also be consistent with and complementary to both SB 375 and LCFS~~.

ii. Potential Compliance Responses

Reasonably foreseeable compliance responses under this measure would include an increase in manufacturing and associated facilities to increase the supply of ZEV buses (either Fuel Cell Electric Vehicles [FCEV] or Battery Electric Vehicle [BEVs]), along with construction of new hydrogen fueling stations and electric vehicle charging stations to support ZEV bus operations. Similar to ACC 2, increased demand for lithium batteries could increase production, along with associated increases in lithium mining and exports from source countries or other states. Disposal of any portion of vehicles, including batteries, would be subject to, and be in compliance with existing laws and regulations governing solid waste, such as California's Universal Waste Rule (Cal. Code Regs., tit. 22, Chapter 23). That is, disposal of used batteries into landfills is prohibited; however, they could be refurbished or re-used. To meet an increased demand of refurbishing or reusing batteries, new facilities, or modifications to existing facilities, are

anticipated to accommodate battery recycling activities. Fleet turnover may result in recycling or scrapping of old vehicles, or selling vehicles to areas outside of California.

e) Last Mile Delivery

i. Measure Summary

This measure would reduce emissions and increase the penetration of the first wave of zero-emission heavy-duty technology into applications that are well-suited for its use. Under this measure, ARB would develop and propose a regulation that would ~~require~~ result in the use of low-NOx engines and the ~~purchase~~ deployment of increasing numbers of zero-emission trucks where best suited, primarily for class 3-7 (gross vehicle weight rating above 10,000 pounds) last mile delivery trucks in California. This proposed measure ~~will~~ would ~~require certain fleets that operate last mile delivery trucks to purchase zero-emission trucks starting~~ begin in 2020, with ~~a low fraction~~ small-scale deployment initially, and ramping up to a higher percentage of ~~the fleet gradually at time of normal replacement~~ new vehicles sales. The initial ramp up of ~~zero~~ zero-emission trucks will consider the ability of the new technology to meet the operational needs of the users. ARB staff is evaluating options for purchase requirements.

ii. Potential Compliance Responses

Reasonably foreseeable compliance responses under this measure would include an increase in manufacturing and construction of associated facilities to increase the supply of ZEV last mile delivery trucks (either FCEV or BEVs). Construction of new hydrogen fueling stations and electric vehicle charging stations to support ZEV truck operations would also be required. Increased demand for lithium batteries could increase production, along with associated increases in lithium mining and exports from source countries or other states would be anticipated. Disposal of any portion of vehicles, including batteries, would be subject to, and be in compliance with existing laws and regulations governing solid waste, such as California's Universal Waste Rule (Cal. Code Regs., tit. 22, Chapter 23). That is, disposal of used batteries into landfills is prohibited; however, they could be refurbished or re-used. To meet an increased demand of refurbishing or reusing batteries, new facilities, or modifications to existing facilities, are anticipated to accommodate battery recycling activities. Fleet turnover may result in recycling or scrapping of old vehicles, or selling vehicles to areas outside of California.

f) Innovative Technology Certification Flexibility

i. Measure Summary

This measure would encourage early deployment of the next generation of truck and bus technologies through defined, near-term ARB certification and OBD compliance flexibility for medium- and heavy-duty vehicles. Under this measure, ARB would ~~develop and propose an Innovative Technology Certification Flexibility regulation that~~

~~would~~ provide tiered ARB certification and OBD requirements for an innovative heavy-duty engine or vehicle technology, providing targeted flexibility at market launch and early technology deployment stages, and reverting back to full ARB approval requirements once the technology achieves a market foothold. Proposed hybrid flexibility provisions are structured to preferentially encourage hybrids capable of achieving at least 35 miles of zero-emission range. Initial Innovative Technology Regulation concepts for low-NOx engines are geared towards encouraging manufacturers to accelerate development and market launch of a diversity of alternative-fuel and diesel low-NOx engine families.

ii. Potential Compliance Responses

Reasonably foreseeable compliance responses under this measure would include increased advanced technology research as well as increased development and deployment of lower emitting medium and HDVs and engines. Fleet-turnover rates would not be expected to increase at a rate greater than under the existing conditions. Innovative engine technologies would be expected to be developed within existing facilities and manufactured in existing plants.

g) Zero-Emission Airport Shuttle Buses

i. Measure Summary

This measure would reduce emissions and increase the penetration of the first wave of zero-emission heavy-duty technology into applications that are well-suited for its use. Under this measure, ARB would develop and propose a regulation or other measures to deploy zero-emission airport shuttles in order to further support market development of zero-emission technologies in the heavy-duty sector. Airport passenger shuttles that frequent the airport such as rental car and parking lot shuttles typically operate fixed short routes coupled with stop-and-go operation and low average speeds. As seen in past zero-emission bus demonstrations, vehicles that operate on fixed routes, have stop-and-go operation, and maintain low average speeds are ideal candidates for zero-emission electric technologies.

The current successes of zero-emission transit buses could reasonably be translated to airport shuttle buses due to the similarities between these two vehicle types. A near-term strategy to encourage airports to begin purchasing zero-emission shuttle buses would introduce these buses into the marketplace, which could result in entire zero-emission shuttle bus fleets in the future. Like transit buses, the inclusion of zero-emission airport shuttles would serve as a stepping stone to encourage broader deployment of zero-emission technologies in the on-road sector. Initially, incentive funding could be used to help defer the higher incremental cost of zero-emission airport shuttles as compared to traditionally fueled shuttles. As the capital costs for zero-emission technologies decrease due to higher sales volume, implementation of the near-term strategy could occur either by regulation or a memorandum of understanding (MOU), or a combination thereof. ARB will also consider the feasibility of expanding the

scope of this measure to include emission compliance requirements for other heavy-duty airport vehicles, such as fixed route vehicles entering/exiting the airports and vehicles operating almost exclusively at the airport facility, such as airport owned operational and maintenance vehicles.

ii. Potential Compliance Responses

Reasonably foreseeable compliance responses under this measure would include an increase in manufacturing, production and use of ZEV airport shuttle buses. This could require the construction or modification of associated manufacturing facilities to increase the supply of ZEV airport shuttle buses. Construction of new hydrogen fueling stations and electric vehicle charging stations on existing airport facilities or adjacent areas where airport shuttle buses are based would also be likely. Increased demand for lithium batteries could increase production, along with associated increases in lithium mining and exports from source countries or other states would be anticipated. Disposal of any portion of vehicles, including batteries, would be subject to, and be in compliance with existing laws and regulations governing solid waste, such as California's Universal Waste Rule (Cal. Code Regs., tit. 22, Chapter 23). That is, disposal of used batteries into landfills is prohibited; however, they could be refurbished or re-used. To meet an increased demand of refurbishing or reusing batteries, new facilities, or modifications to existing facilities, are anticipated to accommodate battery recycling activities. Fleet turnover may result in recycling or scrapping of old vehicles, or selling vehicles to areas outside of California.

h) Incentive Funding to Achieve Further Emission Reductions from On-Road Heavy-Duty Vehicles

i. Measure Summary

This measure would provide incentive funding to accelerate the penetration of near-zero and zero-emission engines beyond the rate of natural turnover achieved through implementation of the other proposed measures identified for on-road heavy-duty vehicles. This measure is specifically for the South Coast. This proposed measure would use ~~expand and enhance~~ existing incentive and other innovative funding programs ~~for on-road, HDVs~~ to help increase the penetration of ~~and support for deployment of zero and~~ near-zero and zero-emission ~~equipment~~ heavy-duty trucks. Funding mechanisms would target technologies that meet or exceed an optional low-NOx standard through 2023, when implementation of a new low-NOx standard would begin, and the current round of Carl Moyer program funding ends.

Implementation will require commitment of at least $28 million of the current State and South Coast District incentive funds described above to truck replacement projects in the 2015 to 2020 timeframe. In addition, pending ~~Pending~~ annual appropriation by the Legislature and approval by the Board, ARB's Low Carbon Transportation and Air Quality Improvement Program (AQIP) funds could be apportioned from 2016 through 2020 with approximately $7 million per year allocated for low-NOx trucks using

renewable fuels in the South Coast. These funds could be used to target applications that are well-suited for ZEV applications, such as ZEV drayage. ~~Additionally, up to $28 million per year of SCAQMD funds from Assembly Bill (AB) 923 and Carl Moyer funds could be allocated for cleaner trucks in the 2016-2020 timeframe~~

Funds under the control of the ~~SCAQMD~~ South Coast could also be used for other applications, including off-road vehicles. Identifying the most effective use of funds in order to maximize emission reductions will depend on the incremental cost of technologies, cost effectiveness, and the type of financing mechanism employed. Accordingly, the use of these funds to maximize emission reductions for 2023 may be further refined.

~~The potential for long-term reductions, and the type of financing mechanism employed would factor into decisions regarding how best to use these funds; accordingly, the use of these funds could be further refined for reductions to meet attainment deadlines in 2023.~~

ii. Potential Compliance Responses

Reasonably foreseeable compliance responses under this measure ~~implementation~~ would include an increase in the rate of heavy-duty fleet or vehicle component turnover. Turnover may result in recycling or scrapping of old vehicles. No new manufacturing facilities or major modifications to existing facilities would be expected. Construction of new natural gas fueling stations, hydrogen fueling stations, and electric vehicle charging stations could be required to support near-zero and zero-emission heavy-duty operations. Increased demand for lithium batteries could increase production, along with associated increases in lithium mining and exports from source countries or other states would be anticipated. Disposal of any portion of vehicles, including batteries, would be subject to, and be in compliance with existing laws and regulations governing solid waste, such as California's Universal Waste Rule (Cal. Code Regs., tit. 22, Chapter 23). That is, disposal of used batteries into landfills is prohibited; however, they could be refurbished or re-used. To meet an increased demand of refurbishing or reusing batteries, new facilities, or modifications to existing facilities, are anticipated to accommodate battery recycling activities.

i) Further Deployment of Cleaner Technologies: On-Road Heavy-Duty

i. Measure Summary

This measure is designed to achieve further emission reductions for South Coast ~~Air Basin~~ attainment in 2023 and 2031 through a suite of actions to be undertaken by ARB and SCAQMD to accelerate the penetration of ~~advanced~~ near-zero and zero-emission technologies. Should other Air Districts need to implement this measure to achieve further emission reductions in order to attain the ozone standards, ARB would also work with those Districts to implement this measure. The emission reductions associated with

this proposed measure would be achieved through a combination of actions to be undertaken by both ARB and the South Coast. These actions reflect an initial assessment of a pathway, recognizing that as funding is allocated and advanced technologies further develop, the balance amongst approaches will necessarily adjust.

These actions would include additional incentive funding and developing technologies to accelerate the ~~early~~ penetration of near-zero and ~~near-~~zero-emission technologies, emission benefits beyond the rate of natural turnover achieved through implementation of the other proposed measures identified for on-road heavy-duty vehicles. ~~associated with increased operational efficiency strategies, and the potential for new driver assist and intelligent transportation systems. The emission reductions would be achieved through a combination of actions to be undertaken by both ARB and SCAQMD, including funding programs, regulations, or other mechanisms. These actions reflect an initial assessment of a pathway, recognizing that as advanced technologies further develop and the market develops, funding allocations would change and the balance amongst approaches would necessarily adjust.~~

Under current regulations, nearly all heavy-duty trucks must meet 2010 engine standards by 2023, with the exception of low mileage fleets and public fleets regulated under earlier fleet rule requirements. A key component of the mobile source strategy for HDVs is the adoption of a more stringent engine performance standard reflecting technology that is effectively 90 percent cleaner than today's standards. To achieve the further reductions associated with early penetration of these cleaner heavy-duty technologies, ARB and ~~SCAQMD~~ South Coast staff ~~preliminarily~~ estimate~~s~~ that by 2023, approximately 100,000 to 150,000 trucks would need to have ~~low-NOx~~ engine technologies equivalent to emissions represented by the proposed low-NOx standard, although this vehicle estimate may vary. The following mechanisms would provide a pathway for achieving this scale of technology deployment:

- Identify and develop regulatory mechanisms that incentivize development of near-zero and zero-emission heavy-duty truck deployment. Such actions have been done in the South Coast, including local regulations and the San Pedro Bay Ports Clean Truck Program. These programs have allowed affected fleets to meet requirements through public funding assistance, such as the Port's Clean Truck Program. SCAQMD would include local measures in its Air Quality Management Plan (AQMP) to address HDVs.

- Expand and enhance existing incentive and other innovative funding programs for HDVs to increase the emphasis on and support for purchase of ~~zero and~~ near-zero and zero-emission equipment before 2023. Funding mechanisms would target technologies that meet either lower NOx standards, or are hybrid/zero-emission technologies. Assuming incentive funding is the primary mechanism to achieve the scope of further technology deployment described above, preliminary estimates show that

funding could be required for approximately 15,000 to 20,000 trucks per year over a 7-year period, depending upon the availability of engines certified to ARB's optional low-NOx standards of 0.05 grams per brake horse power hour (g/bhp-hr) and 0.02 g/bhp-hr. The incentive funding required for this effort would go beyond the amount currently authorized for existing programs through 2023. Continued incentive funding post-2023 to further accelerate the deployment of trucks meeting a 0.02 g/bhp-hr standard would provide additional reductions for 2031.

Additional mechanisms for achieving the needed emission reductions reflect ~~continued~~ actions by ARB and others to continue increasing the penetration of zero-emission technologies, as well as reductions achieved through operational efficiencies. While these approaches would have the greatest potential to provide further reductions post-2023, early advances in these areas could offset some of the reductions required through incentive funding. These additional pathway mechanisms include:

- Deploying ZEVs in heavier applications that are currently well-suited for broad market development, such as transit buses, airport shuttles, and last mile delivery. Depending upon the success of these applications, and ongoing technology assessments, regulatory mechanisms to require ZEVs in additional applications may be feasible. The greatest opportunities exist for fleets that are captive to the South Coast, and drive shorter distances. ~~To further support deployment of ZEV technologies in heavier applications, a solicitation for a $25 million demonstration project for zero-emission drayage trucks~~ This technology assessment is already underway.

ii. Potential Compliance Responses

Reasonably foreseeable compliance responses under this measure include increased use of optionally certified low-NOx engines, ZEVs, and associated technology in the on-road HDV class, changes in manufacturing requirements and facilities, increased infrastructure for hydrogen refueling and charging. Increased demand for lithium batteries could increase production, along with associated increases in lithium mining and exports from source countries or other states would be anticipated. Disposal of any portion of vehicles, including batteries, would be subject to, and be in compliance with existing laws and regulations governing solid waste, such as California's Universal Waste Rule (Cal. Code Regs., tit. 22, Chapter 23). That is, disposal of used batteries into landfills is prohibited; however, they could be refurbished or re-used. To meet an increased demand of refurbishing or reusing batteries, new facilities, or modifications to existing facilities, are anticipated to accommodate battery recycling activities. Fleet turnover may result in recycling or scrapping of old vehicles, or selling vehicles to areas outside of California, in addition to associated changes in manufacturing requirements and facilities, increased infrastructure for natural gas fueling stations, hydrogen refueling and charging, increased demand for lithium batteries and associated increases in

lithium mining and exports, and increased recycling or refurbishment of lithium batteries and construction or modification of associated facilities.

3. Off-Road Federal and International Sources

The off-road federal and international sources category includes emissions associated with ships, locomotives, and aircraft. These sources are primarily regulated by the federal government and international organizations.

a) More Stringent National Locomotive Emission Standards

i. Measure Summary

This measure would reduce emissions from locomotives. ARB would petition U.S. EPA ~~to promulgate, by 2020, both Tier 5 national emission standards~~ for new~~ly~~ national ~~manufactured~~ locomotive emission standards ~~and more stringent national requirements~~ for ~~remanufactured locomotives. These standards would be designed to achieve~~ significant additional reductions in criteria and toxic pollutants and GHG emissions. ARB staff estimates that U.S. EPA could require manufacturers to implement the new locomotive emission regulations by as early as 2023 for remanufactures and 2025 for newly manufactured locomotives.

This measure describes the emissions levels that ARB staff believes would be achievable with a new generation of national emissions standards for locomotives, including both newly manufactured and remanufactured units. The description focuses on technology that could be employed to reach the lower emission levels to address local, regional, and global air pollution concerns in California, and in other states with high levels of railyard activity or rail traffic.

~~The proposed U.S. EPA locomotive emission regulations could further reduce emissions from the existing Tier 4 locomotive baseline by over 75 percent with the use of proven locomotive after-treatment systems (e.g., exhaust system upgrades), renewable natural gas, hydrogen, or electricity.~~ U.S. EPA could also facilitate development and deployment of ~~include provisions with incentives for locomotive manufacturers and railroads to develop and operate locomotives with~~ zero-emission track miles for ~~specific nonattainment areas in the country (e.g., South Coast air basin) that could provide additional CAP, TAC, and GHG reductions.~~ locomotives and zero-emission locomotives by building incentives for those technologies into the regulatory structure.

ii. Potential Compliance Responses

If U.S. EPA decides to undertake a rulemaking in response to ARB's petition, such a rulemaking could require production facilities, transportation and storage of renewable natural gas (e.g., from dairies) and hydrogen, increased demand for lithium batteries and associated increased in lithium mining and exports, and increased recycling or

refurbishment of lithium batteries and construction or modification of associated facilities. After-treatment systems could be produced in existing manufacturing facilities and would be installed in existing locomotives. The U.S. EPA rulemaking could also increase the turnover rate of in-use interstate, regional and switch locomotives through the use of after-treatment and zero-emission technology. It is expected that this would be accommodated through existing facilities.

These actions involve federal (i.e. U.S. EPA) rulemaking activities that are beyond ARB's control. It would therefore be speculative for this ~~Draft~~ Final EA to attempt to analyze the impacts of potential compliance responses associated with this measure, since ARB lacks authority to implement or design the federal measure. Note that if U.S. EPA undertakes these federal rulemaking actions, U.S. EPA would complete the appropriate environmental analysis at the federal level.

b) Tier 4 Vessel Standards

i. Measure Summary

This measure would reduce emissions from ocean-going vessels (OGVs). Under this ~~action~~ measure, ARB would advocate with ~~U.S. EPA, the U.S. Coast Guard, and~~ international partners for the International Maritime Organization (IMO) to establish new Tier 4 NOx and PM standards, plus efficiency targets for existing vessels, and new vessel categories not covered by IMO efficiency standards. Specifically, ARB would advocate for a Tier 4 NOx standard for new marine engines on ocean-going vessels and vessel efficiency requirements for the existing in-use fleet.

Additional regulations are necessary because the existing IMO marine engine regulations do not include a PM standard, and the Tier 3 2016 NOx standard is higher than the NOx standards for other diesel equipment categories. In addition, the IMO efficiency standards for existing vessels only require that vessels have a "Ship Energy Efficiency Management Plan." These regulations do not require approval of the plan, tracking of the vessel's progress, or actual improvement in energy efficiency.

ii. Potential Compliance Responses

Reasonably foreseeable compliance responses under this measure would include ARB staff working with federal and international agencies to adopt more stringent emissions standards for new ocean-going vessels. Adoption and implementation of Tier 4 standards in ocean-going vessels are under the regulatory authority of IMO and others. However, such changes could result in vessel efficiency upgrades for the existing in-use fleet. These actions involve federal (IMO) rulemaking activities that are not subject to ARB consideration. It would therefore be speculative for this ~~Draft~~ Final EA to attempt to analyze the impacts of potential compliance responses associated with this measure. Note that if U.S. EPA undertakes these federal rulemaking actions, it would complete the appropriate environmental analysis at the federal level.

d) Incentivize Low-Emission Efficient Ship Visits

i. Measure Summary

This measure would achieve early implementation of clean vessel technologies such as liquefied natural gas, Tier 3 standards or better, and incentivize California service for vessels with those technologies. Under this measure, ARB staff would work with California seaports, ocean carriers, and other stakeholders to develop criteria and identify the best way to incentivize introduction of ~~Super-Efficient~~ Low Emission Efficient Ships into the existing fleet of vessels that visit California seaports.

~~The goal of this measure is to achieve early implementation of clean vessel technologies (e.g., liquefied natural gas, Tier 3 standards or better) and incentivize vessels with those technologies in California service. Incentive programs can be leveraged to encourage vessel owners and operators to implement technologies that exceed current regulatory requirements.~~ Under this proposed measure, ARB staff would work with California seaports and other stakeholders to develop criteria for a Super-Low Emission Efficient Ship, targeting NOx, diesel PM, GHG, and sulfur oxide emissions. Incentive programs can be leveraged to encourage vessel owners and operators to implement technologies that exceed current regulatory requirements. ~~Incentives to encourage visits from ships meeting the criteria~~ This would involve identification of funding sources and implementation mechanisms such as development of new programs, enhancement of existing programs such as the Port of Long Beach Green Flag program and the Port of Los Angeles Environmental Ship Index Incentive Program, or incorporation into existing ~~statewide~~ Statewide incentive programs.

ii. Potential Compliance Responses

Reasonably foreseeable compliance responses under this measure would include encouraging the docking of cleaner, more efficient large ships in California's ports (capacity greater than 14,000 TEU [20-foot equivalent units]).

e) At-Berth Regulation Amendments

i. Measure Summary

This measure would further reduce emissions from ships that visit California ports. ~~In December 2007, ARB approved the Airborne Toxic Control Measure for Auxiliary Diesel Engines Operated on Ocean-Going Vessels At-Berth in a California Port Regulation (i.e., the At-Berth Regulation). The At-Berth Regulation was designed to reduce emissions from diesel auxiliary engines on container ships, passenger ships, and refrigerated cargo ships while at berth at California's major seaports. The Regulation is limited to fleets of 25 or more vessels (five or more for passenger ships).~~ Under this measure, ARB would investigate potential amendments to the At-Berth Regulation, including whether the At-Berth Regulation could be amended to include smaller fleets,

and/or additional vessel types (including roll-on/roll-off vehicle carriers, bulk cargo carriers, and tankers), and additional operations.

ii. Potential Compliance Responses

Reasonably foreseeable compliance responses under this measure could include the use of bonnet capture devices to be used at ports. These systems could be made available on barges that would remain within the port and attach to ocean-going vessels while their auxiliary engines are operating. Additional ships and terminals may implement electric system upgrades in response to this measure. It is assumed that manufacturing capacity is available to meet upgrade demands. It is also anticipated that any shore-side construction that may occur would take place on areas that are previously disturbed.

f) Further Deployment of Cleaner Technologies: Off-Road Federal and International Sources

i. Measure Summary

This measure is designed to achieve further emission reductions for South Coast Air Basin attainment in 2023 and 2031 through a suite of actions to be undertaken by ARB and SCAQMD to accelerate the penetration of advanced near-zero and zero-emission technologies. Should other Air Districts need to implement this measure to achieve further emission reductions in order to attain the ozone standards, ARB would also work with those Districts to implement this measure. The emission reductions associated with this proposed measure would be achieved through a combination of actions to be undertaken by both ARB and the South Coast. These actions reflect an initial assessment of a pathway, recognizing that as funding is allocated and advanced technologies further develop, the balance amongst approaches will necessarily adjust.

This measure is intended to achieve early penetration of cleaner technologies and emission benefits associated with increased efficiencies for ocean-going vessel, locomotives, and aircraft technologies, and to promote efficiency improvements at the equipment, sector, and systems level.

While more stringent engine standards have been established for new equipment, existing equipment tends to remain in operation for a long period of time. In addition, these sources are primarily regulated by the federal government and international organizations. As a result, emissions from these categories have not decreased at the same pace as those for other mobile sources. Achieving the magnitude of emission reductions necessary from this category is therefore more difficult, and will require strong action at the federal and international level, coupled with State and local advocacy and action to facilitate these efforts.

ARB and South Coast staff have estimated the scope of technology development and penetration necessary to achieve equal share reductions goals for this sector as one

example pathway of what would be necessary by 2023 and 2031 to ~~chieving~~ achieve equal share reductions ~~would represent a significant expansion of cleaner technology deployment~~ from this sector. The time frame to accomplish this is short, the development of cleaner technologies lags behind those for other sectors, and the scope of State and local authority is limited. These issues will need to be considered as the proposed measures are further developed for this SIP. For 2023, this would require: 1) all locomotives operating in the South Coast meeting the Tier 4 standard; 2) all aircraft meeting today's Tier 8 emission levels; and 3) ocean going vessels achieving emission levels significantly cleaner than today's requirements. An equal share pathway for this sector post-2023 would require deployment of locomotives meeting a more stringent Tier 4+ standard. More stringent Tier 4 ocean-going vessel standards would also be necessary. Finally, operational efficiency strategies would be needed to provide an additional mechanism for further reductions as a complement to deployment of cleaner technologies.

A series of actions that would be taken at the State and local level to achieve further reductions are outlined below:

- Expand and enhance existing incentive and innovative funding programs to increase the emphasis on and support for deployment of cleaner technologies in these sectors. Air quality incentives and transit funding programs, for example, will be effective in transforming the passenger rail system in the South Coast, with nearly all Metrolink trains expected to reach a Tier 4 level by 2023.

  The incentive funding required will go well beyond the amount currently authorized under existing programs through 2023. Funding needs and mechanisms will be identified working in collaboration with the South Coast over the next several months.

- Partner with airports to incentivize cleaner aircraft to come to California airports, along with partnerships with international engine manufacturers to encourage production of cleaner, more efficient engines.
- Seek continued funding for and partnerships with federal agencies such as the U.S. Department of Energy, U.S. EPA, Federal Aviation Administration (FAA), U.S. Maritime Administration, and Federal Railroad Administration for new technology and fuel demonstration projects. This would include efforts on development of hybrid, battery and fuel cell technologies for locomotives, the FAA's CLEEN program, and retrofit technologies for in-use vessels and boilers.
- Encourage efficiency improvements, including industry based initiatives (like the San Pedro Bay Ports' Supply Chain Optimization effort to increase port competitiveness), as well as concepts being developed as part of the California Sustainable Freight Action Plan. These improvements may include approaches such as reducing unproductive

moves, use of marine vessel sharing agreements that result in maximum use of cargo space, and increased reliance on logistics planning and operations software.

ii. Potential Compliance Responses

Reasonably foreseeable compliance responses under this measure would be similar to other compliance responses already described for off-road federal and international sources in terms of strengthening emissions standards or development of zero-emission technology, with the key difference being early implementation and deployment. Efficiency improvements would require no new facilities and would involve maximizing the efficiency of existing systems or optimizing operations at existing facilities.

4. Off-Road Equipment

The off-road equipment category encompasses lawn and garden equipment, transport refrigeration units, vehicles and equipment used in construction and mining, forklifts, cargo handling equipment, commercial harbor craft, and other industrial equipment.

a) Zero-Emission Off-Road Forklift Regulation Phase 1

i. Measure Summary

This measure would accelerate the deployment of zero-emission technologies in off-road equipment types that are already primed for the technologies that exit today, and to facilitate further technology development and infrastructure expansion by demonstrating its viability. ARB would develop and propose a regulation to increase penetration of ZEVs in off-road applications, with specific focus on forklifts with lift capacities equal to or less than 8,000 pounds, for which zero-emission technologies have already gained appreciable customer acceptance and market penetration. The regulation could also include requirements that result in the deployment of zero-emission technologies in heavier equipment that remains at a particular location for extended periods of time or other similar provisions that would spur further technology innovation.

ii. Potential Compliance Responses

Reasonably foreseeable compliance responses under this measure would include an increase in manufacturing, production and use of zero-emission technology in forklifts meeting criteria defined in the regulation. This could require the construction or modification of associated manufacturing facilities to increase the supply of zero-emission technology in forklifts, including BEVs, but also potentially FCEV. Construction of new hydrogen fueling stations and electric vehicle and equipment charging stations at locations where forklifts operate such as airport facilities, warehouses, and distribution centers would also be anticipated. Increased demand for lithium batteries could increase production, along with associated increases in lithium mining and exports from

source countries or other states would be anticipated. Disposal of any portion of vehicles, including batteries, would be subject to, and be in compliance with existing laws and regulations governing solid waste, such as California's Universal Waste Rule (Cal. Code Regs., tit. 22, Chapter 23). That is, disposal of used batteries into landfills is prohibited; however, they could be refurbished or re-used. To meet an increased demand of refurbishing or reusing batteries, new facilities, or modifications to existing facilities, are anticipated to accommodate battery recycling activities.

b) Zero-Emission Off-Road Emission Reduction Assessment

i. Measure Summary

This measure would expand the use of zero-emission technology in non-freight, off-road applications. This proposed further-study measure would be a follow-up to off-road measures implemented in the 2023+ timeframe, such as the Zero-Emission Off-Road Forklift Regulation Phase 1, and through it ARB would identify opportunities to further expand the use of near-zero and zero emission technologies in off-road applications. ARB staff would conduct an assessment and provide the Board with an informational update regarding the status of ZEVs in off-road applications, once the Phase I Forklift Regulation is in place. This update ~~which~~ would identify opportunities to further expand their use. The focus would be on transferring near-zero and ~~zero~~ zero-emission technologies ~~high lift-capacity forklifts or other pieces of~~ to heavier pieces of off-road equipment, such as high lift-capacity forklifts or other equipment in the construction, industrial, and mining sectors, with the intent of expanding their application as technology matures and infrastructure grows. This evaluation would focus primarily on the scalability and transferability of zero-emission technologies to larger, higher power-demand equipment types and would be used to inform the development of the Phase 2 regulation.

The information obtained from this technology review would be used to inform the development of Phase 2 of the Zero-Emission Off-Road Regulation. The Zero-Emission Off-road Phase 2 Regulation would build upon the Phase 1 regulation and focus primarily on larger, higher power-demand equipment types (e.g., large forklifts, construction equipment). The scope and timeframe of the regulation would depend upon advancements in technology and information obtained through the Advanced Off-Road Emission Reduction Assessment.

ii. Potential Compliance Responses

No reasonably foreseeable compliance responses are expected ~~from~~ under this measure, as it would only involve ARB staff providing an information update to the Board.

c) Zero-Emission Off-Road Worksite Emission Reduction Assessment

i. Measure Summary

This measure would advance ZEV commercialization by increasing the penetration of zero-emission technologies. ARB staff would conduct an assessment of ~~provide the Board with an informational update regarding an analysis of~~ the technologies or strategies that increase worksite efficiency, such as connected vehicles, automation, and fleet management technologies, and provide the Board with an informational update ~~in off-road sectors~~. Advanced machine control and worksite integration technologies that are commercially available today reportedly hold the potential for fuel savings of up to ~~more than~~ 30 percent or more, depending on worksite conditions. Some of these products are already available today from new equipment manufacturers, as well as aftermarket suppliers, and ~~could~~ can be adapted or retrofitted to much of the existing legacy fleet. The scalability of these systems is wide-ranging, and such systems could be applied to a single piece of off-road equipment on a small project or on many vehicles at the largest, most complex worksites. While there is significant promise in these types of technologies, more work has to be done to ensure the development of a robust worksite efficiency program that is cost-effective and achieves emission reductions that are real and quantifiable. This measure concept would evaluate business return on investment, sustainability of the system, and ancillary benefits such as improved safety and work consistency. There would also be potential testing to compare fuel efficiency, work productivity, and emission reductions via portable emission measurement system (PEMS).

ii. Potential Compliance Responses

No reasonably foreseeable compliance responses are expected ~~from~~ under this measure, as it would only involve ARB staff providing an information update to the Board.

d) Zero-Emission Airport Ground Support Equipment

i. Measure Summary

This measure would increase the penetration of the first wave of zero-emission heavy-duty technology in applications that are well suited to its use, and facilitate further technology development and infrastructure expansion. ARB staff would develop and propose a regulation to accelerate the transition of diesel and large spark ignition (LSI) airport ground support equipment (GSE) to zero-emission technology.

The current commercial availability of several GSE equipment types indicates the feasibility of this transition. Battery-electric GSE are the most common type of zero-emission GSE, and are available for several high-population equipment types. Many large air carriers which operate diesel GSE have already begun using electric

equipment. The added introduction of zero-emission GSE would act as a catalyst to further zero-emission equipment penetration in the off-road equipment sector and other heavier duty-cycle and longer-range applications.

A conservative strategy would rely on incentives and natural turnover, along with current in-use requirements, to replace equipment in which electric options are readily available, such as belt loaders, baggage tractors and cargo tractors. A more aggressive turnover and implementation strategy could use an MOU, a regulation, or a combination thereof, along with incentives for demonstration, to ensure 60 percent of existing diesel equipment in these categories, along with 50 percent of narrow body aircraft tugs and 30 percent existing wide-body aircraft tugs, would be replaced with zero-emission equipment by 2032. Incentive funds would be targeted to demonstrating the feasibility of zero-emission technologies in the high-power equipment applications (e.g., wide-body aircraft tugs).

ii. Potential Compliance Responses

Reasonably foreseeable compliance responses under this measure would include an increase in manufacturing, production and use of zero-emission technology in airport GSE. This could require the construction or modification of associated manufacturing facilities to increase the supply of zero-emission technology for GSE, including BEVs or battery-powered equipment, but also potentially FCEVs. Construction of new hydrogen fueling stations and electric vehicle and equipment charging stations on existing airport facilities where GSE are based would also be likely. Increased demand for lithium batteries could increase production, along with associated increases in lithium mining and exports from source countries or other states would be anticipated. Disposal of any portion of vehicles, including batteries, would be subject to, and be in compliance with existing laws and regulations governing solid waste, such as California's Universal Waste Rule (Cal. Code Regs., tit. 22, Chapter 23). That is, disposal of used batteries into landfills is prohibited; however, they could be refurbished or re-used. To meet an increased demand of refurbishing or reusing batteries, new facilities, or modifications to existing facilities, are anticipated to accommodate battery recycling activities. Turnover may result in recycling or scrapping of old vehicles, or selling vehicles to areas outside of California.

e) Small Off-Road Engines

i. Measure Summary

This measure would reduce emissions from Small Off-Road Engines (SORE) and increase the penetration of zero-emission technology. Small off-road engines that are subject to ARB regulations are used in residential and commercial lawn and garden equipment, and other utility applications. ARB staff would promote increased use of zero-emission equipment, propose tighter exhaust and evaporative emission standards, and enhance enforcement of current emissions standards for SORE.

High failure rates have been observed in evaporative emissions testing of small off-road engines, preventing previously-claimed emission reductions from being realized. Exhaust and evaporative emissions from ~~small off-road engines~~ SORE would be reduced through enhanced enforcement of the current emission standards, development of tighter emission standards, and increased use of zero-emission equipment. Strategies would be developed for transitioning to zero-emission technologies ~~from small off-road equipment~~, including ~~phased emission standards and~~ an initial focus on incentives for use of zero-emission equipment. ~~A conservative strategy would use incentives and natural turnover to replace 25 percent of all spark-ignited small off-road engines and equipment with zero-emission equipment by 2030. The greatest emission reductions from incentives would be realized by the early turnover of commercial lawn and garden equipment to zero-emission equipment, which accounts for a disproportionate amount of small off-road engine emissions.~~ , coupled with increasingly stringent emission standards for criteria pollutants and GHGs.

ii. Potential Compliance Responses

Reasonably foreseeable compliance responses under this measure would include an increase in manufacturing, production and use of zero-emission technology in small off-road engines. This could require the construction or modification of associated manufacturing facilities to increase the supply of zero-emission technology for small off-road engines, including battery electric-powered equipment. Increased demand for lithium batteries could increase production, along with associated increases in lithium mining and exports from source countries or other states would be anticipated. Disposal of any portion of vehicles, including batteries, would be subject to, and be in compliance with existing laws and regulations governing solid waste, such as California's Universal Waste Rule (Cal. Code Regs., tit. 22, Chapter 23). That is, disposal of used batteries into landfills is prohibited; however, they could be refurbished or re-used. To meet an increased demand of refurbishing or reusing batteries, new facilities, or modifications to existing facilities, are anticipated to accommodate battery recycling activities. Turnover may result in recycling or selling old equipment.

f) Transport Refrigeration Units Used for Cold Storage

i. Measure Summary

This measure would advance near-zero and zero emission technology commercialization by increasing the early penetration of hybrid electric and electric standby-equipped Transport Refrigeration Units (TRU) used for cold storage, and supporting the needed infrastructure developments. ARB staff would develop ~~and propose~~ a regulation to reduce NOx, PM, and GHG emissions by ~~prohibiting the use of~~ reducing the amount of time that TRUs operating on internal combustion engines while refrigerated trucks, trailers, and shipping containers are parked (i.e. stationary) at certain California facilities. ~~powered transport refrigeration units (TRUs) for cold storage in phases, with potential incentive support for infrastructure.~~ The initial concepts of the

proposed regulation would limit the amount of stationary operating time that a transport refrigeration system powered by an internal combustion engine could operate at certain facilities. The time limit would decrease on a phased compliance schedule. Compliance options include the use of commercially available hybrid electric standby motors, and cryogenic TRUs~~, TRUs equipped with electric standby motors, and cryogenic transport refrigeration systems~~. Hybrid electric and electric standby-equipped TRUs would plug into electric power plugs while stationary, and use diesel engine power while on the road. Facilities may be required to provide the necessary electric infrastructure to support this action. ARB is currently offering funding through the Proposition 1B Goods Movement Emission Reduction Program to support both purchase of TRUs that can plug in and the stationary electric infrastructure. Cryogenic transport refrigerators use liquid nitrogen and liquid carbon dioxide to provide cooling. Development and use of zero-emission technologies, such as all-electric plug-in / advanced battery transport refrigeration systems would be encouraged, as well as adequately-sized cold storage facilities, and more efficient inbound delivery appointment and outbound dispatch scheduling.

ii. Potential Compliance Responses

Reasonably foreseeable compliance responses under this measure would include an increase in manufacturing, production and use of zero-emission technology in TRUs. This could require the construction or modification of associated manufacturing facilities to increase the supply of zero-emission technology for TRUs, including electric hybrid or full battery electric-powered equipment. Increased demand for lithium batteries could increase production, along with associated increases in lithium mining and exports from source countries or other states would be anticipated. Disposal of any portion of vehicles, including batteries, would be subject to, and be in compliance with existing laws and regulations governing solid waste, such as California's Universal Waste Rule (Cal. Code Regs., tit. 22, Chapter 23). That is, disposal of used batteries into landfills is prohibited; however, they could be refurbished or re-used. To meet an increased demand of refurbishing or reusing batteries, new facilities, or modifications to existing facilities, are anticipated to accommodate battery recycling activities. Compliance responses under this measure could also include construction of new cold storage facilities or expansion or modification of existing cold storage facilities.

g) Further Deployment of Cleaner Technologies: Off-Road Equipment

i. Measure Summary

This measure is designed to achieve further emission reductions for South Coast ~~Air Basin~~ attainment in 2023 and 2031 through a suite of actions to be undertaken by ARB and the ~~SCAQMD~~ South Coast to accelerate the penetration of ~~advanced~~ near-zero and zero-emission technologies. Should other Air Districts need to implement this measure to achieve further emission reductions in order to attain the ozone standards, ARB

would also work with those Districts to implement this measure. ~~This measure is designed to achieve early penetration of zero and near-zero technologies, and emission benefits associated with the potential for worksite integration and efficiency.~~ The~~se~~ emission reductions associated with this proposed measure would be achieved through a combination of actions to be undertaken by both ARB and SCAQMD. These actions reflect an initial assessment of a pathway, recognizing that as funding is allocated and advanced technologies further develop, the balance amongst approaches will necessarily adjust.

Under current requirements, most new equipment is required to meet Tier 4 emission standards, and many smaller engines are converting to use of zero-emission technologies. To achieve the further reductions associated with early penetration of the cleanest technologies across each sector, ARB and South Coast staff estimated the scope of penetration that would be required by 2023. This would include:

1. electrification of small engine forklifts with less than 8,000 pound lift capacity;

2. cleaner near-zero and ~~near~~-zero-emission technologies for TRUs;

3. electrification of GSE such as baggage tugs, belt loaders, cargo tractors, and aircraft tugs;

4. electrification of certain types of lawn and garden equipment such as mowers, leaf blowers, and edgers; and

5. replacement of construction, mining, and industrial equipment with engines that are below Tier 4 with Tier 4 final equipment.

The following mechanisms provide a pathway for achieving this scale of technology deployment:

- Identify and develop mechanisms to incentivize deployment of construction and mining equipment meeting Tier 4 final standards such as the South Coast's SOON program for the clean-up of off-road diesel equipment. Such programs have allowed affected fleets to meet requirements through public funding assistance. This could achieve further reductions from the approximately 7,000 pieces of equipment that would still have engines that are Tier 2 and below in 2023 without funding assistance. SCAQMD would include local measures to address certain types of heavy-duty equipment in their AQMP.

- Develop requirements for cleaner near-zero and ~~near~~-zero-emission technologies for TRUs. Emission reductions associated with Transport Refrigeration Units Used for Cold Storage measure have not yet been quantified. This proposed measure reflects concepts to limit the amount of stationary operating time that a TRU powered by an internal combustion

engine could operate at certain facilities. Development and use of near-zero and zero-emission technologies would be encouraged. This proposed measure will need to motivate distribution and other facilities to install the infrastructure needed to support near-zero and ~~near-~~zero-emissions technologies, encourage the development and demonstration of near-zero and ~~near-~~zero-emission technologies, and cause refrigerated fleets to evaluate and invest in near-zero and ~~near-~~zero-emission technologies.

- Expand and enhance existing incentive and other innovative funding programs for off-road equipment to increase the emphasis on and support for zero-emission equipment. Assuming incentive funding is the primary mechanism to achieve early deployment of zero-emission technologies for forklifts, airport GSE, and TRUs by 2023, preliminary estimates show that funding could be required for at least 4,000 pieces of equipment per year over a 7 year period, though these numbers are subject to change. This early deployment through enhanced incentive funding would provide a down payment towards meeting requirements that would be established through the subsequent regulatory mechanisms identified for these categories. The population of lawn and garden equipment in the South Coast is very large, thus funding programs would target the types of equipment with the greatest emissions, such as mowers, leaf blowers, and edgers. Use of zero-emission technologies would also provide near-source risk reduction for operators of the equipment. The incentive funding required for these efforts would go beyond the amount currently authorized through 2023.

Additional mechanisms reflect continued penetration of zero-emission technologies, as well as reductions achieved through worksite efficiencies. While these approaches have the greatest potential to provide further reductions post 2023, early advances in these areas could offset some of the reductions required through incentive funding. These additional pathway mechanisms include:

- Further advanced technology deployment. Based on on-going technology assessments, regulatory mechanisms to expand zero-emission technologies into heavier pieces of off-road equipment such as high lift-capacity forklifts and other equipment in the construction, mining, and industrial sectors may be feasible. The greatest opportunities exist for equipment that operates with a duty cycle that can accommodate battery electric or fuel cell electric technologies.

- Advances in the development of worksite efficiencies, particularly if based on zero-emission technologies, as well as greater worksite integration, efficiency and fleet management technologies. These changes in how the off-road equipment sector would operate offer the potential to achieve

criteria, toxic, and GHG emission reductions as well as reduce petroleum usage. These concepts are based on emerging technologies, and would require exploration and demonstration prior to quantifying emission reductions.

ii. Potential Compliance Responses

Reasonably foreseeable compliance responses under this measure may increase the turnover rate of engines and/or components for off-road equipment. Turnover may result in recycling or scrapping of old engines or components. Other reasonably foreseeable compliance responses under this measure are similar to those previously described for other measures in the Off-Road Equipment sector.

5. Fuels

a) Low-Emissions Diesel Requirement

i. Measure Summary

This measure would reduce emissions from the portion of the heavy-duty fleet that will continue to operate on internal combustion engines, in order to reduce emissions as quickly as possible. ARB staff would ~~would develop and propose~~ establish performance requirements for Low-Emission Diesel, and require that diesel fuel providers decrease criteria pollutant emissions from their diesel products until 2031. ~~a regulation that would require Low-Emission Diesel to comprise a steadily increasing percent of the CARB diesel pool.~~ Due to the magnitude of needed NOx reductions in the South Coast and the large volumes of Low-Emission Diesel needed for full Statewide implementation, the measure ~~concept~~ could be phased-in with ~~an~~ a gradual implementation strategy that starts in the South Coast air basin, and subsequently expands Statewide.

The standard would be flexible and enable multiple fuel types to meet the standard. The Low-Emission Diesel ~~fuels~~ standard would achieve a reduction in NOx and PM emissions relative to current conventional diesel. ~~would be subject to the Low Carbon Fuel Standard (LCFS), which requires life cycle analysis, as well as less than one percent aromatics, virtually no sulfur, and a blendstock carbon intensity (CI) maximum of 30-60 grams of carbon dioxide equivalent per megajoule (gCO_2e/MJ).~~ This standard is anticipated to increase consumption of Low-Emission Diesel fuels, ~~including renewable hydrocarbon diesel (more commonly known as renewable diesel)~~ and to reduce emissions from ~~such feedstocks as oil seeds and tallow; and/or compressed or liquefied renewable Low-Emission Diesel fuels from gas to liquid processing of biomethane or forest residues. Renewable hydrocarbon diesel is currently anticipated to be the most likely fuel to meet the Low-Emission Diesel requirements~~ conventional fuels.

The proposed measure ~~concept~~ would provide NOx benefits predominately from legacy (pre-2010) on-road HDVs, off-road engines, stationary engines, portable engines,

marine vessels and locomotives, as well as diesel PM benefits in potentially all model year on-road engines, off-road engines, stationary engines, portable engines, marine vessels and locomotives. Interstate vehicles, even those registered out-of-state but operating on Low-Emission Diesel fuel would also be anticipated to provide emission reduction benefits.

ii. Potential Compliance Responses

Reasonably-foreseeable compliance responses under this measure would relate to a requirement of increasing amounts of Low-Emission Diesel fuels ~~comprising 50 percent of the diesel~~ consumed in the State. This may result in increased demand for renewable diesel, biodiesel, or other Low-Emission Diesel fuel feedstocks, such as oil seeds or forest residues, and/or increased imports of tallow and used cooking oil into California for processing. Additional infrastructure to support the collection, processing, and distribution of biomethane may be required. Implementation of this measure could require changes to fuel processing and transport. As the Low-Emission Diesel requirement would most likely be fulfilled using renewable diesel, as well as other fuels that are all generally compatible with current infrastructure ~~,and because renewable diesel and conventional CARB diesel are chemically indistinguishable~~, a substantial amount of new storage facilities are not anticipated. To meet increased Low-Emission Diesel demand, fuel processing, feedstock or finished fuel production and/or imports, and transportation of Low-Emission Diesel feedstocks or finished fuels may increase. In addition, if gas to liquid diesel from biomethane or forest residues were to be utilized for compliance with this measure, infrastructure to support collection, processing, and distribution of biomethane or forest residues would be required.

6. Consumer Products

Chemically formulated consumer products such as automotive care products, household care products, and personal care products have been regulated as a source of ROG emissions in numerous rulemakings since 1989. Consumer products are the largest source category of ROG emissions in the South Coast, and the fourth largest category Statewide**.** The magnitude of emissions from this sector indicates that additional approaches to reduce emissions from this sector remain important, even though the average photochemical reactivity of ROG emissions from the consumer product sector has decreased. ~~As a result of these measures, statewide emissions from consumer products in 2012 have been reduced 50 percent from uncontrolled levels. Despite this progress, population growth in the years ahead is expected to increase emissions from consumer products even as new and revised limits become effective in 2017.~~

a) Consumer Products Program

i. Measures Summary

Current regulations have been effective in substantially reducing emissions of ROG from consumer products. The goal of this proposed measure would be to maintain this success in light of population growth. Staff would evaluate the 2013-2015 data reported to the Consumer Products Program to identify strategies to maintain emission reductions from consumer products. The proposed measure may involve establishing new ROG limits for categories currently unregulated and/or lowering ROG limits for categories already regulated. To identify categories of consumer products for rulemaking, staff may consider both mass and reactivity of category emissions. Approaches being considered include evaluating categories with higher mass and reactivity, investigating concepts for expanding manufacturer compliance options, and reviewing existing exemptions. Staff will work with stakeholders to explore mechanisms that would encourage the development, distribution, and sale of cleaner, very low, or zero-emitting products. In undertaking these efforts staff will ensure that no negative impacts occur either through the use of TACs or other chemicals that may have other negative environmental impacts. ~~The proposed measure may involve establishing new ROG limits for categories currently unregulated and/or lowering ROG limits for categories already regulated. To identify categories of consumer products for rulemaking, staff may consider both mass and reactivity of category emissions. To further reduce ROG emissions from consumer products while providing industry with additional flexibility, staff may investigate opportunities to establish alternative compliance options to provide flexibility to industry to comply with regulations, such as an emission "bubble" or cap to reduce ROG emissions from consumer products. Other approaches, including a multi-media labeling program or other incentive programs, would also be evaluated.~~

ii. Potential Compliance Responses

~~Compliance~~ Reasonably foreseeable compliance responses under this measure would ~~with consumer products would~~ include ~~continue~~ continuing ARB's commitment to reduce ROG emissions from consumer products. Staff and industry are undertaking a comprehensive data reporting effort to gather information about sales trends and product formulations. Staff uses this data along with trade journals, patents, and other technical information to propose mass-based ROG limits. Staff would continue to investigate any and all opportunities for emission reductions by taking advantage of emerging low-emitting technologies.

D. Summary of Compliance Responses

Reasonably foreseeable compliance responses associated with the State SIP Strategy include: increased infrastructure for natural gas and hydrogen refueling stations; increased demand for lithium battery manufacturing and associated increases in lithium mining and exports; increased recycling or refurbishment of lithium batteries; increased

emission testing of vehicles which may result in construction of new testing centers to monitor vehicle emissions throughout the State. It is anticipated that the replacement rate of on-road light-duty and heavy-duty vehicles, as well as off-road equipment and engines, would be increased, requiring that older models are sold outside of California, scrapped, or recycled. Compliance responses could also include construction and operation of new manufacturing facilities to support near-zero and zero-emission technologies and increased manufacturing of low-NOx engines. Finally, increased Low-Emission Diesel demand stimulated by implementation of an Low-Emission Diesel standard is anticipated to increase cultivation or imports of Low-Emission Diesel fuels or feedstocks, including renewable hydrocarbon diesel (more commonly known as renewable diesel) from feedstocks such as oil seeds and tallow; ~~and/or~~ compressed or liquefied renewable Low-Emission Diesel fuels from gas to liquid processing of biomethane or forest residues; biodiesel and/or other Low-Emission Diesel fuels. In addition, increased Low-Emission Diesel demand may increase processing of Low-Emission Diesel fuels, and shipment of finished Low-Emission Diesel fuels and/or their feedstocks. Infrastructure to support collection, processing, and distribution of Low-Emission Diesel fuels, including biomethane, and associated feedstocks may also increase.

No changes to the physical environment are anticipated that could result in adverse environmental effects for compliance responses associated with consumer products, as these could result in regulatory actions to limit ROG emission from consumer products. This may change the types of chemicals currently used; however, evaluation would occur on a case-by-case basis as data reporting and review must first be completed to determine which products may be subject to ROG reduction measures.

In addition, the State SIP Strategy includes petitioning the U.S. EPA for various regulatory changes, such as federal-low NOx emission standards for heavy-duty engines, and for the development of more stringent national locomotive emission standards. These actions involve federal (U.S. EPA) rulemaking and are not subject to ARB consideration. It would therefore be speculative for this ~~Draft~~ Final EA to attempt to analyze the impacts of potential compliance responses associated with measures that are subject to U.S. EPA development and review. Note that if U.S. EPA undertakes these federal rulemaking actions, it would complete the appropriate environmental analysis at the federal level.

Reductions in criteria air pollutants throughout the state could result from the use of autonomous vehicles, intelligent transportation systems, sustainable communities strategies, and roadway modifications. However, the State SIP Strategy would not be driving these actions, and they would be implemented through other programs. Thus, they are not considered to be reasonably foreseeable compliance responses related to implementation of the State SIP Strategy and environmental impacts related to these activities is not discussed in this ~~Draft~~ Final EA.

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3.0 ENVIRONMENTAL AND REGULATORY SETTING

The California Environmental Quality Act (CEQA) Guidelines require an environmental impact report (EIR) to include an environmental setting section that discusses the current environmental conditions in the vicinity of the project. This environmental setting normally constitutes the baseline physical conditions against which an impact is compared to determine whether or not it is significant (Cal. Code Regs., tit. 14 § 15125). As discussed in Chapter 1 of this Draft Final EA, the California Air Resources Board (ARB or Board) has a CEQA certified regulatory program and prepares an environmental analysis in lieu of an EIR. This Draft Final EA is a functional equivalent to an EIR under CEQA therefore, in an effort to comply with the policy objectives of CEQA, an environmental setting and a regulatory setting with environmental laws and regulations relevant to the Proposed Regulation have been included as Attachment 1 to this Draft Final EA.

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4.0 Impact Analysis and Mitigation

1. Aesthetics

Impacts 1-1: Short-Term Construction-Related and Long-Term Operational-Related Effects to Aesthetics

Reasonably foreseeable compliance responses associated with the State SIP Strategy include: increased infrastructure for natural gas and hydrogen refueling stations; increased demand for lithium battery manufacturing and associated increases in lithium mining and exports; increased recycling or refurbishment of lithium batteries; increased emission testing of vehicles which may cause construction of new testing centers to monitor vehicle emissions throughout the State. It is anticipated that the replacement rate of on-road light-duty and heavy-duty vehicles, as well as off-road equipment and engines, would be increased, requiring that older models are sold outside of California, scrapped, or recycled. Compliance responses could also include construction and operation of new manufacturing facilities to support near-zero and ~~near-zero~~ zero-emission technologies and increased manufacturing of low-NOx engines. Finally, increased Low-Emission Diesel demand stimulated by implementation of a Low-Emission Diesel standard is anticipated to increase cultivation or imports of Low-Emission Diesel fuels or feedstocks. In addition, increased Low-Emission Diesel demand may increase processing of Low-Emission Diesel fuels, and shipment of finished Low-Emission Diesel fuels and/or their feedstocks. Infrastructure to support collection, processing, and distribution of Low-Emission Diesel fuels, including biomethane, and associated feedstocks may also increase.

Landscape character can be defined as the visual and cultural image of a geographic area. It consists of the combination of physical, biological, and cultural attributes that make each landscape identifiable or unique. Visual character may range from predominately natural to heavily influenced by human development. Its value is related, in part, to the importance of a site to those who view it. Viewer groups typically include: residents, motorists, and recreation users.

Although it is reasonably foreseeable that activities associated with new or modified facilities could occur, there is uncertainty as to the exact location or character of any new facilities or modification of existing facilities. Some of the reasonably foreseeable compliance responses could be accomplished with minimal ground-disturbing activity. For instance, increased recycling and refurbishment of lithium batteries could be performed within existing recycling centers that undergo internal retrofitting. The outward appearance of such facilities would not require physical modifications that could degrade the visual character or quality of the surrounding area. Thus, visual impacts would not be substantial in these cases.

Development of new facilities, although expected to occur in areas appropriately zoned, could conceivably introduce or increase the presence of visible artificial elements (e.g., heavy-duty equipment, vegetation removal, new or expanded buildings) in areas of

scenic importance, such as visibility from a State scenic highway. The visual effects of such development would depend on several variables, including the type and size of facilities, distance and angle of view, visual prominence, and placement in the landscape. In addition, facility operation may introduce substantial sources of glare, exhaust plumes, and nighttime lighting for safety and security purposes.

Additionally, increased demand for vehicles powered by lithium batteries could cause a rise in lithium extraction activities. Naturally occurring lithium is primarily found in two forms: brine and hard rock. Hard rock (e.g., pegmatite) containing concentrations of lithium ore is extracted in open pits and underground hard rock mines using conventional mining techniques. Open pit mining often results in the removal of vegetation, soils, rocks, and other naturally occurring components of a landscape. Continental brines found in the groundwater of arid basins account for the primary source of lithium globally. With concentrations averaging between one and two percent, groundwater brine is pumped vertically into lagoons to evaporate leaving large piles of lithium salts at the surface. The process is considered less invasive than hard rock mining; however, the removal of groundwater without an established system of reinjection could cause plains to sink and dry out. This phenomenon could result in the deterioration of basin ecosystems and the endemic species they sustain. While mining for lithium would occur in appropriately zoned and/or permitted areas, it could adversely affect the visual quality and character of a landscape or scenic vista.

Therefore, short-term construction-related impacts and long-term operational impacts on aesthetics and nighttime lighting associated with implementation of the State SIP Strategy could be potentially significant. These impacts could be reduced to a less-than-significant level by mitigation that can and should be implemented by local lead agencies, but is beyond the authority of ARB and not within its purview.

Mitigation Measure 1-1

The Regulatory Setting in Attachment 1 includes applicable laws and regulations that provide protection of aesthetic resources. ARB does not have the authority to require implementation of mitigation related to new or modified facilities or infrastructure that would be approved by other State agencies or local jurisdictions. The ability to require such measures is within the purview of jurisdictions with land use approval and/or permitting authority. Project-specific impacts and mitigation would be identified during the project review process carried out by agencies with approval authority. Recognized practices routinely required to avoid and/or minimize impacts to aesthetic resources include:

- Proponents of new or modified facilities or infrastructure constructed as a result of reasonably foreseeable compliance responses would coordinate with State or local land use agencies to seek entitlements for development including the completion of all necessary environmental review requirements (e.g., CEQA). The local or State land use agency or

governing body must follow all applicable environmental regulations as part of approval of a project for development.

- Based on the results of the environmental review, proponents would implement all feasible mitigation to reduce or substantially lessen the potentially significant scenic or aesthetic impacts of the project.

- The project proponent would color and finish the surfaces of all project structures and buildings visible to the public to: (1) minimize visual intrusion and contrast by blending with the landscape; (2) minimize glare; and (3) comply with local design policies and ordinances. The project proponent would submit a surface treatment plan to the lead agency for review and approval.

- To the extent feasible, the sites selected for use as construction staging and laydown areas would be areas that are already disturbed and/or are in locations of low visual sensitivity. Where feasible, construction staging and laydown areas for equipment, personal vehicles, and material storage would be sited to take advantage of natural screening opportunities provided by existing structures, topography, and/or vegetation. Temporary visual screens would be used where helpful, if existing landscape features did not screen views of the areas.

- All construction, operation, and maintenance areas would be kept clean and tidy, including the re-vegetation of disturbed soil and storage of construction materials and equipment would be screened from view and/or are generally not visible to the public, where feasible.

- Siting projects and their associated elements next to important scenic landscape features or in a setting for observation from State scenic highways, national historic sites, national trails, and cultural resources would be avoided to the greatest extent feasible.

- The project proponent would contact the lead agency to discuss the documentation required in a lighting mitigation plan, submit to the lead agency a plan describing the measures that demonstrate compliance with lighting requirements, and notify the lead agency that the lighting has been completed and is ready for inspection.

Because the authority to determine project-level impacts and require project-level mitigation lies with land use and/or permitting agencies for individual projects, and the programmatic level of analysis associated with this ~~Draft~~ Final EA does not attempt to address project-specific details of mitigation, there is inherent uncertainty in the degree of mitigation that may ultimately by implemented to reduce potentially significant scenic and nighttime lighting impacts.

Consequently, while impacts could be reduced to a less-than-significant level by land use and/or permitting agency conditions of approval, this ~~Draft~~ Final EA takes the conservative approach in its post-mitigation significance conclusion and discloses, for CEQA compliance purposes, that short-term construction-related and long-term operational scenic and nighttime lighting impacts associated with the State SIP Strategy would be **potentially significant and unavoidable**.

2. Agricultural and Forest Resources

Impact 2-1: Short-Term Construction-Related and Long-Term Operational-Related Effects to Agricultural and Forest Resources

Reasonably foreseeable compliance responses associated with the State SIP Strategy include: increased infrastructure for natural gas and hydrogen refueling stations; increased demand for lithium battery manufacturing and associated increases in lithium mining and exports; increased recycling or refurbishment of lithium batteries; increased emission testing of vehicles which may cause construction of new testing centers to monitor vehicle emissions throughout the State. It is anticipated that the replacement rate of on-road light-duty and heavy-duty vehicles, as well as off-road equipment and engines, would be increased, requiring that older models are sold outside of California, scrapped, or recycled. Compliance responses could also include construction and operation of new manufacturing facilities to support near-zero and ~~near-~~zero-emission technologies and increased manufacturing of low-NOx engines. Finally, increased Low-Emission Diesel demand stimulated by implementation of a Low-Emission Diesel standard is anticipated to increase cultivation or imports of Low-Emission Diesel fuels or feedstocks. In addition, increased Low-Emission Diesel demand may increase processing of Low-Emission Diesel fuels, and shipment of finished Low-Emission Diesel fuels and/or their feedstocks. Infrastructure to support collection, processing, and distribution of Low-Emission Diesel fuels, including biomethane, and associated feedstocks may also increase.

Low-Emission Diesel fuels would be subject to the LCFS Regulation. This regulation requires evaluation of a fuel's carbon intensity (CI) value. A fuels CI is determined by evaluating the direct and indirect GHG emissions over the fuel's life cycle. The direct emissions that are a result of fuel production, transportation, distribution, and consumption are calculated for each step in the fuel pathway. For example, these steps may involve the following activities needed for the production of soy biodiesel:

- Farming practices (e.g., frequency and type of fertilizer used);
- Crop yields;
- Carbon dioxide absorbed by the crop;
- Collection and transportation of the crop;
- Type of fuel production;
- Fuel used in the production (e.g., coal, biomass);

- Energy efficiency of the production;
- Co-products generated that may be applied to other uses;
- Transport and distribution of the fuel; and
- Combustion of the fuel in vehicles.

Direct and indirect emissions that result from the change in land use or other market-mediated outcomes of fuel production or consumption are also evaluated and reflected in the fuel CI value. For some crop-based biofuels, land use changes may be a substantial source of additional GHG emissions. As described under Section 2.C.5, CI values for Low-Emission Diesel fuels would be limited to a maximum of 30-60 gCO2e/MJ. This limits the extent to which agricultural and forest resources could be affected by increased demand for low-emission diesel fuels. Nonetheless, increased Low-Emission Diesel feedstock production could alter the location and extent of fuel-based agricultural feedstock cultivation and production. Demand for Low-Emission Diesel feedstock could displace food-based production on agricultural land currently used for row crops, orchards, and grazing. This increased demand could potentially result in indirect land use changes where food-based agriculture could shift to other areas; thereby, increasing pressure for conversion of rangeland, grassland, forests, and other uses to agriculture.

Additional reasonably foreseeable compliance responses that could affect agricultural and forest resources are associated with transportation improvements and new manufacturing facilities, testing centers, hydrogen fueling stations and electric charging stations. However, it would be expected that new manufacturing facilities, feedstock processing facilities, testing centers, and infrastructure related to zero and near-zero technologies would be constructed in appropriately zoned areas or areas of consistent zoning.

If facilities or transportation improvements are proposed in response to the State SIP Strategy, potential impacts to Prime Farmland, Unique Farmland, Farmland of Statewide Importance, Williamson Act conservation contracts, forest land or timberland, must be reviewed by local or State lead agencies in the context of future project approvals. Many local governments have adopted land use policies to protect important agricultural and forest land from conversion to urban development, including industrial facilities. While it is reasonable to anticipate that land use policies controlling the location of new industrial facilities would generally avoid conversion of important agricultural land, the potential cannot be entirely dismissed. If a facility were located on important farmland or property under a Williamson Act Contract, conversion of the agricultural land to urban uses could occur.

Therefore, impacts associated with implementation of the State SIP Strategy on agricultural and forest resources could be potentially significant. These impacts could be reduced to a less-than-significant level by mitigation that can and should be

implemented by local lead agencies, but is beyond the authority of ARB and not within its purview.

Mitigation Measure 2-1

The Regulatory Setting in Attachment 1 includes applicable laws and regulations that provide protection of agricultural and forest resources. ARB does not have the authority to require implementation of mitigation related to new or modified facilities or infrastructure that would be approved by other State agencies or local jurisdictions. The ability to require such measures is within the purview of jurisdictions with land use approval and/or permitting authority. Project-specific impacts and mitigation would be identified during the project review process and carried out by agencies with approval authority. Recognized practices routinely required to avoid and/or minimize impacts to agriculture and forest resources include:

- Proponents of new or modified facilities constructed as a result of reasonably foreseeable compliance responses would coordinate with local or State land use agencies to seek entitlements for development including the completion of all necessary environmental review requirements (e.g., CEQA). The local or State land use agency or governing body must follow all applicable environmental regulations as part of approval of a project for development.

- Based on the results of the environmental review, proponents would implement all feasible mitigation to reduce or substantially lessen the environmental impacts of the project. Because ARB has no land use authority, mitigation is not within its purview to reduce potentially significant impacts to less-than-significant levels. Any mitigation specifically required for a new or modified facility would be determined by the local lead agency and future environmental documents by local and State lead agencies should include analysis of the following:

  - Avoidance of lands designated as Important Farmlands (State defined Prime Farmland, Farmland of Statewide Importance, and Unique Farmland) as defined by the Farmland Mapping and Monitoring Program.
  - Analysis of the feasibility of using farmland that is not designated as Important Farmland prior to deciding on the conversion of Important Farmland.
  - The feasibility, proximity, and value of the proposed project sites should be balanced before a decision is made to locate a facility on land designated as Important Farmland.
  - Any action resulting in the conversion of Important Farmlands should consider mitigation for the loss of such farmland. Any such mitigation should be completed prior to the issuance of a grading or building

permit by providing the permitting agency with written evidence of completion of the mitigation. Mitigation may include but is not limited to:

- Permanent preservation of off-site Important Farmland (State defined Prime Farmland, Farmland of Statewide Importance, and Unique Farmland) of equal or better agricultural quality, at a ratio of at least 1:1.
- Preservation may include the purchase of agricultural conservation easement(s); purchase of credits from an established agricultural farmland mitigation bank; contribution of agricultural land or equivalent funding to an organization that provides for the preservation of farmland towards the ultimate purchase of an agricultural conservation easement.
- Participation in any agricultural land mitigation program, including local government maintained, that provides equal or more effective mitigation than the measures listed.

Because the authority to determine project-level impacts and require project-level mitigation lies with land use and/or permitting agencies for individual projects, and the programmatic level of analysis associated with this ~~Draft~~ Final EA does not attempt to address project-specific details of mitigation, there is inherent uncertainty in the degree of mitigation that may ultimately by implemented to reduce potentially significant impacts related to the conversion of agriculture and forest resources.

Consequently, while impacts could be reduced to a less-than-significant level by land use and/or permitting agency conditions of approval, this ~~Draft~~ Final EA takes the conservative approach in its post-mitigation significance conclusion and discloses, for CEQA compliance purposes, that impacts to agriculture and forest resources resulting from the development of new facilities or modification of existing facilities associated with reasonably foreseeable compliance responses to the State SIP Strategy would be **potentially significant and unavoidable**.

3. Air Quality

Impact 3-1: Short-Term Construction-Related Effects to Air Quality

Reasonably foreseeable compliance responses associated with the State SIP Strategy include: increased infrastructure for natural gas and hydrogen refueling stations; increased demand for lithium battery manufacturing and associated increases in lithium mining and exports; increased recycling or refurbishment of lithium batteries; increased emission testing of vehicles which may cause construction of new testing centers to monitor vehicle emissions throughout the State. It is anticipated that the replacement rate of on-road light-duty and heavy-duty vehicles, as well as off-road equipment and engines, would be increased, requiring that older models are sold outside of California, scrapped, or recycled. Compliance responses could also include construction and

operation of new manufacturing facilities to support near-zero and ~~near-zero~~ zero-emission technologies and increased manufacturing of low-NOx engines. Finally, increased Low-Emission Diesel demand stimulated by implementation of a Low-Emission Diesel standard is anticipated to increase cultivation or imports of Low-Emission Diesel fuels or feedstocks. In addition, increased Low-Emission Diesel demand may increase processing of Low-Emission Diesel fuels, and shipment of finished Low-Emission Diesel fuels and/or their feedstocks. Infrastructure to support collection, processing, and distribution of Low-Emission Diesel fuels, including biomethane, and associated feedstocks may also increase.

Proposed development of new manufacturing facilities would be required to secure local or State land use approvals prior to their implementation. Part of the development review and approval process for projects located in California requires environmental review consistent with California environmental laws (e.g., CEQA) and other applicable local requirements (e.g., local air quality management district rules and regulations). The environmental review process would include an assessment of whether or not implementation of such projects could result in short-term construction-related air quality impacts.

At this time, the specific location, type, and number of construction activities is not known and would be dependent upon a variety of factors that are not within the control or authority of ARB and not within its purview. Nonetheless, the analysis presented herein provides a good-faith disclosure of the general types of construction emission impacts that could occur with implementation of these reasonably foreseeable compliance responses. Further, subsequent environmental review would be conducted at such time that an individual project is proposed and land use or construction approvals are sought.

It is generally expected that during the construction phase for any facilities, CAPs and TACs could be generated from a variety of activities and emission sources. These emissions would be temporary and occur intermittently depending on the intensity of construction on a given day. Site grading and excavation activities would generate fugitive PM dust emissions, which is the primary pollutant of concern during construction. Fugitive PM dust emissions (i.e., respirable particulate matter [PM10 and PM2.5]) vary as a function of several parameters, such as soil silt content and moisture, wind speed, acreage of disturbance area, and the intensity of activity performed with construction equipment. Exhaust emissions from off-road construction equipment, material delivery trips, and construction worker-commute trips could also contribute to short-term increases in PM emissions, but to a lesser extent. Exhaust emissions from construction-related mobile sources also include ROG and NOx. These emission types and associated levels fluctuate greatly depending on the particular type, number, and duration of usage for the varying equipment.

The site preparation phase typically generates the most substantial emission levels because of the on-site equipment and ground-disturbing activities associated with

grading, compacting, and excavation. Site preparation equipment and activities typically include backhoes, bulldozers, loaders, and excavation equipment (e.g., graders and scrapers). Although detailed construction information is not available at this time, based on the types of activities that could be conducted, it would be expected that the primary sources of construction-related emissions include soil disturbance- and equipment-related activities (e.g., use of backhoes, bulldozers, excavators, and other related equipment). Based on typical emission rates and other parameters for above- mentioned equipment and activities, construction activities could result in hundreds of pounds of daily NOx and PM emissions (amount generated from two to four pieces of heavy-duty equipment working eight hours per day), which may exceed general mass emissions limits of a local or regional air quality management district depending on the location of the emissions. Thus, implementation of new regulations and/or incentives could generate levels that conflict with applicable air quality plans, exceed or contribute substantially to an existing or projected exceedance of State or national ambient air quality standards, or expose sensitive receptors to substantial pollutant concentrations.

As a result, short-term construction-related air quality impacts associated with the State SIP Strategy would be potentially significant. However, all projects, regardless of their size or type, would be required to seek any applicable local or State land use approvals prior to their implementation.

These short-term construction-related air quality impacts could be reduced to a less-than-significant level by mitigation that can and should be implemented by local lead agencies, but is beyond the authority of ARB.

Mitigation Measure 3-1

The Regulatory Setting in Attachment 1 includes applicable laws and regulations that provide protection of air quality. ARB does not have the authority to require implementation of mitigation related to new or modified facilities that would be approved by local jurisdictions. The ability to require such measures is within the purview of jurisdictions with local or State land use approval and/or permitting authority. New or modified facilities in California would likely qualify as a “project” under CEQA, because they would generally need a discretionary public agency approval and could affect the physical environment. The jurisdiction with primary approval authority over a proposed action is the Lead Agency, which is required to review the proposed action for compliance with CEQA. Project-specific impacts and mitigation would be identified during the environmental review by agencies with project-approval authority. Recognized practices routinely required to avoid and/or minimize impacts to air quality include the following:

- Proponents of new or modified facilities or infrastructure constructed as a result of reasonably foreseeable compliance responses would coordinate with State or local land use agencies to seek entitlements for development including the completion of all necessary environmental review

requirements (e.g., CEQA). The local or State land use agency or governing body must follow all applicable environmental regulations as part of approval of a project for development.

- Based on the results of the environmental review, proponents would implement all feasible mitigation to reduce or substantially lessen the potentially significant scenic or aesthetic impacts of the project.
- Project proponents would apply for, secure, and comply with all appropriate air quality permits for project construction from the local agencies with air quality jurisdiction and from other applicable agencies, if appropriate, prior to construction mobilization.
- Project proponents would comply with the federal Clean Air Act (The Act) and the California Clean Air Act (e.g., New Source Review and Best Available Control Technology criteria, if applicable).
- Project proponents would comply with local plans, policies, ordinances, rules, and regulations regarding air quality-related emissions and associated exposure (e.g., construction-related fugitive PM dust regulations, indirect source review, and payment into offsite mitigation funds).
- For projects located in PM nonattainment areas, prepare and comply with a dust abatement plan that addresses emissions of fugitive dust during construction and operation of the project.

Because the authority to determine project-level impacts and require project-level mitigation lies with land use and/or permitting agencies for individual projects, and the programmatic level of analysis associated with this ~~Draft~~ Final EA does not attempt to address project-specific details of mitigation, there is inherent uncertainty in the degree of mitigation that may ultimately be implemented to reduce potentially significant impacts. With mitigation, construction emissions, though not likely, could still exceed local air district threshold levels of significance depending on the magnitude of construction

Consequently, while impacts could be reduced to a less-than-significant level by land use and/or permitting agency conditions of approval, this ~~Draft~~ Final EA takes the conservative approach in its post-mitigation significance conclusion and discloses, for CEQA compliance purposes, that short-term construction-related air quality impacts resulting from compliance responses associated with the State SIP Strategy would be **potentially significant and unavoidable**.

Impact 3-2: Long-Term Operational-Related Effects to Air Quality

Reasonably foreseeable compliance responses associated with the State SIP Strategy include operation of new manufacturing facilities to support increased market

penetration of PHEV, non-combustion ZEV including BEVs and hydrogen FCEV zero-emission technologies, and electric-powered equipment (e.g., forklifts). Increased use of near-zero and zero-emission technologies may result in increased infrastructure for natural gas and hydrogen refueling and charging stations, and increased demand for lithium battery manufacturing and associated increases in lithium mining and exports. New testing centers to monitor vehicle emissions may be operated throughout the State. In addition, increased Low-Emission Diesel demand stimulated by implementation of a Low-Emission Diesel standard is anticipated to increase cultivation or imports of Low-Emission Diesel fuels or feedstocks. In addition, increased Low-Emission Diesel demand may increase processing of Low-Emission Diesel fuels, and shipment of finished Low-Emission Diesel fuels and/or their feedstocks. Infrastructure to support collection, processing, and distribution of Low-Emission Diesel fuels, including biomethane, and associated feedstocks may also increase.

As discussed in more detail in the State SIP Strategy the proposed measures would result in substantial long-term reductions in criteria and toxic air pollutants. Statewide, implementation of the State SIP Strategy is anticipated to result in emission reductions of 206 tons per day of NOx, 87 tons per day ROG and 2 tons per day of PM2.5.

The proposed measures within the State SIP Strategy are designed to result in substantial long-term reductions in criteria and toxic air pollutants, although it is possible that certain aspects of the State SIP Strategy may cause comparatively small emission increases. These potential incremental increases would be offset by the overall substantial long-term reductions in criteria and toxic air pollutants. As a result, long-term operational impacts related to air quality would be **beneficial**.

4. Biological Resources

Impact 4-1: Short-Term Construction-Related Effects to Biological Resources

Reasonably foreseeable compliance responses associated with the State SIP Strategy include: increased infrastructure for natural gas and hydrogen refueling stations; increased demand for lithium battery manufacturing and associated increases in lithium mining and exports; increased recycling or refurbishment of lithium batteries; increased emission testing of vehicles which may cause construction of new testing centers to monitor vehicle emissions throughout the State. It is anticipated that the replacement rate of on-road light-duty and heavy-duty vehicles, as well as off-road equipment and engines, would be increased, requiring that older models are sold outside of California, scrapped, or recycled. Compliance responses could also include construction and operation of new manufacturing facilities to support near-zero and ~~near-zero~~ zero-emission technologies and increased manufacturing of low-NOx engines. Finally, increased Low-Emission Diesel demand stimulated by implementation of a Low-Emission Diesel standard is anticipated to increase cultivation or imports of Low-Emission Diesel fuels or feedstocks. In addition, increased Low-Emission Diesel demand may increase processing of Low-Emission Diesel fuels, and shipment of finished Low-Emission Diesel fuels and/or their feedstocks. Infrastructure to support

collection, processing, and distribution of Low-Emission Diesel fuels, including biomethane, and associated feedstocks may also increase.

Although it is reasonably foreseeable that construction activities could occur for these types of activities, there is uncertainty as to the exact location of any new facilities or modification made to existing facilities. Any construction undertaken could require disturbance of undeveloped areas, such as clearing of vegetation, earth movement and grading, trenching for utility lines, erection of new buildings and infrastructure, and paving of parking lots, delivery areas, and roadways.

The biological resources that could be affected by the construction of new manufacturing plants, biofuel facilities, or near-zero and ~~near-zero~~ zero-emission-related infrastructure would depend on the specific location of any necessary construction and its environmental setting, which is anticipated to mostly occur within existing disturbed commercial and industrial areas. Additionally, increased demand for biofuel feedstock production could result in expansion of agricultural lands into undeveloped areas, or areas that otherwise support biological resources. Adverse impacts could include modifications to existing habitat; including removal, degradation, and fragmentation of riparian systems, wetlands, or other sensitive natural wildlife habitat and plant communities; interference with wildlife movement or wildlife nursery sites; loss of special-status species; and/or conflicts with the provisions of adopted habitat conservation plans, natural community conservation plans, or other conservation plans or policies to protect natural resources.

Short-term construction-related impacts to biological resources associated with the State SIP Strategy would be potentially significant.

These impacts on biological resources associated with the State SIP Strategy could be reduced to a less-than-significant level by mitigation that can and should be implemented by local lead agencies, but is beyond the authority of ARB and not within its purview.

Mitigation Measure 4-1

The Regulatory Setting in Attachment 1 includes applicable laws and regulations that provide protection of biological resources. ARB does not have the authority to require implementation of mitigation related to new or modified facilities that would be approved by local jurisdictions. The ability to require such measures is under the purview of jurisdictions with local or State land use approval and/or permitting authority. New or modified facilities in California would qualify as a “project” under CEQA. The jurisdiction with primary approval authority over a proposed action is the Lead Agency, which is required to review the proposed action for compliance with CEQA statutes. Project-specific impacts and mitigation would be identified during the environmental review by agencies with project-approval authority. Recognized practices that are routinely required to avoid and/or minimize impacts to biological resources include:

- Proponents of new or modified facilities or infrastructure constructed as a result of reasonably foreseeable compliance responses would coordinate with State or local land use agencies to seek entitlements for development including the completion of all necessary environmental review requirements (e.g., CEQA). The local or State land use agency or governing body must follow all applicable environmental regulations as part of approval of a project for development.

- Based on the results of the environmental review, proponents would implement all feasible mitigation to reduce or substantially lessen the potentially significant scenic or aesthetic impacts of the project.

- Actions required to mitigate potentially significant biological impacts may include the following; however, any mitigation specifically required for a new or modified facility would be determined by the local lead agency.

    - Retain a qualified biologist to prepare a biological inventory of site resources prior to ground disturbance or construction. If protected species or their habitats are present, comply with applicable federal and State endangered species acts and regulations. Construction and operational planning will require that important fish or wildlife movement corridors or nursery sites are not impeded by project activities.

    - Retain a qualified biologist to prepare a wetland survey of onsite resources. This survey shall be used to establish setbacks and prohibit disturbance of riparian habitats, streams, intermittent and ephemeral drainages, and other wetlands. Wetland delineation is required by Section 404 of the Clean Water Act and is administered by the U.S. Army Corps of Engineers.

    - Prohibit construction activities during the rainy season with requirements for seasonal weatherization and implementation of erosion prevention practices.

    - Prohibit construction activities in the vicinity of raptor nests during nesting season or establish protective buffers and provide monitoring, as needed, to address project activities that could cause an active nest to fail.

    - Prepare site design and development plans that avoid or minimize disturbance of habitat and wildlife resources, and prevent stormwater discharge that could contribute to sedimentation and degradation of local waterways. Depending on disturbance size and location, a National Pollution Discharge Elimination System (NPDES) construction permit may be required from the California State Water Resources Control Board.

- Prepare spill prevention and emergency response plans, and hazardous waste disposal plans as appropriate to protect against the inadvertent release of potentially toxic materials.
- Plant replacement trees and establish permanent protection suitable habitat at ratios considered acceptable to comply with "no net loss" requirements.
- Contractor will keep the site and materials organized and store them in a way to prevent attracting wildlife by not creating places for wildlife to hide or nest (e.g., capping pipes, covering trashcans and emptying trash receptacles consistently and promptly when full).

Because the authority to determine project-level impacts and require project-level mitigation lies with land use and/or permitting agencies for individual projects, and the programmatic level of analysis associated with this ~~Draft~~ Final EA does not attempt to address project-specific details of mitigation, there is inherent uncertainty in the degree of mitigation that may ultimately be implemented to reduce potentially significant impacts.

Consequently, while impacts could be reduced to a less-than-significant level by land use and/or permitting agency conditions of approval, this ~~Draft~~ Final EA takes the conservative approach in its post-mitigation significance conclusion and discloses, for CEQA compliance purposes, that short-term construction-related impacts to biological resources associated with the State SIP Strategy would be **potentially significant and unavoidable**.

Impacts 4-2: Long-Term Operational-Related Effects to Biological Resources

Reasonably foreseeable compliance responses associated with the State SIP Strategy include operation of new manufacturing facilities to support increased market penetration of PHEV, non-combustion ZEV including BEVs and hydrogen FCEV zero-emission technologies, and electric-powered equipment (e.g., forklifts). Increased use of near-zero and ~~near-zero~~ zero-emission technologies may result in increased infrastructure for natural gas and hydrogen refueling and charging stations, and increased demand for lithium battery manufacturing and associated increases in lithium mining and exports. New testing centers to monitor vehicle emissions may be operated throughout the State. In addition, increased Low-Emission Diesel demand stimulated by implementation of a Low-Emission Diesel standard is anticipated to increase cultivation or imports of Low-Emission Diesel fuels or feedstocks. In addition, increased Low-Emission Diesel demand may increase processing of Low-Emission Diesel fuels, and shipment of finished Low-Emission Diesel fuels and/or their feedstocks. Infrastructure to support collection, processing, and distribution of Low-Emission Diesel fuels, including biomethane, and associated feedstocks may also increase.

Implementation of a Low-Emission Diesel standard would likely result in an increased demand for agricultural feedstocks, including oilseeds. In some cases, this increase can

be accomplished through the use of marginal lands (i.e., lands unsuitable for food crops), or through the increased production of feedstocks on existing agricultural lands (e.g., through the use of genetically modified crops designed for fuels). However, cultivation of biofuels on land currently used for food production could result in the conversion of additional existing forest, grassland, or other non-agricultural land to food-related agricultural uses. In addition, the use of distillers' grains for ethanol, which is often used to feed livestock, could increase pressure to grow additional crops for cattle and other animal-based agriculture. However, Low-Emission Diesel fuels would be subject to the LCFS regulation and related modeling requirements. Under the LCFS regulation, CI values for land use changes the production and use of renewable sources, such as waste-derived biofuels, and may decrease the potential for deforestation and other conversion of lands not currently in agricultural production. As a result, the potential for land use conversion, and the related effects on biological species, would be discouraged. However, land conversion and adverse effects on biological species and their habitats could occur due to increase agricultural feedstock demands.

Implementation of the State SIP Strategy would result in increased mining-related activities, including hard rock and continental brines for the procurement of lithium ore. Mining of hard rock would require the use of conventional mining practices including the creation of underground mines and open pits, which would result in the removal of organic material (e.g., bedrock, vegetation). Lithium may also be collected from continental brines found in basins. This process involves the pumping of salty groundwater into lagoons where it undergoes evaporation producing salts containing lithium compounds. Such activities could result in substantial disturbances to biological resources and could cause a reduction in sensitive habitat, interference with a wildlife corridor, loss of special-status species, or conflict with a habitat conservation plan or natural community conservation plan.

Long-term operational impacts to biological resources associated with the State SIP Strategy would be potentially significant.

Impacts to biological resources associated with the State SIP Strategy could be reduced to a less-than-significant level by mitigation that can and should be implemented by local lead agencies, but is beyond the authority of ARB and not within its purview.

Mitigation Measure 4-2: Implement Mitigation Measure 4-1

Because the authority to determine project-level impacts and require project-level mitigation lies with land use and/or permitting agencies for individual projects, and the programmatic level of analysis associated with this ~~Draft~~ Final EA does not attempt to address project-specific details of mitigation, there is inherent uncertainty in the degree of mitigation that may ultimately by implemented to reduce potentially significant impacts.

Consequently, while impacts could be reduced to a less-than-significant level by land use and/or permitting agency conditions of approval, this ~~Draft~~ Final EA takes the conservative approach in its post-mitigation significance conclusion and discloses, for CEQA compliance purposes, that long-term operational impacts to biological resources associated with the State SIP Strategy would be **potentially significant and unavoidable**.

5. Cultural Resources

Impact 5-1: Short-Term Construction-Related and Long-Term Operational Effects to Cultural Resources

Reasonably foreseeable compliance responses associated with the State SIP Strategy include: increased infrastructure for natural gas and hydrogen refueling stations; increased demand for lithium battery manufacturing and associated increases in lithium mining and exports; increased recycling or refurbishment of lithium batteries; increased emission testing of vehicles which may cause construction of new testing centers to monitor vehicle emissions throughout the State. It is anticipated that the replacement rate of on-road light-duty and heavy-duty vehicles, as well as off-road equipment and engines, would be increased, requiring that older models are sold outside of California, scrapped, or recycled. Compliance responses could also include construction and operation of new manufacturing facilities to support near-zero and ~~near-zero~~ zero-emission technologies and increased manufacturing of low-NOx engines. Finally, increased Low-Emission Diesel demand stimulated by implementation of a Low-Emission Diesel standard is anticipated to increase cultivation or imports of Low-Emission Diesel fuels or feedstocks. In addition, increased Low-Emission Diesel demand may increase processing of Low-Emission Diesel fuels, and shipment of finished Low-Emission Diesel fuels and/or their feedstocks. Infrastructure to support collection, processing, and distribution of Low-Emission Diesel fuels, including biomethane, and associated feedstocks may also increase.

Construction activities could require disturbance of undeveloped area, such as clearing of vegetation, earth movement and grading, trenching for utility lines, erection of new buildings, and paving of parking lots, delivery areas, and roadways. Demolition of existing structures may also occur before the construction of new buildings and structures. The cultural resources that could potentially be affected by ground disturbance activities include, but are not limited to, prehistoric and historical archaeological sites, tribal cultural resources, paleontological resources, historic buildings, structures, or archaeological sites associated with agriculture and mining, and heritage landscapes. Properties important to Native American communities and other ethnic groups, including tangible properties possessing intangible traditional cultural values, also may exist. Historic buildings and structures may also be adversely affected by demolition-related activities. Such resources may occur individually, in groupings of modest size, or in districts. Because culturally sensitive resources can also be located in developed settings; historic, archeological and paleontological resources, and places

important to Native American communities, could also be adversely affected by construction of new facilities.

Properties important to Native American communities and other ethnic groups, including tangible properties possessing intangible traditional cultural values, also may exist. Historic buildings and structures may also be adversely affected by demolition-related activities. Such resources may occur individually, in groupings of modest size, or in districts. Because culturally sensitive resources can also be located in developed settings, historic, archeological, and paleontological resources, and places important to Native American communities, could also be adversely affected by construction of new facilities.

New facilities constructed as a potential compliance response may be located in a region where significant prehistoric or historic-era cultural resources may have been recorded and there remains a potential that undocumented cultural resources could be unearthed or otherwise discovered during ground-disturbing and construction activities. Prehistoric materials might include flaked stone tools, tool-making debris, stone milling tools, shell or bone items, and fire affected rock or soil darkened by cultural activities; examples of significant discoveries would include villages and cemeteries. Historic material might include metal, glass, or ceramic artifacts; examples of significant discoveries might include former privies or refuse pits (middens).

Due to the possible presence of undocumented cultural resources and paleontological resources, short-term construction-related and long-term operational impacts on cultural resources associated with the State SIP Strategy would be potentially significant.

These impacts could be reduced to a less-than-significant level by mitigation that can and should be implemented by local lead agencies, but is beyond the authority of ARB and not within its purview.

Mitigation Measure 5-1

The Regulatory Setting in Attachment 1 includes applicable laws and regulations that provide protection of cultural resources. ARB does not have the authority to require implementation of mitigation related to new or modified facilities that would be approved by local jurisdictions. The ability to require such measures is under the purview of jurisdictions with local or State land use approval and/or permitting authority. New or modified facilities in California would qualify as a “project” under CEQA. The jurisdiction with primary approval authority over a proposed action is the Lead Agency, which is required to review the proposed action for compliance with CEQA statutes. Project-specific impacts and mitigation would be identified during the environmental review by agencies with project-approval authority. Recognized practices that are routinely required to avoid and/or minimize impacts to cultural resources include:

- Proponents of new or modified facilities or infrastructure constructed as a result of reasonably foreseeable compliance responses would coordinate

with State or local land use agencies to seek entitlements for development including the completion of all necessary environmental review requirements (e.g., CEQA). The local or State land use agency or governing body must follow all applicable environmental regulations as part of approval of a project for development.

- Based on the results of the environmental review, proponents would implement all feasible mitigation to reduce or substantially lessen the potentially significant scenic or aesthetic impacts of the project. Actions required to mitigate potentially significant cultural impacts may include the following; however, any mitigation specifically required for a new or modified facility would be determined by the local lead agency.
  - Retain the services of cultural resources specialists with training and background that conforms to the U.S. Secretary of Interior's Professional Qualifications Standards, as published in Title 36, Code of Federal Regulations, part 61.
  - Seek guidance from the State and federal lead agencies, as appropriate, for coordination of Nation-to-Nation consultations with the Native American Tribes.
  - Provide notice to Native American Tribes of project details to identify potential Tribal Cultural Resources (TCRs). In the case that a TRC is identified, prepare mitigation measures that:
    - Avoid and preserve the resources in place,
    - Treat the resource with culturally appropriate dignity,
    - Employ permanent conservation easements, and
    - Protect the resource.
  - Consult with lead agencies early in the planning process to identify the potential presence of cultural properties. The agencies will provide the project developers with specific instruction on policies for compliance with the various laws and regulations governing cultural resources management, including coordination with regulatory agencies and Native American Tribes.
  - Define the area of potential effect (APE) for each project, which is the area within which project construction and operation may directly or indirectly cause alterations in the character or use of historic properties. The APE should include a reasonable construction buffer zone and laydown areas, access roads, and borrow areas, as well as a reasonable assessment of areas subject to effects from visual, auditory, or atmospheric impacts, or impacts from increased access.
  - Retain the services of a paleontological resources specialist with training and background that conforms with the minimum qualifications

for a vertebrate paleontologist as described in Measures for Assessment and Mitigation of Adverse Impacts to Non-Renewable Paleontologic Resources: Standard Procedures (Society of Vertebrate Paleontology 2010).

- Conduct initial scoping assessments to determine whether proposed construction activities would disturb formations that may contain important paleontological resources. Whenever possible potential impacts to paleontological resources should be avoided by moving the site of construction or removing or reducing the need for surface disturbance. The scoping assessment should be conducted by the qualified paleontological resources specialist in accordance with applicable agency requirements.
- The project proponent's qualified paleontological resources specialist would determine whether paleontological resources would likely be disturbed in a project area on the basis of the sedimentary context of the area and a records search for past paleontological finds in the area. The assessment may suggest areas of high known potential for containing resources. If the assessment is inconclusive a surface survey is recommended to determine the fossiliferous potential and extent of the pertinent sedimentary units within the project site. If the site contains areas of high potential for significant paleontological resources and avoidance is not possible, prepare a paleontological resources management and mitigation plan that addresses the following steps:
  - a preliminary survey (if not conducted earlier) and surface salvage prior to construction;
  - physical and administrative protective measures and protocols such as halting work, to be implemented in the event of fossil discoveries;
  - monitoring and salvage during excavation;
  - specimen preparation;
  - identification, cataloging, curation and storage; and
  - a final report of the findings and their significance.

Because the authority to determine project-level impacts and require project-level mitigation lies with the land use approval and/or permitting agency for individual projects, and that the programmatic analysis does not allow project-specific details of mitigation, there is inherent uncertainty in the degree of mitigation ultimately implemented to reduce the potentially significant impacts.

Consequently, while impacts could be reduced to a less-than-significant level by land use and/or permitting agency conditions of approval, this ~~Draft~~ Final EA takes the

conservative approach in its post-mitigation significance conclusion and discloses, for CEQA compliance purposes, that short-term construction-related and long-term operational cultural resources impacts associated with the State SIP Strategy could be **potentially significant and unavoidable**.

6. Energy Demand

Impact 6-1: Short-Term Construction-Related Impacts on Energy Demand

Reasonably foreseeable compliance responses associated with the State SIP Strategy include: increased infrastructure for natural gas and hydrogen refueling stations; increased demand for lithium battery manufacturing and associated increases in lithium mining and exports; increased recycling or refurbishment of lithium batteries; increased emission testing of vehicles which may cause construction of new testing centers to monitor vehicle emissions throughout the State. It is anticipated that the replacement rate of on-road light-duty and heavy-duty vehicles, as well as off-road equipment and engines, would be increased, requiring that older models are sold outside of California, scrapped, or recycled. Compliance responses could also include construction and operation of new manufacturing facilities to support near-zero and ~~near-zero~~ zero-emission technologies and increased manufacturing of low-NOx engines. Finally, increased Low-Emission Diesel demand stimulated by implementation of a Low-Emission Diesel standard is anticipated to increase cultivation or imports of Low-Emission Diesel fuels or feedstocks. In addition, increased Low-Emission Diesel demand may increase processing of Low-Emission Diesel fuels, and shipment of finished Low-Emission Diesel fuels and/or their feedstocks. Infrastructure to support collection, processing, and distribution of Low-Emission Diesel fuels, including biomethane, and associated feedstocks may also increase.

Temporary increases in energy demand associated with new facilities would include fuels used during construction, and gas and electric demands. Typical earth-moving equipment that may be necessary for construction includes: graders, scrapers, backhoes, jackhammers, front-end loaders, generators, water trucks, and dump trucks. While energy would be required to complete construction for any new or modified facilities or infrastructure projects, it would be temporary and limited in magnitude such that a reasonable amount of energy would be expended.

Short-term construction-related impacts on energy demand, associated with the State SIP Strategy, would be **less-than-significant**.

Impact 6-2: Long-Term Operational Impacts on Energy Demand

In the long term, implementation of the State SIP Strategy would be anticipated to result in a shift away from petroleum-based fuels toward electricity for cars, trucks, and other mobile equipment. For passenger vehicles, the State SIP Strategy calls for increasing the penetration of PHEV, and non-combustion ZEVs including BEV and hydrogen FCEV by over 50 percent compared to current programs. The electrical grid and hydrogen supply supporting these electric vehicles would need to represent 50 percent renewable

energy generation by 2030, as required by the Clean Energy and Pollution Reduction Act of 2015. A large portion of the liquid fuels for combustion engine vehicles would also need to be sourced from renewable feedstock.

Implementation of the State SIP Strategy would effectively shift the use of petroleum-based fuels (i.e., gasoline and CARB diesel) to battery-electric, hydrogen and natural gas. It would also increase the demand and supply of Low-Emission Diesel fuels. However, compliance responses associated with the State SIP Strategy would not affect the number of vehicles and need for energy supplies.

According to Appendix F of the CEQA Guidelines (Cal. Code Regs., tit. 14, § 15000 et seq.), the wise and efficient use of energy includes:

1. Decreasing overall per capita energy consumption;
2. Decreasing reliance on fossil fuel such as coal, natural gas, and oil; and
3. Increasing reliance on renewable energy sources.

Implementation of the State SIP Strategy would increase the amount of renewable energy supplies because vehicular fuels would increase the use of electricity (50 percent of which would be renewable by 2030), and decrease the use of petroleum through increased use of PHEVs, ZEVs, and Low-Emission Diesel fuels. Thus, the State SIP Strategy would support wise and efficient uses of energy, and would result in a **beneficial** long-term operational impact on energy demand.

7. Geology and Soils

Impact 7-1: Short-Term Construction-Related and Long-Term Operational Effects on Geology, Seismicity, and Soils

Reasonably foreseeable compliance responses associated with the State SIP Strategy include: increased infrastructure for natural gas and hydrogen refueling stations; increased demand for lithium battery manufacturing and associated increases in lithium mining and exports; increased recycling or refurbishment of lithium batteries; increased emission testing of vehicles which may cause construction of new testing centers to monitor vehicle emissions throughout the State. It is anticipated that the replacement rate of on-road light-duty and heavy-duty vehicles, as well as off-road equipment and engines, would be increased, requiring that older models are sold outside of California, scrapped, or recycled. Compliance responses could also include construction and operation of new manufacturing facilities to support near-zero and ~~near-zero~~ zero-emission technologies and increased manufacturing of low-NOx engines. Finally, increased Low-Emission Diesel demand stimulated by implementation of a Low-Emission Diesel standard is anticipated to increase cultivation or imports of Low-Emission Diesel fuels or feedstocks. In addition, increased Low-Emission Diesel demand may increase processing of Low-Emission Diesel fuels, and shipment of finished Low-Emission Diesel fuels and/or their feedstocks. Infrastructure to support

collection, processing, and distribution of Low-Emission Diesel fuels, including biomethane, and associated feedstocks may also increase.

Although it is reasonably foreseeable that construction and operational activities could occur, there is uncertainty as to the exact location of any new facilities or modification of existing facilities. Construction activities could require disturbance of undeveloped areas, such as clearing of vegetation, earth movement and grading, trenching for utility lines, erection of new buildings, and paving of parking lots, delivery areas, and roadways. Additional disturbance could result from the increased mineral ore extraction activities which would provide raw materials to these manufacturing facilities and energy projects. These activities would have the potential to adversely affect soil and geologic resources in construction or mineral ore extraction areas.

New facilities and infrastructure could be located in a variety of geologic, soil, and slope conditions with varying amounts of vegetation that would be susceptible to soil compaction, soil erosion, and loss of topsoil during construction. The level of susceptibility varies by location. However, the specific design details, siting locations, and soil compaction and erosion hazards for particular manufacturing facilities are not known at this time and would be analyzed on a site-specific basis at the project level.

Short-term construction-related and long-term operational impacts to geology and soils associated with the State SIP Strategy would be potentially significant.

The impacts to geology and soil resources could be reduced to a less-than-significant level by mitigation that can and should be implemented by federal, State, and local lead agencies, but is beyond the authority of ARB and not within its purview.

Mitigation Measure 7-1

The Regulatory Setting in Attachment 1 includes applicable laws and regulations that provide protection of geology and soils. ARB does not have the authority to require implementation of mitigation related to new or modified facilities that would be approved by local jurisdictions. The ability to require such measures is under the purview of jurisdictions with local or State land use approval and/or permitting authority. New or modified facilities in California would qualify as a “project” under CEQA. The jurisdiction with primary approval authority over a proposed action is the Lead Agency, which is required to review the proposed action for compliance with CEQA statutes. Project-specific impacts and mitigation would be identified during the environmental review by agencies with project-approval authority. Recognized practices that are routinely required to avoid and/or minimize impacts to geology and soils include:

- Proponents of new or modified facilities or infrastructure constructed as a result of reasonably foreseeable compliance responses would coordinate with State or local land use agencies to seek entitlements for development including the completion of all necessary environmental review requirements (e.g., CEQA). The local or State land use agency or

governing body must follow all applicable environmental regulations as part of approval of a project for development.

- Based on the results of the environmental review, proponents would implement all feasible mitigation to reduce or substantially lessen the potentially significant scenic or aesthetic impacts of the project. Actions required to mitigate potentially significant geology and soil impacts may include the following; however, any mitigation specifically required for a new or modified facility would be determined by the local lead agency.
  - Prior to the issuance of any development permits, proponents of new or modified facilities or infrastructure would prepare a geotechnical investigation/study, which would include an evaluation of the depth to the water table, liquefaction potential, physical properties of subsurface soils including shrink-swell potential (expansion), soil resistivity, slope stability, mineral resources, and the presence of hazardous materials.
  - Proponents of new or modified facilities or infrastructure would provide a complete site grading plan, and drainage, erosion, and sediment control plan with applications to applicable lead agencies. Proponents would avoid locating facilities on steep slopes, in alluvial fans and other areas prone to landslides or flash floods, or with gullies or washes, as much as possible.
  - Disturbed areas outside of the permanent construction footprint would be stabilized or restored using techniques such as soil loosening, topsoil replacement, revegetation, and surface protection (i.e., mulching).

Because the authority to determine project-level impacts and require project-level mitigation lies with the land use approval and/or permitting agency for individual projects, and that the programmatic analysis does not allow project-specific details of mitigation, there is inherent uncertainty in the degree of mitigation ultimately implemented to reduce the potentially significant impacts.

Consequently, while impacts could be reduced to a less-than-significant level by land use and/or permitting agency conditions of approval, this ~~Draft~~ Final EA takes the conservative approach in its post-mitigation significance conclusion and discloses, for CEQA compliance purposes, that short-term construction and long-term operational impacts to geology and soil resources associated with the State SIP Strategy would be **potentially significant and unavoidable**.

8. Greenhouse Gases

Impact 8-1: Short-Term Construction-Related and Long-Term Operational Greenhouse Gas Impacts

Reasonably foreseeable compliance responses associated with the State SIP Strategy include: increased infrastructure for natural gas and hydrogen refueling stations; increased demand for lithium battery manufacturing and associated increases in lithium mining and exports; increased recycling or refurbishment of lithium batteries; increased emission testing of vehicles which may cause construction of new testing centers to monitor vehicle emissions throughout the State. It is anticipated that the replacement rate of on-road light-duty and heavy-duty vehicles, as well as off-road equipment and engines, would be increased, requiring that older models are sold outside of California, scrapped, or recycled. Compliance responses could also include construction and operation of new manufacturing facilities to support near-zero and ~~near-zero~~ zero-emission technologies and increased manufacturing of low-NOx engines. Finally, increased Low-Emission Diesel demand stimulated by implementation of a Low-Emission Diesel standard is anticipated to increase cultivation or imports of Low-Emission Diesel fuels or feedstocks. Increased Low-Emission Diesel demand may increase processing of Low-Emission Diesel fuels, and shipment of finished Low-Emission Diesel fuels and/or their feedstocks. Infrastructure to support collection, processing, and distribution of Low-Emission Diesel fuels, including biomethane, and associated feedstocks may also increase.

Overall, the State SIP Strategy would result in substantial long-term GHG reductions, although certain aspects of the State SIP Strategy would cause comparatively small short-term GHG emission increases.

Although it is reasonably foreseeable that construction activities associated with new or modified facilities could occur, there is uncertainty as to the exact location of any new facilities or the reconstruction or modification of existing facilities. Typical earth-moving equipment that may be necessary for these types of construction activities includes: graders, scrapers, backhoes, jackhammers, front-end loaders, generators, water trucks, and dump trucks. Specific, project-related construction activities would result in increased generation of GHG emissions associated with the use of heavy-duty off-road equipment, materials transport, and worker commutes for the duration of the construction phase. Therefore, construction-related GHG emissions are expected to be short-term and limited in amount.

Local agencies, such as air pollution control districts, are generally charged with determining acceptable thresholds of GHG emissions, measured in metric tons of carbon dioxide equivalent per year (MT CO_2e/year). Quantification of short-term construction-related GHG emissions is generally based on a combination of methods, including the use of exhaust emission rates from emissions models, such as OFFROAD 2007 and EMFAC 2011. These models require consideration of assumptions, including construction timelines and energy demands (e.g., fuel and

electricity). However, a majority of local agencies (e.g., air pollution control districts) do not recommend or require the quantification of short-term construction-generated GHGs for typical construction projects because these only occur for a finite period of time (e.g., during periods of construction) that is typically much shorter than the operational phase. Thus, local agencies generally recommended that GHG analyses focus on operational phase emissions, as discussed below, unless the project is of a unique nature requiring atypical (e.g., large scale, long-term) construction activity levels (e.g., construction of a new dam or levee) for which quantification and consideration (e.g., amortization of construction emissions over the lifetime of the project) may be recommended.

When these short-term construction-related GHG emissions associated with construction activities undertaken in response to the State SIP Strategy are considered in relation to the overall long-term operational GHG benefits discussed below, they are not considered substantial.

As the State SIP Strategy requires increased use of Low-Emission Diesel fuels in place of conventional hydrocarbon diesel, implementation is anticipated to result in a reduction in GHG emissions from transportation fuels used in California. The proposed Low-Emission Diesel fuel measure specifies that compliant fuels would reduce lifecycle CI (CO2e/MJ) by approximately 35 – 70% compared with conventional diesel. Thus, implementing the State SIP Strategy is anticipated to result in a reduction of GHG emissions for every gallon of Low-Emission Diesel consumed in place of conventional diesel. These benefits would be greater than a comparatively small level of GHG emissions related to construction and operation of facilities associated with the compliance responses, as described above. As a result, implementation of the proposed strategy would result in a **beneficial** impact to GHG emissions.

9. Hazards and Hazardous Materials

Impact 9-1: Short-Term Construction-Related Hazard Impacts

Reasonably foreseeable compliance responses associated with the State SIP Strategy include: increased infrastructure for natural gas and hydrogen refueling stations; increased demand for lithium battery manufacturing and associated increases in lithium mining and exports; increased recycling or refurbishment of lithium batteries; increased emission testing of vehicles which may cause construction of new testing centers to monitor vehicle emissions throughout the State. It is anticipated that the replacement rate of on-road light-duty and heavy-duty vehicles, as well as off-road equipment and engines, would be increased, requiring that older models are sold outside of California, scrapped, or recycled. Compliance responses could also include construction and operation of new manufacturing facilities to support near-zero and ~~near-zero~~ zero-emission technologies and increased manufacturing of low-NOx engines. Finally, increased Low-Emission Diesel demand stimulated by implementation of a Low-Emission Diesel standard is anticipated to increase cultivation or imports of Low-Emission Diesel fuels or feedstocks. Increased Low-Emission Diesel demand may increase processing of Low-Emission Diesel fuels, and shipment of finished

Low-Emission Diesel fuels and/or their feedstocks. Infrastructure to support collection, processing, and distribution of Low-Emission Diesel fuels, including biomethane, and associated feedstocks may also increase.

These construction activities may require the transport, use, and disposal of hazardous materials. Construction activities generally use heavy-duty equipment requiring periodic refueling and lubricating fluids. Large pieces of construction equipment (e.g., backhoes, graders) are typically fueled and maintained at the construction site as they are not designed for use on public roadways. Thus, such maintenance uses a service vehicle that mobilizes to the location of the construction equipment. It is during the transfer of fuel that the potential for an accidental release is most likely. Although precautions would be taken to ensure that any spilled fuel is properly contained and disposed, and such spills are typically minor and localized to the immediate area of the fueling (or maintenance), the potential still remains for a substantial release of hazardous materials into the environment. Consequently, the construction activities could 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.

The short-term construction-related impact associated with the State SIP Strategy on hazards and hazardous materials would be potentially significant.

The impacts could be reduced to a less-than-significant level by mitigation that can and should be implemented by federal, State, and local lead agencies, but is beyond the authority of ARB and not within its purview.

Mitigation Measure 9-1

The Regulatory Setting in Attachment 1 includes applicable laws and regulations that apply to accident-related hazards and risk of upset. ARB does not have the authority to require implementation of mitigation related to new or modified facilities that would be approved by local jurisdictions. The ability to require such measures is under the purview of jurisdictions with local or State land use approval and/or permitting authority. New or modified facilities in California would qualify as a “project” under CEQA. The jurisdiction with primary approval authority over a proposed action is the Lead Agency, which is required to review the proposed action for compliance with CEQA statutes. Project-specific impacts and mitigation would be identified during the environmental review by agencies with project-approval authority. Recognized practices that are routinely required to avoid upset and accident-related impacts include:

- Proponents of new or modified facilities or infrastructure constructed as a result of reasonably foreseeable compliance responses would coordinate with State or local land use agencies to seek entitlements for development including the completion of all necessary environmental review requirements (e.g., CEQA). The local or State land use agency or

governing body must follow all applicable environmental regulations as part of approval of a project for development.

- Based on the results of the environmental review, proponents would implement all feasible mitigation to reduce or substantially lessen the potentially significant scenic or aesthetic impacts of the project.

- Handling of potentially hazardous materials/wastes should be performed under the direction of a licensed professional with the necessary experience and knowledge to oversee the proper identification, characterization, handling and disposal or recycling of the materials generated as a result of the project. As wastes are generated, they would be placed, at the direction of the licensed professional, in designated areas that offer secure, secondary containment and/or protection from stormwater runoff. Other forms of containment may include placing waste on plastic sheeting (and/or covering with same) or in steel bins or other suitable containers pending profiling and disposal or recycling.

- The temporary storage and handling of potentially hazardous materials/wastes should be in areas away from sensitive receptors such as schools or residential areas. These areas should be secured with chain-link fencing or similar barrier with controlled access to restrict casual contact from non-project personnel. All project personnel that may come into contact with potentially hazardous materials/wastes will have the appropriate health and safety training commensurate with the anticipated level of exposure.

Because the authority to determine project-level impacts and require project-level mitigation lies with the land use approval and/or permitting agency for individual projects, and that the programmatic analysis does not allow project-specific details of mitigation, there is inherent uncertainty in the degree of mitigation ultimately implemented to reduce the potentially significant impacts.

Consequently, while impacts could be reduced to a less-than-significant level by land use and/or permitting agency conditions of approval, this ~~Draft~~ Final EA takes the conservative approach in its post-mitigation significance conclusion and discloses, for CEQA compliance purposes, that short-term construction hazards and hazardous materials impacts associated with the State SIP Strategy would be **potentially significant and unavoidable**.

Impact 9-2: Long-Term Increased Transport, Use, and Disposal of Hazardous Materials

Harmful substances can enter the environment in a number of ways throughout the entire cycle of fuel production, manufacturing, transportation, storage, distribution, and usage. Most commonly, they come out the tailpipes of vehicles as exhaust or unburned

fuel. Fuel vapors escape directly from automobile engines and gas tanks. They can also escape into the air during refueling, or when liquid fuel evaporates from a spill. Fuels can enter lakes and reservoirs through accidental spills or from motorized boats and personal watercraft. Fuels spilled on the ground or leaking from fuel storage tanks can contaminate groundwater. Substances in airborne engine exhaust settle directly onto water, soil and vegetation, or they can be washed down onto these surfaces when it rains. Also, fuel components are released into the environment during oil drilling, refining and transportation.

Batteries used in PHEZs and ZEVs are generally lithium based. Lithium is currently sourced in two ways: from hardrock, and from the evaporation of salt brines. Lithium from rock sources is primarily produced from spodumene, a lithium/aluminum/silicate mineral. Salt brine sources include salt lakes, which are currently the main source of lithium, and geothermal brines and salt brines associated with oil deposits.

Lithium is the lightest solid metal. It can be absorbed into the body by inhalation of its aerosol and by ingestion and is corrosive to the eyes, the skin, and the respiratory tract. Lithium reacts violently with strong oxidants, acids, and many compounds (hydrocarbons, halogens, halons, concrete, sand and asbestos) causing a fire and explosion hazard. In addition, lithium reacts with water, forming highly flammable hydrogen gas and corrosive fumes of lithium hydroxide. Lithium hydroxide represents a potentially substantial environmental hazard, particularly to water organisms.

However, lithium metal batteries contain no toxic metals. The primary hazard posed by lithium batteries are their ability to overheat and ignite, and once ignited, the resulting fires can be especially difficult to extinguish. The likelihood to overheat or ignite is increased if the batteries are poorly packaged, damaged or exposed to a fire or a heat source. When packaged and handled properly, lithium batteries pose no environmental hazard (Pipeline and Hazardous Materials Safety Administration 2014).

In addition, lithium batteries may be recycled. For instance, several major power utilities are working with companies — including General Motors, Ford, Toyota and Nissan — to explore the use of the batteries for stationary storage of the power produced in off-peak periods by wind turbines and solar generation stations. Lithium-ion packs also are being tested as backup power storage systems for retail centers, restaurants and hospitals, as well as for residential solar systems (Edmunds 2014).

Also, with regards to battery fires and/or explosions, there are existing propulsion battery system safety documents that define evaluation methods and make recommendations for battery system performance. The SAE Standard defines a minimum set of acceptable safety criteria for a lithium-based rechargeable battery system to be considered for use in a vehicle propulsion application as an energy storage system connected to a high voltage power train. The purpose of the SAE Standard is to assure that a battery pack can safely be integrated into an electric or

hybrid vehicle. Specifically, it is designed to assure that a single point fault will not result in fire, explosion, battery enclosure rupture or high voltage hazard.

Implementation of the State SIP Strategy measures could result in increased installation of hydrogen fueling stations. Most new hydrogen fueling stations would be located at existing gasoline stations, adjacent to or on the same island as the gasoline dispenser. Although the gasoline and hydrogen dispensers look very similar, the nozzle and hose for the hydrogen dispenser are different. The hydrogen nozzles form an airtight connection with the hydrogen FCEV fuel tank and are not physically similar to gasoline nozzles (ARB 2015a). Thus the release of hydrogen during fueling would not be expected to occur and result in a hazardous condition.

Hydrogen FCEV manufacturers developed and extensively safety-tested carbon-fiber hydrogen tanks, which can withstand environmental and man-made damage, including crash testing and ballistics. Hydrogen tanks are designed with multiple safety enhancements to prevent leaks in both routine use and extreme circumstances. Should a leak and subsequent ignition happen, the low radiant heat of a hydrogen fire and high diffusivity of hydrogen would reduce any potential damage, especially when compared to a gasoline fire.

However, design, construction, operational, and maintenance requirements for hydrogen fuel storage and handling systems in on-road vehicles are guided by standards prepared by the Society of Automotive Engineers (SAE). These standards provide performance-based requirements for verification of design prototype and production hydrogen storage and handling systems are also defined in this document. Complementary test protocols (for use in type approval or self-certification) to qualify designs (and/or production) as meeting the specified performance requirements are described. In addition, SAE provides requirements related to crashworthiness of hydrogen storage and handling systems. These requirements define recommended practices related to the integration of hydrogen storage and handling systems, fuel cell system, and electrical systems into the overall Fuel Cell Vehicle (SAE 2013).

Thus, because lithium-ion batteries and hydrogen fuel cell systems are designed to substantially reduce the potential for hazardous conditions associated with transport, use and disposal, impacts would be **less-than-significant**.

10. Hydrology and Water Quality

Impact 10-1: Short-Term Construction-Related Hydrologic Resource Impacts

Reasonably foreseeable compliance responses associated with the State SIP Strategy include: increased infrastructure for natural gas and hydrogen refueling stations; increased demand for lithium battery manufacturing and associated increases in lithium mining and exports; increased recycling or refurbishment of lithium batteries; increased emission testing of vehicles which may cause construction of new testing centers to monitor vehicle emissions throughout the State. It is anticipated that the replacement

rate of on-road light-duty and heavy-duty vehicles, as well as off-road equipment and engines, would be increased, requiring that older models are sold outside of California, scrapped, or recycled. Compliance responses could also include construction and operation of new manufacturing facilities to support near-zero and ~~near-zero~~ zero-emission technologies and increased manufacturing of low-NOx engines. Finally, increased Low-Emission Diesel demand stimulated by implementation of a Low-Emission Diesel standard is anticipated to increase cultivation or imports of Low-Emission Diesel fuels or feedstocks. Increased Low-Emission Diesel demand may increase processing of Low-Emission Diesel fuels, and shipment of finished Low-Emission Diesel fuels and/or their feedstocks. Infrastructure to support collection, processing, and distribution of Low-Emission Diesel fuels, including biomethane, and associated feedstocks may also increase.

Construction activities could require disturbance of undeveloped areas, such as clearing of vegetation, earth movement and grading, trenching for utility lines, erection of new buildings, and paving of parking lots, delivery areas, and roadways. Specific construction projects would be required to comply with applicable erosion, water quality standards, and waste discharge requirements (e.g., NPDES, stormwater pollution prevention plan [SWPPP]). With respect to depleting groundwater supplies, impairing quality, and runoff issues, construction of new facilities would not be anticipated to result in substantial demands due to the nature of associated activities. However, depending on the location of construction activities, there could be adverse effects on drainage patterns and exposure of people or structures to areas susceptible to flood, seiche, tsunami, or mudflow.

Short-term construction-related impacts to hydrology and water quality associated with the State SIP Strategy would be potentially significant.

Impacts to hydrologic resources could be reduced to a less-than-significant level by mitigation that can and should be implemented by federal, State, and local lead agencies, but is beyond the authority of ARB and not within its purview.

Mitigation Measure 10-1

The Regulatory Setting in Attachment 1 includes applicable laws and regulations regarding hydrology and water quality ARB does not have the authority to require implementation of mitigation related to new or modified facilities that would be approved by local jurisdictions. The ability to require such measures is under the purview of jurisdictions with local or State land use approval and/or permitting authority. New or modified facilities in California would qualify as a “project” under CEQA. The jurisdiction with primary approval authority over a proposed action is the Lead Agency, which is required to review the proposed action for compliance with CEQA statutes. Project-specific impacts and mitigation would be identified during the environmental review by agencies with project-approval authority. Recognized practices that are routinely required to avoid and/or mitigate hydrology and water quality-related impacts include the following:

- Proponents of new or modified facilities or infrastructure constructed as a result of reasonably foreseeable compliance responses would coordinate with State or local land use agencies to seek entitlements for development including the completion of all necessary environmental review requirements (e.g., CEQA). The local or State land use agency or governing body must follow all applicable environmental regulations as part of approval of a project for development.

- Based on the results of the environmental review, proponents would implement all feasible mitigation to reduce or substantially lessen the potentially significant scenic or aesthetic impacts of the project. Actions required to mitigate potentially significant hydrology and water quality impacts may include the following; however, any mitigation specifically required for a new or modified facility would be determined by the local lead agency.

  - Under the oversight of the local lead agency, prior to issuance of any construction permits, the proponents for the proposed renewable energy project would prepare a stormwater drainage and flood control analysis and management plan. The plans would be prepared by a qualified professional and would summarize existing conditions and the effects of project improvements, and would include all appropriate calculations, a watershed map, changes in downstream flows and flood elevations, proposed on- and off-site improvements, features to protect downstream uses, and property and drainage easements to accommodate downstream flows from the site. Project drainage features would be designed to protect existing downstream flow conditions that would result in new or increased severity of offsite flooding.

  - Establish drainage performance criteria for off-site drainage, in consultation with county engineering staff, such that project-related drainage is consistent with applicable facility designs, discharge rates, erosion protection, and routing to drainage channels, which could be accomplished by, but is not limited to: (a) minimizing directly connected impervious areas; (b) maximizing permeability of the site; and, (c) stormwater quality controls such as infiltration, detention/retention, and/or biofilters; and basins, swales, and pipes in the system design.

  - The project proponent would design and construct new facilities to provide appropriate flood protection such that operations are not adversely affected by flooding and inundation. These designs would be approved by the local or State land use agency. The project proponent would also consult with the appropriate flood control authority on the design of offsite stream crossings such that the minimum elevations are above the predicted surface-water elevation at the agency's

designated design peak flows. Drainage and flood prevention features shall be inspected and maintained on a routine schedule specified in the facility plans, and as specified by the county authority.

- As part of subsequent project-level planning and environmental review, the project proponent shall coordinate with the local groundwater management authority and prepare a detailed hydrogeological analysis of the potential project-related effects on groundwater resources prior to issuance of any permits. The proponent shall mitigate for identified adverse changes to groundwater by incorporating technically achievable and feasible modifications into the project to avoid offsite groundwater level reductions, use alternative technologies or changes to water supply operations, or otherwise compensate or offset the groundwater reductions.

Because the authority to determine project-level impacts and require project-level mitigation lies with the land use approval and/or permitting agency for individual projects, and that the programmatic analysis does not allow project-specific details of mitigation, there is inherent uncertainty in the degree of mitigation ultimately implemented to reduce the potentially significant impacts.

Consequently, while impacts could be reduced to a less-than-significant level by land use and/or permitting agency conditions of approval, this ~~Draft~~ Final EA takes the conservative approach in its post-mitigation significance conclusion and discloses, for CEQA compliance purposes, that short-term construction-related impacts to hydrology and water quality associated with the State SIP Strategy would be **potentially significant and unavoidable**.

Impact 10-2: Long-Term Effects on Hydrology and Water Quality

Reasonably foreseeable compliance responses associated with the State SIP Strategy include operation of new manufacturing facilities to support increased market penetration of PHEV, non-combustion ZEV including BEVs and hydrogen FCEV zero-emission technologies, and electric-powered equipment (e.g., forklifts). Increased use of near-zero and zero-emission technologies may result in increased infrastructure for natural gas and hydrogen refueling and charging stations, and increased demand for lithium battery manufacturing and associated increases in lithium mining and exports. New testing centers to monitor vehicle emissions may be constructed throughout the State. In addition, increased Low-Emission Diesel demand stimulated by implementation of a Low-Emission Diesel standard is anticipated to increase cultivation or imports of Low-Emission Diesel fuels or feedstocks. Increased Low-Emission Diesel demand may increase processing of Low-Emission Diesel fuels, and shipment of finished Low-Emission Diesel fuels and/or their feedstocks. Infrastructure to support collection, processing, and distribution of Low-Emission Diesel fuels, including biomethane, and associated feedstocks may also increase.

Implementation of the State SIP Strategy would result in increased demand for lithium batteries which would accelerate the market for mined lithium. It is reasonable to assume that compliance responses associated with the State SIP Strategy would lead to an increase in mining-related activities of hard rock and continental brines for the procurement of lithium ore. Mining of hard rock would require the use of conventional mining practices including the creation of underground mines and open pits, which would result in the removal of organic material (e.g., bedrock, vegetation). Additionally, lithium can be collected from continental brines found in basins. Salty groundwater is pumped into lagoons where it undergoes evaporation producing salts containing lithium compounds.

Discharge of water from mining operations is regulated by state and federal statutes, such as the Clean Water Act and Safe Drinking Water Act. Mining operations are required to obtain several permits, which set guidelines for controlling water pollution through establishment of discharge standards. These permits include NPDES permits (which regulate point sources for pollution) and SWPPP in case of overflow. These permits set limits on the amounts of particular substances that can be discharged in water to protect public and environmental health.

Implementation of Low-Emission Diesel requirements could result in increased demand for Low-Emission Diesel feedstocks, such as oilseed crops or tallow, which are used to produce renewable diesel. Water pollutants that result from farming practices includes: sediment, nutrients, pathogens, pesticides, metals, and salts. Impacts from agricultural activities on surface water and ground water can be minimized by using management practices that are adapted to local conditions. In general, farmers may employ best management practices (BMPs) to reduce runoff associated with agricultural practices. BMPs vary among different locations because “best” can be a highly subjective and site-specific label. For example, a practice may be considered best in one area (e.g., coastal plain) but inappropriate in another area (e.g., mountains). Criteria for determining what is best may include extent of pollution prevention or pollutant removal, ease of implementation, ease of maintenance and operation, durability, attractiveness to landowner, cost, and cost-effectiveness. In addition, Low-Emission Diesel fuels would be subject to the LCFS, which would require an analysis of the indirect effects of producing that fuel, including the pesticide and nutrient use. This analysis would be used to determine the fuel’s CI value. Because the LCFS regulation incentivizes reduced CI values, and the use of pesticides results in increased CI values, the LCFS discourages increased chemical use for cultivation of biomass-based fuels. Nonetheless, implementation of the State SIP Strategy could result in adverse effects on water quality.

Long-term operational impacts on hydrology and water quality would be potentially significant.

These impacts could be reduced to a less-than-significant level by mitigation that can and should be implemented by local lead agencies, but is beyond the authority of ARB and not within its purview.

Mitigation Measure 10-2

The Regulatory Setting in Attachment 1 includes applicable laws and regulations that provide protection of hydrology and water quality. ARB does not have the authority to require implementation of mitigation related to new or modified facilities that would be approved by local jurisdictions. The ability to require such measures is under the purview of jurisdictions with local or State land use approval and/or permitting authority. New or modified facilities in California would qualify as a "project" under CEQA. The jurisdiction with primary approval authority over a proposed action is the Lead Agency, which is required to review the proposed action for compliance with CEQA statutes. Project-specific impacts and mitigation would be identified during the environmental review by agencies with project-approval authority. Recognized practices that are routinely required to avoid and/or minimize impacts to hydrology and water quality:

- Use no-till agriculture to reduce soil erosion.
- Avoid harvesting in areas with steep slopes.
- Identify and avoid areas with unstable slopes and local factors that can cause slope instability (groundwater conditions, precipitation, seismic activity, slope angles, and geologic structure).
- Identify soil properties, engineering constraints, and facility design criteria.
- Develop a site grading and management plan to identify areas of disturbance, areas of cut and fill, slope during and after grading, existing vegetation, and measures to protect slope, drainages, and existing vegetation in the project area.
- Develop an erosion control plan to delineate measures to minimize soil loss and reduce sedimentation to protect water quality.
- Design runoff control features to minimize soil erosion.
- Construct drainage ditches only where necessary.
- Use appropriate structures at culvert outlets to prevent erosion.

Consequently, while impacts could be reduced to a less-than-significant level by land use and/or permitting agency conditions of approval, this ~~Draft~~ Final EA takes the conservative approach in its post-mitigation significance conclusion and discloses, for CEQA compliance purposes, that long-term operational impacts to hydrology and water

quality associated with the State SIP Strategy would be **potentially significant and unavoidable**.

11. Land Use and Planning

Impact 11-1: Short-Term Construction-Related and Long-Term Operational Impacts on Land Use and Planning

Reasonably foreseeable compliance responses associated with the State SIP Strategy include: increased infrastructure for natural gas and hydrogen refueling stations; increased demand for lithium battery manufacturing and associated increases in lithium mining and exports; increased recycling or refurbishment of lithium batteries; increased emission testing of vehicles which may cause construction of new testing centers to monitor vehicle emissions throughout the State. It is anticipated that the replacement rate of on-road light-duty and heavy-duty vehicles, as well as off-road equipment and engines, would be increased, requiring that older models are sold outside of California, scrapped, or recycled. Compliance responses could also include construction and operation of new manufacturing facilities to support near-zero and ~~near-zero~~ zero-emission technologies and increased manufacturing of low-NOx engines. Finally, increased Low-Emission Diesel demand stimulated by implementation of a Low-Emission Diesel standard is anticipated to increase cultivation or imports of Low-Emission Diesel fuels or feedstocks. Increased Low-Emission Diesel demand may increase processing of Low-Emission Diesel fuels, and shipment of finished Low-Emission Diesel fuels and/or their feedstocks. Infrastructure to support collection, processing, and distribution of Low-Emission Diesel fuels, including biomethane, and associated feedstocks may also increase.

Implementation of a specification for Low-Emission Diesel fuels could increase demand for feedstock production (e.g., oilseed crops). As described above, under Impact 2-1, Low-Emission Diesel fuels would be subject to the LCFS, which would require an analysis of the indirect effects of producing that fuel, including indirect land use change. This analysis would be used to determine the fuel's CI value. Because the LCFS regulation incentivizes reduced CI values, and indirect land use change results in increased CI values, the LCFS likely discourages the extent to which land use conversion could occur to meet feedstock demands. However, short-term agricultural land use changes could result in removal of existing vegetation, immediate loss of natural habitat and subsequent reduction in biodiversity (Bertzky et al 2011), displacement of agricultural land used for food production, and immediate changes to the physiological and hydrological configuration of the existing land due to grading.

With respect to effects related to land use and planning, the long-term conversion of lands required to implement the reasonably foreseeable compliance responses associated with the State SIP Strategy could be located in areas subject to local conservation plans or zoning policies. This could then result in an intensification of adverse effects associated with the conversion or modification of natural land or existing agriculture such as impacts on sensitive species populations; soil carbon content;

annual carbon sequestration losses, depending on the land use; long-term erosion effects; adverse effects on local or regional water resources; and long-term water quality deterioration associated with intensified fertilizer use, pesticide or herbicide run-off. However, planning efforts associated with the implementation of compliance responses associated with the State SIP Strategy would be made in coordination with local, State, or federal jurisdictions. Thus, reasonably foreseeable compliance responses would not be anticipated to divide an established community or conflict with a land use or conservation plan.

Short-term construction-related and long-term operational land use impacts would be **less-than-significant**.

The environmental consequences of land use changes are considered in their respective sections of the ~~Draft~~ Final EA. Potential indirect environmental impacts associated with land use change on agriculture and forestry, biology, geology and soils, and hydrology and their related mitigation measures are discussed in further detail under Impacts 2-1, 2-2, 4-1, 4-2, 8-2, and 10-1.

12. Mineral Resources

Impact 12-1: Short-Term Construction-Related Impacts on the Mineral Resources

Reasonably foreseeable compliance responses associated with the State SIP Strategy include: increased infrastructure for natural gas and hydrogen refueling stations; increased demand for lithium battery manufacturing and associated increases in lithium mining and exports; increased recycling or refurbishment of lithium batteries; increased emission testing of vehicles which may cause construction of new testing centers to monitor vehicle emissions throughout the State. It is anticipated that the replacement rate of on-road light-duty and heavy-duty vehicles, as well as off-road equipment and engines, would be increased, requiring that older models are sold outside of California, scrapped, or recycled. Compliance responses could also include construction and operation of new manufacturing facilities to support near-zero and ~~near-zero~~ zero-emission technologies and increased manufacturing of low-NOx engines. Finally, increased Low-Emission Diesel demand stimulated by implementation of a Low-Emission Diesel standard is anticipated to increase cultivation or imports of Low-Emission Diesel fuels or feedstocks. Increased Low-Emission Diesel demand may increase processing of Low-Emission Diesel fuels, and shipment of finished Low-Emission Diesel fuels and/or their feedstocks. Infrastructure to support collection, processing, and distribution of Low-Emission Diesel fuels, including biomethane, and associated feedstocks may also increase.

Implementation of the State SIP Strategy could result in the construction of new manufacturing plants that specialize in the production of propulsion batteries and fuel cells. New hydrogen fueling stations would also be constructed along with modifications to existing hydrogen production plants. These would likely occur within existing

footprints or in areas with consistent zoning where original permitting and analyses considered these issues.

The short-term construction-related impact associated with the State SIP Strategy on mineral resources would be **less-than-significant**.

Impact 12-2: Long-Term Operational Impacts on Mineral Resources

Reasonably foreseeable compliance responses associated with the State SIP Strategy include operation of new manufacturing facilities to support increased market penetration of PHEVs, ZEVs, and other electric-powered equipment. Currently PHEVs, ZEVs, hydrogen FCEVs, and electric-powered equipment use lithium-based batteries. As a result, an increase in these types of products would require increased battery production and increased lithium mining. For the purposes of this document it would be too speculative to determine if, when, and where a new lithium mine may be located. In the case that new lithium mines are required, they would go through independent environmental review at the appropriate federal, state, or local level (see Attachment 1 for more information). It is assumed, for the purposes of this analysis that any new mines would be located in areas with appropriate zoning, and subject to Federal, State, and/or local requirements.

Batteries associated with near-zero and ~~near-zero~~ zero-emission vehicles are primarily lithium-based. Generally, other types of HEV, PHEV, and EV battery options, such as nickel-metal hydride are not as favorable due to challenges related to high cost, high self-discharge, and heat generation at high temperatures (U.S. Department of Energy [DOE] 2016). Thus, it is assumed that mineral resource requirements associated with implementation of the State SIP Strategy would be related to lithium resources.

As of January 2015, the only lithium mine operating in the U.S. was a brine operation in Nevada. Two companies produced a large array of downstream lithium compounds in the U.S. from domestic or South American lithium carbonate, lithium chloride, and lithium hydroxide. Lithium consumption for batteries has increased substantially in recent years due to increased demand for rechargeable lithium batteries. Currently the U.S. imports the majority of lithium from Chile (50 percent), Argentina (46 percent); and China (3 percent). Worldwide mine production and reserves are provided in Table 4-1 (U.S. Geological Survey [USGS] 2015).

Table 4-1
Mine production and Reserves

Country	2013 (metric tons)	2014 (metric tons)	Reserves (metric tons)
U.S.	870	N/A	38,000
Argentina	2,500	2,900	850,000
Australia	12,700	13,000	1,500,000
Brazil	400	400	48,000
Chile	11,200	12,900	7,500,000

Table 4-1
Mine production and Reserves

Country	2013 (metric tons)	2014 (metric tons)	Reserves (metric tons)
China	4,700	5,000	3,500,000
Portugal	570	570	60,000
Zimbabwe	1,000	1,000	23,000
World total (rounded)	34,000	36,000	13,500,000
Note: Reserves data are dynamic. They may be considered a working inventory of mining companies' supply of an economically extractable mineral commodity. Inventory is limited by many considerations, including cost of drilling, taxes, price of the mineral commodity being mined, and the demand for it. Source: USGS 2015			

The magnitude of reserves, shown above, is necessarily limited by many considerations, including cost of drilling, taxes, price of the mineral commodity being mined and the associated demand. In addition to the reserves described above, deposits of mineral resources are also important to consider in assessing future supplies. For instance, lithium resources in the U.S. are estimated to total 5.5 million metric tons. In addition, approximately 34 million tons of lithium are estimated to be present in other countries, including 7.5 million metric tons in Bolivia, 9 million metric tons in Chile, 6.5 million metric tons in Argentina, 1.7 million metric tons in Australia, and 6.5 million metric tons in China. In addition, Canada, Congo (Kinshasa), Russia, and Serbia have resources of approximately 1 million metric tons each. (USGS 2015).

Worldwide demand of global lithium is estimated to be below 20 million metric tons for the period of 2010 through 2100 (Gruber et. al., 2011). This is well-below the estimated worldwide reserves and resources currently known to exist worldwide. In addition, lithium battery recycling potential could supplement future increased demands (NREL 2011).

Appendix G of the CEQA Guidelines considers an impact on mineral resources to be the result in the loss of availability of a known mineral resource that would be of value to a local entity, a region, or the state. This type of impact could result from actions such as building a structure over an area that contains mineral resources, thereby prohibiting access to mining activities. While implementation of the State SIP Strategy could result in an increased demand in lithium, it would not substantially affect the availability of a mineral resource.

Thus, implementation of the State SIP Strategy would have a **less-than-significant** long-term operational impact on mineral resources.

13. Noise

Impact 13-1: Short-Term Construction-Related Noise Impacts

Reasonably foreseeable compliance responses associated with the State SIP Strategy include: increased infrastructure for natural gas and hydrogen refueling stations; increased demand for lithium battery manufacturing and associated increases in lithium mining and exports; increased recycling or refurbishment of lithium batteries; increased emission testing of vehicles which may cause construction of new testing centers to monitor vehicle emissions throughout the State. It is anticipated that the replacement rate of on-road light-duty and heavy-duty vehicles, as well as off-road equipment and engines, would be increased, requiring that older models are sold outside of California, scrapped, or recycled. Compliance responses could also include construction and operation of new manufacturing facilities to support near-zero and ~~near-zero~~ zero-emission technologies and increased manufacturing of low-NOx engines. Finally, increased Low-Emission Diesel demand stimulated by implementation of a Low-Emission Diesel standard is anticipated to increase cultivation or imports of Low-Emission Diesel fuels or feedstocks. In addition, increased Low-Emission Diesel demand may increase processing of Low-Emission Diesel fuels, and shipment of finished Low-Emission Diesel fuels and/or their feedstocks. Infrastructure to support collection, processing, and distribution of Low-Emission Diesel fuels, including biomethane, and associated feedstocks may also increase.

Construction noise levels that could result from the implementation of new manufacturing facilities, near-zero and ~~near-zero~~ zero-emission-related infrastructure, and feedstock processing facilities would fluctuate depending on the particular type, number, size, and duration of usage for the varying equipment. The effects of construction noise largely depend on the type of construction activities occurring on any given day, noise levels generated by those activities, distances to noise sensitive receptors, and the existing ambient noise environment in the receptor's vicinity. Construction generally occurs in several discrete stages, each phase requiring a specific complement of equipment with varying equipment type, quantity, and intensity. These variations in the operational characteristics of the equipment change the effect they have on the noise environment of the project site and in the surrounding community for the duration of the construction process.

To assess noise levels associated with the various equipment types and operations, construction equipment can be considered to operate in two modes, mobile and stationary. Mobile equipment sources move around a construction site performing tasks in a recurring manner (e.g., loaders, graders, dozers). Stationary equipment operates in a given location for an extended period of time to perform continuous or periodic operations. Operational characteristics of heavy construction equipment are additionally typified by short periods of full-power operation followed by extended periods of operation at lower power, idling, or powered-off conditions.

Additionally, when construction-related noise levels are being evaluated, activities that occur during the more noise-sensitive evening and nighttime hours are of increased concern. Because exterior ambient noise levels typically decrease during the late evening and nighttime hours as traffic volumes and commercial activities decrease, construction activities performed during these more noise-sensitive periods of the day can result in increased annoyance and potential sleep disruption for occupants of nearby residential uses.

The site preparation phase typically generates the most substantial noise levels because of the on-site equipment associated with grading, compacting, and excavation, which uses the noisiest types of construction equipment. Site preparation equipment and activities include backhoes, bulldozers, loaders, and excavation equipment (e.g., graders and scrapers). Construction of large structural elements and mechanical systems could require the use of a crane for placement and assembly tasks, which may also generate noise levels. Although a detailed construction equipment list is not currently available, based on this project type it is expected that the primary sources of noise would include backhoes, bulldozers, and excavators. Noise emission levels from typical types of construction equipment can range from approximately 74 to 94 A-weighted decibels (dBA) at 50 feet.

Based on this information and accounting for typical usage factors of individual pieces of equipment and activity types, on-site construction could result in hourly average noise levels of 87 dBA equivalent level measurements (Leq) at 50 feet and maximum noise levels of 90 dBA maximum sound level (Lmax) at 50 feet from the simultaneous operation of heavy-duty equipment and blasting activities, if deemed necessary. Based on these and general attenuation rates, exterior noise levels at noise-sensitive receptors located within thousands of feet from project sites could exceed typical standards (e.g., 50/60 dBA Leq/Lmax during the daytime hours and 40/50 dBA Leq/Lmax during the nighttime hours).

Additionally, construction activities may result in varying degrees of temporary groundborne noise and vibration, depending on the specific construction equipment used and activities involved. Groundborne noise and vibration levels caused by various types of construction equipment and activities (e.g., bulldozers, blasting) range from 58 – 109 vibration decibels (VdB) and from 0.003 – 0.089 inch per second (in/sec) peak particle velocity (PPV) at 25 feet. Similar to the above discussion, although a detailed construction equipment list is not currently available, based on this project type it is expected that the primary sources of groundborne vibration and noise would include bulldozers and trucks. According to the Federal Transit Administration (FTA), levels associated with the use of a large bulldozer and trucks are 0.089 and 0.076 in/sec PPV (87 and 86 VdB) at 25 feet, respectively. With respect to the prevention of structural damage, construction-related activities would not exceed recommended levels (e.g., 0.2 in/sec PPV). However, based on FTA's recommended procedure for applying a propagation adjustment to these reference levels, bulldozing and truck activities could

exceed recommended levels with respect to the prevention of human disturbance (e.g., 80 VdB) within 275 feet.

Thus, implementation of reasonably foreseeable compliance responses could result in the generation of short-term construction noise in excess of applicable standards or that result in a substantial increase in ambient levels at nearby sensitive receptors, and exposure to excessive vibration levels.

Short-term construction-related impacts on noise associated with implementation of the State SIP Strategy would be potentially significant.

These impacts could be reduced to a less-than-significant level by mitigation that can and should be implemented by local lead agencies, but is beyond the authority of ARB and not within its purview.

Mitigation Measure 13-1

The Regulatory Setting in Attachment 1 includes, but is not limited to, applicable laws and regulations that pertain to noise. ARB does not have the authority to require implementation of mitigation related to new or modified facilities that could be approved by local jurisdictions. The ability to require such measures is under the purview of jurisdictions with local or State land use approval and/or permitting authority. New or modified facilities in California would qualify as a "project" under CEQA. The jurisdiction with primary approval authority over a proposed action is the Lead Agency, which is required to review the proposed action for compliance with CEQA statutes. Project-specific impacts and mitigation would be identified during the environmental review by agencies with project-approval authority. Recognized practices that are routinely required to avoid and/or minimize noise include:

- Proponents of new or modified facilities or infrastructure constructed as a result of reasonably foreseeable compliance responses would coordinate with State or local land use agencies to seek entitlements for development including the completion of all necessary environmental review requirements (e.g., CEQA). The local or State land use agency or governing body must follow all applicable environmental regulations as part of approval of a project for development.

- Based on the results of the environmental review, proponents would implement all feasible mitigation to reduce or substantially lessen the potentially significant scenic or aesthetic impacts of the project. Actions required to mitigate potentially significant noise impacts may include the following; however, any mitigation specifically required for a new or modified facility would be determined by the local lead agency.

- Ensure noise-generating construction activities (including truck deliveries, pile driving, and blasting) are limited to the least noise-sensitive times of

day (e.g., weekdays during the daytime hours) for projects near sensitive receptors.

- Consider use of noise barriers, such as berms, to limit ambient noise at property lines, especially where sensitive receptors may be present.
- Ensure all project equipment has sound-control devices no less effective than those provided on the original equipment.
- All construction equipment used would be adequately muffled and maintained.
- Consider use of battery-powered forklifts and other facility vehicles.
- Ensure all stationary construction equipment (i.e., compressors and generators) is located as far as practicable from nearby sensitive receptors or shielded.
- Properly maintain mufflers, brakes and all loose items on construction and operation related vehicles to minimize noise and address operational safety issues. Keep truck operations to the quietest operating speeds. Advise about downshifting and vehicle operations in sensitive communities to keep truck noise to a minimum.
- Use noise controls on standard construction equipment; shield impact tools.
- Consider use of flashing lights instead of audible back-up alarms on mobile equipment.
- Install mufflers on air coolers and exhaust stacks of all diesel and gas-driven engines.
- Equip all emergency pressure relief valves and steam blow-down lines with silencers to limit noise levels.
- Contain facilities within buildings or other types of effective noise enclosures.
- Employ engineering controls, including sound-insulated equipment and control rooms, to reduce the average noise level in normal work areas.

Because the authority to determine project-level impacts and require project-level mitigation lies with land use and/or permitting agencies for individual projects, and that the programmatic analysis does not allow project-specific details of mitigation, there is

inherent uncertainty in the degree of mitigation ultimately implemented to reduce the potentially significant impacts.

Consequently, while impacts could be reduced to a less-than-significant level by land use and/or permitting agency conditions of approval, this ~~Draft~~ Final EA takes the conservative approach in its post-mitigation significance conclusion and discloses, for CEQA compliance purposes, that short-term construction-related noise impacts associated with the State SIP Strategy could be **potentially significant and unavoidable**.

Impact 13-2: Long-Term Operational-Related Noise Impacts

Reasonably foreseeable compliance responses associated with the State SIP Strategy include operation of new manufacturing facilities to support increased market penetration of PHEV, non-combustion ZEV including BEVs and hydrogen FCEV zero-emission technologies, and electric-powered equipment (e.g., forklifts). Increased use of near-zero and zero-emission technologies may result in increased infrastructure for natural gas and hydrogen refueling and charging stations, and increased demand for lithium battery manufacturing and associated increases in lithium mining and exports. New testing centers to monitor vehicle emissions may be operated throughout the State. In addition, increased Low-Emission Diesel demand stimulated by implementation of a Low-Emission Diesel standard is anticipated to increase cultivation or imports of Low-Emission Diesel fuels or feedstocks. Increased Low-Emission Diesel demand may increase processing of Low-Emission Diesel fuels, and shipment of finished Low-Emission Diesel fuels and/or their feedstocks. Infrastructure to support collection, processing, and distribution of Low-Emission Diesel fuels, including biomethane, and associated feedstocks may also increase.

New sources of noise associated with implementation of the State SIP Strategy could include operation of feedstock processing facilities and manufacturing plants. Feedstock processing facilities could include on-site noise sources, including fuel-delivery and other hauling-related activities (e.g., truck unloading), fuel-handling and processing activities (e.g., conveyor system, wheeled loader, dozer), and mechanical equipment (e.g., boiler, turbine, fans, pumps). Depending on the proximity to existing noise-sensitive receptors, stationary source noise levels could exceed applicable noise standards and result in a substantial increase in ambient noise levels.

Further, operational-related activities associated with lithium mining could produce substantial stationary sources of noise. Mechanical equipment (e.g., dozers) required to excavate bedrock and vegetation would generate noise that could be considered adverse to sensitive receptors; however, it would be expected that expansion of existing mines would not involve sensitive receptors given that mines typically are located in areas zoned for such uses. While it would be anticipated that new lithium mines constructed as a compliance response to the State SIP Strategy would be located in areas of consistent zoning and therefore not in close proximity to sensitive receptors, the exact locations are not known at this time.

Long-term operational noise impacts associated with the State SIP Strategy could be potentially significant.

These impacts on noise could be reduced to a less-than-significant level by mitigation that can and should be implemented by local lead agencies, but is beyond the authority of ARB.

Mitigation Measure 13-2: Implement Mitigation Measure 13-1

Because the authority to determine project-level impacts and require project-level mitigation lies with land use and/or permitting agencies for individual projects, and that the programmatic analysis does not allow project-specific details of mitigation, there is inherent uncertainty in the degree of mitigation ultimately implemented to reduce the potentially significant impacts.

Consequently, while impacts could be reduced to a less-than-significant level by land use and/or permitting agency conditions of approval, this ~~Draft~~ Final EA takes the conservative approach in its post-mitigation significance conclusion and discloses, for CEQA compliance purposes, that long-term operational noise impacts associated with the State SIP Strategy could be **potentially significant and unavoidable**.

14. Population and Housing

Impact 14-1: Short-Term Construction-Related and Long-Term Operational-Related Effects to Population and Housing

Reasonably foreseeable compliance responses associated with the State SIP Strategy include: increased infrastructure for natural gas and hydrogen refueling stations; increased demand for lithium battery manufacturing and associated increases in lithium mining and exports; increased recycling or refurbishment of lithium batteries; increased emission testing of vehicles which may cause construction of new testing centers to monitor vehicle emissions throughout the State. It is anticipated that the replacement rate of on-road light-duty and heavy-duty vehicles, as well as off-road equipment and engines, would be increased, requiring that older models are sold outside of California, scrapped, or recycled. Compliance responses could also include construction and operation of new manufacturing facilities to support near-zero and ~~near-zero~~ zero-emission technologies and increased manufacturing of low-NOx engines. Finally, increased Low-Emission Diesel demand stimulated by implementation of a Low-Emission Diesel standard is anticipated to increase cultivation or imports of Low-Emission Diesel fuels or feedstocks. Increased Low-Emission Diesel demand may increase processing of Low-Emission Diesel fuels, and shipment of finished Low-Emission Diesel fuels and/or their feedstocks. Infrastructure to support collection, processing, and distribution of Low-Emission Diesel fuels, including biomethane, and associated feedstocks may also increase.

Although it is reasonably foreseeable that activities associated with new feedstock processing facilities, testing centers, and manufacturing plants could occur, there is uncertainty as to the exact location or character of any new facilities. Construction activities would be anticipated to require relatively small crews, and demand for these crews would be temporary (e.g., 6 – 12 months per project). Therefore, it would be anticipated that the need for a substantial amount of construction worker migration would not occur and that a sufficient construction employment base would likely be available.

Operation of feedstock processing facilities, testing centers, near-zero and ~~near-zero~~ zero-emission technology manufacturing plants, and lithium mines would generate varying levels of employment opportunity. The numbers of jobs produced would be directly related to the size, capacity, and, in some cases, commodity manufactured. This range could be between twenty (e.g., small feedstock processing facility) to several thousand (e.g., Tesla gigafactory); however, it would be expected that locations of these facilities would be selected such that an appropriate employment base existed to support operation or where local jurisdictions have planned for increased population and employment growth.

Thus, operational activities would not require new additional housing to accommodate or generate changes in land use and, therefore, would not affect the provisions of population and housing.

As a result, short-term construction-related and long-term operational impacts, associated with implementation of the State SIP Strategy on population and housing would be **less-than-significant**.

15. Public Services

Impact 15-1: Short-Term Construction-Related and Long-Term Operational-Related Effects to Public Services

Reasonably foreseeable compliance responses associated with the State SIP Strategy include: increased infrastructure for natural gas and hydrogen refueling stations; increased demand for lithium battery manufacturing and associated increases in lithium mining and exports; increased recycling or refurbishment of lithium batteries; increased emission testing of vehicles which may cause construction of new testing centers to monitor vehicle emissions throughout the State. It is anticipated that the replacement rate of on-road light-duty and heavy-duty vehicles, as well as off-road equipment and engines, would be increased, requiring that older models are sold outside of California, scrapped, or recycled. Compliance responses could also include construction and operation of new manufacturing facilities to support near-zero and ~~near-zero~~ zero-emission technologies and increased manufacturing of low-NOx engines. Finally, increased Low-Emission Diesel demand stimulated by implementation of a Low-Emission Diesel standard is anticipated to increase cultivation or imports of Low-Emission Diesel fuels or feedstocks. Increased Low-Emission Diesel demand may

increase processing of Low-Emission Diesel fuels, and shipment of finished Low-Emission Diesel fuels and/or their feedstocks. Infrastructure to support collection, processing, and distribution of Low-Emission Diesel fuels, including biomethane, and associated feedstocks may also increase.

Although it is reasonably foreseeable that activities associated with new feedstock processing facilities, testing centers, and manufacturing plants could occur, there is uncertainty as to the exact location or character of any new facilities. However, these would likely occur in areas with zoning that would permit the development of manufacturing or industrial uses. Construction activities would be anticipated to require relatively small crews, and demand for these crews would be temporary (e.g., 6 – 12 months per project). Therefore, it would be anticipated that the need for a substantial amount of construction worker migration would not occur and that a sufficient construction employment base would likely be available.

As discussed in Impact 14-1, "Short-Term Construction-Related and Long-Term Operational Effects on Population and Housing," operation of plants, mines, and facilities would provide a range of employment opportunity depending on size and capacity. While implementation of the State SIP Strategy would produce long-term employment, it would be anticipated that a sufficient employment base would be available. Thus, operational activities would not require a substantial amount of new additional housing to accommodate new populations or generate changes in land use and, therefore, would not be expected to increase population levels such that the provisions of public services would be substantially affected.

As a result, short-term construction-related and long-term operational impacts, associated with the State SIP Strategy on public services would be **less-than-significant**.

16. Recreation

Impact 16-1: Short-Term Construction-Related and Long-Term Operational-Related Effects to Recreation

Reasonably foreseeable compliance responses associated with the State SIP Strategy include: increased infrastructure for natural gas and hydrogen refueling stations; increased demand for lithium battery manufacturing and associated increases in lithium mining and exports; increased recycling or refurbishment of lithium batteries; increased emission testing of vehicles which may cause construction of new testing centers to monitor vehicle emissions throughout the State. It is anticipated that the replacement rate of on-road light-duty and heavy-duty vehicles, as well as off-road equipment and engines, would be increased, requiring that older models are sold outside of California, scrapped, or recycled. Compliance responses could also include construction and operation of new manufacturing facilities to support near-zero and ~~near-zero~~ zero-emission technologies and increased manufacturing of low-NOx engines. Finally, increased Low-Emission Diesel demand stimulated by implementation of a

Low-Emission Diesel standard is anticipated to increase cultivation or imports of Low-Emission Diesel fuels or feedstocks. Increased Low-Emission Diesel demand may increase processing of Low-Emission Diesel fuels, and shipment of finished Low-Emission Diesel fuels and/or their feedstocks. Infrastructure to support collection, processing, and distribution of Low-Emission Diesel fuels, including biomethane, and associated feedstocks may also increase.

Although it is reasonably foreseeable that activities associated with new feedstock processing facilities, testing centers, and manufacturing plants could occur, there is uncertainty as to the exact location or character of any new facilities. However, these would likely occur in areas with zoning that would permit the development of manufacturing or industrial uses. Construction activities would be anticipated to require relatively small crews, and demand for these crews would be temporary (e.g., 6 – 12 months per project). Therefore, it would be anticipated that the need for a substantial amount of construction worker migration would not occur and that a sufficient construction employment base would likely be available.

As discussed in Impact 14-1, “Short-Term Construction-Related and Long-Term Operational Effects on Population and Housing,” operation of plants, mines, and facilities would provide a range of employment opportunity depending on size and capacity. While implementation of State SIP Strategy would produce long-term employment, it would be anticipated that a sufficient employment base would be available. The minimal increase in employment opportunity would not create an increased demand on recreational facilities within communities containing new plants and facilities.

As a result, short-term construction-related and long-term operational impacts, associated with the State SIP Strategy, on recreation would be **less-than-significant**.

17. Transportation and Traffic

Impact 17-1: Short-Term Construction-Related Impacts on Traffic and Transportation

Reasonably foreseeable compliance responses associated with the State SIP Strategy include: increased infrastructure for natural gas and hydrogen refueling stations; increased demand for lithium battery manufacturing and associated increases in lithium mining and exports; increased recycling or refurbishment of lithium batteries; increased emission testing of vehicles which may cause construction of new testing centers to monitor vehicle emissions throughout the State. It is anticipated that the replacement rate of on-road light-duty and heavy-duty vehicles, as well as off-road equipment and engines, would be increased, requiring that older models are sold outside of California, scrapped, or recycled. Compliance responses could also include construction and operation of new manufacturing facilities to support near-zero and ~~near-zero~~ zero-emission technologies and increased manufacturing of low-NOx engines. Finally, increased Low-Emission Diesel demand stimulated by implementation of a

Low-Emission Diesel standard is anticipated to increase cultivation or imports of Low-Emission Diesel fuels or feedstocks. Increased Low-Emission Diesel demand may increase processing of Low-Emission Diesel fuels, and shipment of finished Low-Emission Diesel fuels and/or their feedstocks. Infrastructure to support collection, processing, and distribution of Low-Emission Diesel fuels, including biomethane, and associated feedstocks may also increase.

Although detailed information about potential specific construction activities is not currently available, it would be anticipated to result in short-term construction traffic (primarily motorized) from worker commute- and material delivery-related trips. The amount of construction activity would vary depending on the particular type, number, and duration of usage for the varying equipment, and the phase of construction. These variations would affect the amount of project-generated traffic for both worker commute trips and material deliveries. Depending on the amount of trip generation and the location of new facilities, implementation could conflict with applicable programs, plans, ordinances, or policies (e.g., performance standards, congestion management); and/or result in hazardous design features and emergency access issues from road closures, detours, and obstruction of emergency vehicle movement, especially due to project-generated heavy-duty truck trips.

The short-term construction-related impacts associated with the State SIP Strategy on traffic and transportation would be potentially significant.

These impacts on transportation and traffic could be reduced to a less-than-significant level by mitigation that can and should be implemented by local lead agencies, but is beyond the authority of ARB.

Mitigation Measure 17-1

The Regulatory Setting in Attachment 1 includes applicable laws and regulations in regards to transportation. ARB does not have the authority to require implementation of mitigation related to new or modified facilities that would be approved by local jurisdictions. The ability to require such measures is under the purview of jurisdictions with local or State land use approval and/or permitting authority. New or modified facilities in California would qualify as a “project” under CEQA. The jurisdiction with primary approval authority over a proposed action is the Lead Agency, which is required to review the proposed action for compliance with CEQA statutes. Project-specific impacts and mitigation would be identified during the environmental review by agencies with project-approval authority. Recognized practices that are routinely required to avoid and/or minimize construction traffic impacts include:

- Proponents of new or modified facilities or infrastructure constructed as a result of reasonably foreseeable compliance responses would coordinate with State or local land use agencies to seek entitlements for development including the completion of all necessary environmental review requirements (e.g., CEQA). The local or State land use agency or

governing body must follow all applicable environmental regulations as part of approval of a project for development.

- Based on the results of the environmental review, proponents would implement all feasible mitigation to reduce or substantially lessen the potentially significant scenic or aesthetic impacts of the project. Actions required to mitigate potentially significant traffic impacts may include the following; however, any mitigation specifically required for a new or modified facility would be determined by the local lead agency.
  - Minimize the number and length of access, internal, service, and maintenance roads and use existing roads when feasible.
  - Provide for safe ingress and egress to/from the proposed project site. Identify road design requirements for any proposed roads, and related road improvements.
  - If new roads are necessary, prepare a road siting plan and consult standards contained in federal, State, or local requirements. The plans should include design and construction protocols to meet the appropriate roadway standards and be no larger than necessary to accommodate their intended functions (e.g., traffic volume and weight of vehicles). Access roads should be located to avoid or minimize impacts to washes and stream crossings, follow natural contours and minimize side-hill cuts. Roads internal to a project site should be designed to minimize ground disturbance. Excessive grades on roads, road embankments, ditches, and drainages should be avoided, especially in areas with erodible soils.
  - Prepare a Construction Traffic Control Plan and a Traffic Management Plan.

Because the authority to determine project-level impacts and require project-level mitigation lies with land use and/or permitting agencies for individual projects, and that the programmatic analysis does not allow project-specific details of mitigation, there is inherent uncertainty in the degree of mitigation ultimately implemented to reduce the potentially significant impacts.

Consequently, while impacts could be reduced to a less-than-significant level by land use and/or permitting agency conditions of approval, this ~~Draft~~ Final EA takes the conservative approach in its post-mitigation significance conclusion and discloses, for CEQA compliance purposes, that the short-term construction-related traffic and transportation impacts associated with the State SIP Strategy would be **potentially significant and unavoidable**.

Impact 17-2: Long-Term Operational Impacts on Traffic and Transportation

Reasonably foreseeable compliance responses associated with the State SIP Strategy include operation of new manufacturing facilities to support increased market penetration of PHEV, non-combustion ZEV including BEVs and hydrogen FCEV zero-emission technologies, and electric-powered equipment (e.g., forklifts). Increased use of near-zero and zero-emission technologies may result in increased infrastructure for natural gas and hydrogen refueling and charging stations, and increased demand for lithium battery manufacturing and associated increases in lithium mining and exports. New testing centers to monitor vehicle emissions may be operated throughout the State. In addition, increased Low-Emission Diesel demand stimulated by implementation of a Low-Emission Diesel standard is anticipated to increase cultivation or imports of Low-Emission Diesel fuels or feedstocks. Increased Low-Emission Diesel demand may increase processing of Low-Emission Diesel fuels, and shipment of finished Low-Emission Diesel fuels and/or their feedstocks. Infrastructure to support collection, processing, and distribution of Low-Emission Diesel fuels, including biomethane, and associated feedstocks may also increase.

Implementation of the State SIP Strategy could result in increased demand for Low-Emission Diesel fuels such as renewable diesel or biomethane, and increased demand for feedstocks and inputs used to produce Low-Emission Diesel. While the total volume of fuel demanded in California is not anticipated to be affected by the proposed Low-Emission Diesel measure, it is anticipated to change the types of fuels consumed, which could result in substantial effects on local routes' traffic patterns due to differences in where feedstocks are sourced, and how the finished fuels are transported. These effects depend on feedstock demand and processing needs in a particular area. In addition, transportation patterns may change in relation to the location and operational shipping needs of new facilities. Depending on the amount of trips generated and the location of fuel-related deliveries, implementation could conflict with applicable programs, plans, ordinances, or policies (e.g., performance standards, congestion management); and/or result in hazardous design features and emergency access issues from road closures, detours, and obstruction of emergency vehicle movement, especially due to project-generated heavy-duty truck trips.

Thus, long-term operational impacts on traffic and transportation would be potentially significant.

These impacts on transportation and traffic could be reduced to a less-than-significant level by mitigation that can and should be implemented by local lead agencies, but is beyond the authority of ARB.

Mitigation Measure 17-2: Implement Mitigation Measure 17-1

Because the authority to determine operational impacts and require operational mitigation lies with land use and/or permitting agencies for individual projects, and that the programmatic analysis does not allow project-specific details of mitigation, there is

inherent uncertainty in the degree of mitigation ultimately implemented to reduce the potentially significant impacts.

Consequently, while impacts could be reduced to a less-than-significant level by land use and/or permitting agency conditions of approval, this ~~Draft~~ Final EA takes the conservative approach in its post-mitigation significance conclusion and discloses, for CEQA compliance purposes, that the long-term operational impacts on traffic and transportation associated with the State SIP Strategy would be **potentially significant and unavoidable**.

18. Utilities and Service Systems

Impact 18-1: Short-Term Construction Related and Long-Term Operational Impacts on Utilities and Service Systems

Reasonably foreseeable compliance responses associated with the State SIP Strategy include: increased infrastructure for natural gas and hydrogen refueling stations; increased demand for lithium battery manufacturing and associated increases in lithium mining and exports; increased recycling or refurbishment of lithium batteries; increased emission testing of vehicles which may cause construction of new testing centers to monitor vehicle emissions throughout the State. It is anticipated that the replacement rate of on-road light-duty and heavy-duty vehicles, as well as off-road equipment and engines, would be increased, requiring that older models are sold outside of California, scrapped, or recycled. Compliance responses could also include construction and operation of new manufacturing facilities to support near-zero and ~~near-zero~~ zero-emission technologies and increased manufacturing of low-NOx engines. Finally, increased Low-Emission Diesel demand stimulated by implementation of a Low-Emission Diesel standard is anticipated to increase cultivation or imports of Low-Emission Diesel fuels or feedstocks. Increased Low-Emission Diesel demand may increase processing of Low-Emission Diesel fuels, and shipment of finished Low-Emission Diesel fuels and/or their feedstocks. Infrastructure to support collection, processing, and distribution of Low-Emission Diesel fuels, including biomethane, and associated feedstocks may also increase.

Implementation of the State SIP Strategy could result in an increased rate in turnover of vehicle fleets to increase the use of zero-emission technologies. Generally, cars, trucks, buses, and other equipment that would be replaced as a result of the State SIP Strategy would be recycled or shipped for use outside of California. Vehicles that are recycled, rather than reused, would be subject to existing laws and regulations governing solid waste handling requirements. Disposal of any portion of vehicles, including batteries, would be subject to, and be in compliance with existing laws and regulations governing solid waste, such as California's Universal Waste Rule (Cal. Code Regs., tit. 22, Chapter 23). There may be an increase in the amount of solid waste diverted to landfills as a result of increased fleet turnover rates; however, it would not be substantial enough to result in closure of an existing landfill or development of a new landfill because much of the vehicles and equipment would be recycled or scrapped.

Reasonably foreseeable compliance responses associated with the State SIP Strategy could result in new demand for water, wastewater, electricity, and gas services for new manufacturing facilities. Generally, facilities would be sited in areas with existing utility infrastructure—or areas where existing utility infrastructure is easily assessable. New or modified utility installation, connections, and expansion would be subject to the requirements of the applicable utility providers. Changes in land use, associated with biofuel feedstock production are likely to change water demand to support new crop types, depending on the size, location, and existing uses. This could result in an increase or decrease in water demand, and would be subject to availability and regulatory requirements.

Any new or modified facilities, regardless of size and location would be required to seek local or State land use approvals prior to their development. In addition, part of the land use entitlement process for facilities proposed in California requires that each of these projects undergo environmental review consistent with the requirements of CEQA and the CEQA Guidelines. It is assumed that facilities proposed in other states would be subject to comparable federal, State, and/or local environmental review requirements (e.g., CEQA) and that the environmental review process would assess whether adequate utilities and services (i.e., wastewater services, water supply services, solid waste facilities) would be available and whether the project would result in the need to expand or construct new facilities to serve the project. Through the environmental review process, utility and service demands would be calculated; agencies would provide input on available service capacity and the potential need for service-related infrastructure including expansions to waste water treatment plants, new water supply entitlements and infrastructure, storm water infrastructure, and solid waste handling capacity (e.g., landfills). Resulting environmental impacts would also be determined through this process.

At this time, the specific location and type of construction needs are not known and would be dependent upon a variety of market factors that are not within the control of ARB including: economic costs, product demands, environmental constraints, and other market constraints. Thus, the specific impacts from construction on utility and service systems cannot be identified with any certainty, and individual compliance responses could potentially result in significant environmental impacts for which it is unknown whether mitigation would be available to reduce the impacts.

Thus, short-term construction related and long-term operational impacts on utilities and services systems, associated with the State SIP Strategy would be potentially significant.

This impact could be reduced to a less-than-significant level by mitigation that can and should be implemented by local lead agencies, but is beyond the authority of ARB and not within its purview.

Mitigation Measure 18-1

The Regulatory Setting in Attachment 1 includes applicable laws and regulations that relate to utilities and service systems. ARB does not have the authority to require implementation of mitigation related to new or modified facilities that would be approved by local jurisdictions. The ability to require such measures is under the purview of jurisdictions with local or State land use approval and/or permitting authority. New or modified facilities in California would qualify as a "project" under CEQA. The jurisdiction with primary approval authority over a proposed action is the Lead Agency, which is required to review the proposed action for compliance with CEQA statutes. Project-specific impacts and mitigation would be identified during the environmental review by agencies with project-approval authority. Recognized practices that are routinely required to avoid and/or minimize utility and service-related impacts include:

- Proponents of new or modified facilities or infrastructure constructed as a result of reasonably foreseeable compliance responses would coordinate with State or local land use agencies to seek entitlements for development including the completion of all necessary environmental review requirements (e.g., CEQA). The local or State land use agency or governing body must follow all applicable environmental regulations as part of approval of a project for development.

- Based on the results of the environmental review, proponents would implement all feasible mitigation to reduce or substantially lessen the potentially significant scenic or aesthetic impacts of the project. Actions required to mitigate potentially significant utility or service-related impacts may include the following; however, any mitigation specifically required for a new or modified facility would be determined by the local lead agency.

    - Comply with local plans and policies regarding the provision of water supply, wastewater treatment, and storm water drainage utilities, and solid waste services.
    - Where an on-site wastewater system is proposed, submit a permit application to the appropriate local jurisdiction.
    - Where appropriate, prepare a Water Supply Assessment (WSA) consistent with the requirements of Section 21151.9 of the PRC/ Section 10910 et seq. of the Water Code. The WSA would be approved by the local water agency/purveyor prior to construction of the project.
    - Comply with local plans and policies regarding the provision of wastewater treatment services.

Because the authority to determine project-level impacts and require project-level mitigation lies with land use and/or permitting agencies for individual projects, and the programmatic analysis does not allow project-specific details of mitigation, there is

inherent uncertainty in the degree of mitigation ultimately implemented to reduce the potentially significant impacts.

Consequently, while impacts could be reduced to a less-than-significant level by land use and/or permitting agency conditions of approval, this ~~Draft~~ Final EA takes the conservative approach in its post-mitigation significance conclusion and discloses, for CEQA compliance purposes, that short-term construction-related and long-term operational impacts to utilities and service systems resulting from the operation of new facilities associated with the State SIP Strategy would be **potentially significant and unavoidable**.

5.0 CUMULATIVE AND GROWTH-INDUCING IMPACTS

A. Introduction

Cumulative impacts on the environment result from the incremental contribution of a proposed project considered in combination with the related, adverse effects of other past, present, and reasonably foreseeable probable future actions. (Cal. Code Regs., tit. 14, § 15355 (b).) Cumulative impacts can result from individually minor but collectively significant actions taking place over time.

Under ARB's certified regulatory program for implementing CEQA, substitute environmental documents are prepared in lieu of EIRs. In doing so, to be consistent with the goals and policies of CEQA, ARB follows the general guidance of CEQA in considering the potential cumulative impacts resulting from implementation of the recommended actions included in the State SIP Strategy. CEQA states that cumulative impacts should be addressed when the project's incremental contribution to the impact would be cumulatively considerable. (Cal. Code Regs., tit. 14, § 15130 (a).) "Cumulatively considerable" means the incremental effects of an individual project are significant when viewed in combination with the effects of past, current, and probable future projects." (Cal. Code Regs., tit. 14, § 15065 (a)(3).)

The discussion of cumulative impacts need not provide as much detail as the discussion of impacts attributable to the project alone. (Cal. Code Regs., tit. 14, § 15130.) Where a lead agency is examining a project with an incremental impact that is not "cumulatively considerable," a lead agency need not consider that impact significant, but must briefly describe its basis for concluding that the incremental impact is not cumulatively considerable.

B. Approach to the Cumulative Analysis

CEQA identifies two basic methods for establishing the cumulative context within which a project is considered: (1) the use of a list of past, present, and probable future projects; or (2) the use of adopted projections from a general plan, other regional planning document, or a certified EIR for such a planning document. (Cal. Code Regs., tit. 14, § 15130.) A combination of these approaches may also be used. The following describes the approach used for evaluating the cumulative impacts of the proposed State SIP Strategy.

Because of the statewide reach of the State SIP Strategy and the longer-term future horizon for achievement of emission reductions, the impact analyses for the resource topics in Chapter 4 are programmatic in that they address the statewide context, rather than site-specific or project-specific effects. The document contains a description and analysis of a series of reasonably foreseeable compliance actions that are part of a statewide program. Recommended mitigation measures in Chapter 4 provide generally recognized methods to reduce potentially significant impacts, but do not offer details related to specific project locations, because the locations cannot be known at this time.

As a result of the statewide context of the environmental analysis, the impact conclusions and mitigation measures in the resource-oriented sections of Chapter 4 are cumulative by nature, because they describe the potential impacts associated collectively with the full range of reasonably foreseeable compliance responses.

For purposes of disclosure and broad consideration of the potential cumulative impacts of actions that address air quality at the State level, ARB has identified relevant projects that would result in related impacts. These consist of the First Update to the Scoping Plan (adopted in 2014) and the 2030 Target Scoping Plan Update (currently in preparation), prepared in accordance with AB 32 (Statutes of 2006); the Low Carbon Fuel Standard and Alternative Diesel Fuel Commercialization Regulations; and Regional Transportation Plan (RTP) / Sustainable Community Strategies (SCSs) prepared to comply with SB 375 (Statutes of 2008). Similar to the analysis presented in Chapter 4 of this ~~Draft~~ Final EA, the cumulative impacts analysis is described at a necessarily general level of detail, because information related to specific actions is not feasible at this time. This approach to a cumulative impacts analysis is "guided by the standards of practicality and reasonableness" (Cal. Code Regs., tit. 14, § 15130 (b)) and serves the purpose of providing "a context for considering whether the incremental effects of the project at issue are considerable" when judged "against the backdrop of the environmental effects of other projects." (*CBE v. Cal. Res. Agency* (2002) 103 Cal.App.4th 98, 119.)

C. Significance Determinations and Mitigation

Implementation of the State SIP Strategy would potentially result in cumulatively considerable contributions to significant cumulative impacts related to certain resource areas, as discussed below. While recommended mitigation is provided for each potential cumulatively considerable contribution to a significant impact, other agencies would be responsible for implementing the mitigation measures. Consequently, it is uncertain whether mitigation measures would be implemented, which precludes assurance that significant impacts would be avoided. Where impacts cannot feasibly be mitigated, the ~~Draft~~ Final EA recognizes the impact as significant and unavoidable. The Board will need to adopt Findings and a Statement of Overriding Considerations for any significant and unavoidable environmental effects of the State SIP Strategy as part of the approval process.

D. Projects Resulting in Related Effects

CEQA Guidelines state that a previously approved plan may be used in cumulative impacts analysis, that the pertinent discussion of cumulative impacts contained in one or more previously certified EIR(s) may be incorporated by reference, and that in certain circumstances, no further cumulative impact analysis is required for a project that is consistent with a plan that has a certified EIR. (Cal. Code Regs., tit. 14, § 15130 (d)). The most relevant, plans and programs for considering cumulative impacts of the State SIP Strategy are the AB 32 Scoping Plan Update (both the first update, adopted in 2014

and the 2030 target update currently in preparation), LCFS/ADF Regulations, and SCSs pursuant to implementation of SB 375. The EA for the first update of the Scoping Plan provided a programmatic environmental evaluation of that plan (ARB 2014), from which relevant information is either summarized or referenced. The 2030 Target Scoping Plan Update, currently in preparation, will be addressed in its own EA; however, as of this writing, its environmental impact evaluations have not yet been completed, and therefore its environmental impacts are not yet known. The cumulative analysis of the State SIP Strategy assumes for the purposes of this analysis that the 2030 target update would continue the programs adopted in the 2014 First Update to the Scoping Plan.

To evaluate the environmental consequences of SB 375 implementation, the impacts reported in EIRs for the 17 approved RTP/SCSs are considered. Because litigation related to the San Diego Association of Governments (SANDAG) Sustainable Communities Strategy EIR has not yet been resolved, the SANDAG EIR was not included in this discussion. Environmental impacts associated with Scoping Plan, LCFS/ADF program, and the SCSs, as they relate to a cumulative analysis in combination with the State SIP Strategy, are described in Section 5.E, below.

CEQA Guidelines allow for incorporation by reference for all or portions of other documents. Incorporation by reference is useful for including long, descriptive, or technical materials that provide general background but do not contribute directly to the pertinent analysis. (Cal. Code Regs., tit. 14, § 15150.) Therefore, the following documents are incorporated by reference.

- Final Environmental Analysis for the First Update to the Climate Change Scoping Plan (ARB 2014)
- Final Environmental Analysis for the LCFS/ADF Regulations (ARB 2015b)
- Association of Bay Area Governments (ABAG) Plan Bay Area EIR (ABAG 2013)
- Association of Monterey Bay Area Governments (AMBAG) 2035 Metropolitan Transportation Plan (MTP) and SCS (AMBAG 2010)
- Butte County Association of Governments MTP EIR (BCAG 2012)
- Fresno Council of Governments (COG) 2014 RTP and SCS Program EIR (Fresno COG 2014)
- Kern Council of Governments 2014 RTP and SCS Program EIR (Kern COG 2014)
- Kings County Association of Governments 2014 RTP Program EIR (Kings COG 2014)

- Madera County Transportation Commission (CTC) 2014 RTP and SCS Draft Supplemental EIR (Madera CTC 2014)
- Merced County 2014 RTP and SCS Supplemental EIR (Merced CAG 2014a) and Initial Study (Merced CAG 2014a)
- Sacramento Area Council of Governments (SACOG) MTP/SCS (SACOG 2015)
- San Joaquin Council of Governments (SJCOG) 2014-2040 RTP and SCS Program EIR (SJCOG 2014)
- San Luis Obispo Council of Governments (SLOCOG) 2010 RTP EIR and 2014 Addendum (SLOCOG 2014)
- Santa Barbara County Association of Governments (SBCAG) 2040 RTP and SCS EIR (SBCAG 2013)
- Shasta Regional Transportation Agency (SRTA) 2015 RTP EIR (SRTA 2015)
- Southern California Association of Governments (SCAG) 2012-2035 RTP/SCS Program EIR (SCAG 2012)
- Stanislaus Council of Governments (StanCOG) 2014 RTP and SCS EIR (StanCOG 2014)
- Tahoe Metropolitan Planning Organization (TMPO) and Tahoe Regional Planning Agency (TRPA) Mobility 2035 EIR/EIS (TMPO and TRPA 2012)
- Tulare County Association of Governments 2014-2040 RTP/SCS (TulareCOG 2014)

The portions of these documents relevant to this discussion are also summarized below and within the respective resource area analyses. These documents are available upon request from ARB.

1. Scoping Plan Update

The Scoping Plan Update EA provided a program-level review of significant adverse impacts associated with the reasonably foreseeable compliance responses that appeared most likely to occur as a result of implementing the recommended actions identified in each of the nine sectors discussed in the Scoping Plan Update. The impact discussion includes, where relevant, construction-related effects, operational effects of new or modified facilities, and influences of the recommended actions on GHG and air pollutant emissions. The Scoping Plan Update EA, certified by the Board in 2014, was

prepared as a program environmental document for the entire statewide plan of GHG reductions projects, including several recommendations included in the State SIP Strategy. The EA is available online at http://www.arb.ca.gov/cc/scopingplan/scopingplan.htm

The Scoping Plan Update considered nine sectors: energy, transportation, agriculture, water waste management, natural and working lands, short-lived climate pollutants, green buildings, and cap-and-trade regulation. The compliance responses associated with these sectors are described as follows.

a) Energy Sector under the Scoping Plan Update

Reasonably foreseeable compliance responses evaluated in the Scoping Plan Update EA ranged from small modifications to existing structures to utility-scale renewable energy projects. For instance, the EA considered energy storage systems that could be developed by modifying existing hydroelectric dams; and smart-grid technology such as the installation of smart meters. Improvements to energy production, processing, storage, distribution, and transmission systems were considered to be minimal, and consist of general housekeeping, vapor recovery valves, and frequent maintenance checks. In addition, renewable energy projects were considered, including the installation of solar panels and micro-turbines onto buildings (e.g., to create zero net energy buildings or combined heat and power systems) to large-scale energy generation facilities, such as solar photovoltaic and wind turbine farms, and geothermal plants.

b) Transportation Sector under the Scoping Plan Update

The Scoping Plan Update contains four main types of recommended actions associated with the Transportation Sector: (1) improve vehicle efficiency and develop zero-emission technologies; (2) reduce the carbon content of fuels and provide market support to encourage the use of these fuels; (3) plan for and develop communities that would minimize vehicular GHG emissions and provide more transportation options; and (4) improve the efficiency and throughput of existing transportation systems. Reasonably foreseeable compliance responses evaluated in the Scoping Plan Update EA consisted of an increased demand for, and associated manufacturing of, a variety of alternative fuel and/or low- and zero-emission technologies and related fueling infrastructure. Increased demand for products, such as standard hybrid, plug-in hybrid electric, battery electric, and fuel-cell vehicles and trucks, were determined to require development of new and/or modified manufacturing plants. In addition, installation of fixed-guideway systems to transport shipment containers, installed at marine ports and near dock railyards, were evaluated. Additionally, deployment of carbon capture and sequestration projects were evaluated as potential compliance responses.

c) Agriculture Sector under the Scoping Plan Update

The types of recommended actions for the Agriculture Sector involve GHG emission reduction and carbon sequestration opportunities. Reasonably foreseeable compliance responses evaluated in the Scoping Plan Update consisted of nitrogen management, manure management, soil management practices, water and fuel technologies, and land use planning to enhance, protect, and conserve lands in California.

d) Water Sector under the Scoping Plan Update

The Proposed Update describes three types of recommended actions to reduce water-related energy use: (1) prioritizing investments in conservation; (2) adopting rate structures and pricing that maximize conservation; and (3) promoting less-energy intensive water management, such as a comprehensive groundwater policy. Reasonably foreseeable compliance responses evaluated under the Water Sector in the Scoping Plan Update primarily related to the development of policies, guidance, and funding plans. These plans generally aim to provide energy conservation and efficiency measures associated with water supply, conservation, water recycling, stormwater reuse, and wastewater-to-energy goals. These actions could result in the reasonably foreseeable compliance responses of increased development of water resource facilities, such as water recycling facilities, detention structures for reuse of stormwater, and wastewater treatment-related capture of biogas for energy use. Development of new and/or modified recycled water and wastewater plants could occur.

e) Waste Management Sector under the Scoping Plan Update

The Scoping Plan Update EA evaluated programs that would eliminate disposal of organic materials at landfills. Options considered included: legislation, direct regulation, and inclusion of landfills in Cap-and-Trade. Implementation of the recommended actions in the Waste Management sector were determined to result in construction of new, or expansion of existing, composting and anaerobic digestion facilities. These facilities would be necessary to accommodate actions such as increased recycling, development of biomass facilities, and anaerobic digestion facilities. In addition, reasonably foreseeable compliance responses may include installation of methane control devices at existing landfills. While some of these activities could occur within existing landfills, construction of new facilities may be necessary to accommodate increased demand of organic waste diversion.

f) Natural and Working Lands Sector under the Scoping Plan Update

The Scoping Plan Update addressed planning efforts aimed at urban, natural and working lands, and agricultural croplands within and across jurisdictions, which all are considered to create interconnected land areas and ecosystems. Reasonably foreseeable compliance responses involve coordination between state agencies including: California Natural Resources Agency, California Environmental Protection

Agency, California Department of Food and Agriculture, California Department of Forestry and Fire Protection, California Department of Fish and Wildlife, and ARB to develop land use programs. These programs generally aim to increase urban forest canopy cover and limit the conversion of croplands, forests, rangeland, and wetlands to urban uses. In addition, increased use of green infrastructure was evaluated, such as vegetation and soils to manage stormwater runoff, rainwater harvesting, bioswales, permeable pavement, and green (e.g., growing media and vegetation) roofs. In addition to land use planning efforts, the Natural and Working Land Sector included encouragement of the use of urban, agricultural, and forest wastes to produce electricity and transportation fuels (e.g., biomass facilities).

g) Short-Lived Climate Pollutants Sector under the Scoping Plan Update

Under the Scoping Plan Update, the short-lived climate pollutant sector addressed ozone depleting substances (ODS), a large group of chemicals known to destroy the stratospheric ozone layer when released into the atmosphere. ODS were historically used in a wide variety of applications, including refrigerants, foam blowing agents, solvents, and fire suppressants. Four general concepts were associated with the Short-Lived Climate Pollutants Sector within the Scoping Plan Update Update: high-global warming potential (GWP) fluorinated gas phasedown, low-GWP requirements, ODS recovery and destruction, and high-GWP fees. Reasonably foreseeable compliance responses consisted of replacement of high-GWP compounds with low-GWP compounds, which was considered to require construction of new manufacturing facilities or modification of existing manufacturing facilities.

h) Green Buildings Sector under the Scoping Plan Update

The Scoping Plan Update EA evaluated development of a comprehensive GHG emission reduction program for new construction, existing building retrofits, and operation and maintenance of certified green buildings. This program would include an integrated approach to development of zero-net-carbon buildings (i.e., net zero carbon emissions over a period of a year). Reasonably foreseeable compliance responses associated with these recommended actions could consist of new requirements that result in an increase in zero net energy and zero-net-carbon buildings. This could be accomplished through increased carbon sequestering features (e.g., urban forestry), onsite renewable energy supplies (e.g., solar, wind turbines, waste digesters), fuel cells, and construction of carbon offset technologies, including solar PV or wind turbine farms.

i) Cap-and-Trade Regulation Sector under the Scoping Plan Update

Under the Scoping Plan Update, the Cap-and-Trade Regulation was considered to be a vital component for achieving California's longer-term, emission-reduction goals. The Cap-and-Trade Regulation creates a gradually declining limit on the sources responsible for 85 percent of California's GHG emissions, establishes the price signal

needed to drive long-term investment in cleaner fuels and more efficient use of energy, and affords covered entities the flexibility to seek out and implement the lowest-cost options to reduce emissions. The Cap-and-Trade Regulation places an aggregated emissions cap on the total emissions generated by all covered facilities in the program. Over time, the cap will steadily decline. Reasonably foreseeable compliance responses evaluated under the Scoping Plan Update include the existing Cap-and-Trade Regulation's provision allowing for additional offset protocols: U.S. Forest Projects, Urban Forest Projects, Livestock Projects, and ODS Compliance, as well as the provisions regarding sector-based offset crediting programs. In addition, compliance responses related to covered entities under the Cap-and-Trade Regulation consist of upgrading equipment, switching to lower intensity carbon fuels, and implementing maintenance and process changes at existing facilities.

The Scoping Plan Update EA evaluated the environmental impacts related to the reasonably foreseeable compliance responses described above. Table 5-1 provides a summary of the conclusions of these impacts.

Table 5-1
Summary of Scoping Plan Update EA Impacts by Sector

	Energy Sector	Transportation Sector	Agriculture Sector	Water Sector	Waste Management Sector	Natural and Working Lands Sector	Short-Lived Climate Pollutants Sector	Green Buildings	Cap-and-Trade Regulation 2
Aesthetics									
Short-Term Construction Impacts	SU	SU	LTS	SU	SU	SU	SU	SU	LTS
Long-Term Operational Impacts	SU	SU	LTS	SU	SU	SU	SU	SU	
Agriculture and Forest Resources									
Short-Term Construction Impacts	SU	SU	LTS	SU	SU	SU	SU	SU	PSU
Long-Term Operational Impacts	SU	SU	B	SU	SU	SU	SU	SU	
Air Quality									
Short-Term Construction Impacts	SU	SU	LTS	SU	SU	SU	SU	SU	LTS
Long-Term Operational Impacts	LTS	SU	B	LTS	LTS/ SU[1]	SU	LTS	B	

Table 5-1
Summary of Scoping Plan Update EA Impacts by Sector

	Energy Sector	Transportation Sector	Agriculture Sector	Water Sector	Waste Management Sector	Natural and Working Lands Sector	Short-Lived Climate Pollutants Sector	Green Buildings	Cap-and-Trade Regulation 2
Biological Resources									
Short-Term Construction Impacts	SU	SU	LTS	SU	SU	SU	SU	SU	PSU
Long-Term Operational Impacts	SU	SU	B	SU	SU	LTS	SU	SU	
Cultural Resources									
Short-Term Construction Impacts	SU	SU	LTS	SU	SU	SU	SU	SU	PSU
Long-Term Operational Impacts	NA	NA	NA	NA	NA	NA	NA	NA	
Energy Demand									
Short-Term Construction Impacts	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	B
Long-Term Operational Impacts	B	B	B	LTS	B	B	LTS	B	
Geology and Soils									
Short-Term Construction Impacts	SU	SU	LTS	SU	SU	SU	SU	SU	PSU
Long-Term Operational Impacts	SU	SU	LTS	SU	SU	SU	SU	SU	
Greenhouse Gas									
Short-Term Construction Impacts	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS
Long-Term Operational Impacts	B	B	B	B	B	LTS	B	B	B
Hazards and Hazardous Materials									
Short-Term Construction Impacts	SU	SU	LTS	SU	SU	SU	SU	SU	LTS
Long-Term Operational Impacts	SU	LTS	LTS	LTS	LTS	LTS	LTS	LTS	

Table 5-1
Summary of Scoping Plan Update EA Impacts by Sector

	Energy Sector	Transportation Sector	Agriculture Sector	Water Sector	Waste Management Sector	Natural and Working Lands Sector	Short-Lived Climate Pollutants Sector	Green Buildings	Cap-and-Trade Regulation 2
Hydrology and Water Quality									
Short-Term Construction Impacts	SU	SU	B	SU	SU	SU	SU	SU	PSU
Long-Term Operational Impacts	SU	SU	B	SU	SU	B	SU	SU	
Land Use Planning									
Short-Term Construction Impacts	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	PSU
Long-Term Operational Impacts	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	
Mineral Resources									
Short-Term Construction Impacts	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS
Long-Term Operational Impacts	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	
Noise									
Short-Term Construction Impacts	SU	SU	LTS	SU	SU	SU	SU	SU	PSU
Long-Term Operational Impacts	SU	LTS	LTS	LTS	LTS	SU	LTS	SU	
Population and Housing									
Short-Term Construction Impacts	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS
Long-Term Operational Impacts	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	
Public Services									
Short-Term Construction Impacts	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS
Long-Term Operational Impacts	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	

Table 5-1
Summary of Scoping Plan Update EA Impacts by Sector

	Energy Sector	Transportation Sector	Agriculture Sector	Water Sector	Waste Management Sector	Natural and Working Lands Sector	Short-Lived Climate Pollutants Sector	Green Buildings	Cap-and-Trade Regulation 2
Recreation									
Short-Term Construction Impacts	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS
Long-Term Operational Impacts	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	
Transportation/Traffic									
Short-Term Construction Impacts	SU	SU	LTS	SU	SU	SU	SU	SU	PSU
Long-Term Operational Impacts	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	
Utilities and Service Systems									
Short-Term Construction Impacts	NA	NA	NA	NA	NA	NA	NA	NA	LTS
Long-Term Operational Impacts	SU	SU	LTS	SU	SU	SU	SU	SU	

Notes: B = Beneficial; LTS = Less-Than-Significant; NA = Not Applicable; SU = Potentially Significant and Unavoidable After Mitigation.
[1]Long-term operational impacts were identified as LTS, but odor-related impacts were identified as significant and unavoidable in the Waste Management sector.
[2] Impacts related to the Cap-and-Trade regulation include the effects associated with offset protocol adopted after the adoption of the Cap-and-Trade regulation

The 2030 Target Scoping Plan Update is currently in development and a draft plan is scheduled to be released in 2016. The types of activities related to the 2030 target update, and their associated environmental effects are currently not known, but are expected to continue the programs adopted in the first update to the Scoping Plan, plus other actions. Thus, while the 2030 Target Scoping Plan Update is considered to be a future related project, the potential cumulative effects are not yet known and cannot be known at this time, except as they relate to continuation of programs from the first update.

2. Low Carbon Fuel Standard and Alternative Diesel Fuels Commercialization Regulations

Since approval of the Scoping Plan Update, the LCFS/ADF regulations have been approved. The LCFS/ADF regulations require transportation fuel providers to procure clean fuels to reduce the carbon intensity of California's fuel mix. The LCFS provides a market signal to incentivize the use of low-carbon intensity fuels, such as ethanol, renewable gasoline, hydrogen, electricity, renewable diesel, biodiesel, and using captured methane as a transportation fuel, among other clean fuel options. The regulation is market-based and fuel-neutral. The incentive structure of the program is anticipated to shift the types of locations from which feedstocks used for to produce ethanol toward lower-carbon options, to increase the use of biomass-based fuels such as biodiesel and/or renewable diesel in lieu place of petroleum, and to encourage the use of electricity and other zero-emission fuels. A separate EA has been prepared to evaluate the environmental effects of implementing the proposed LCFS and ADF, which was certified in 2015. The EA is available online at http://www.arb.ca.gov/regact/2015/lcfs2015/lcfs2015.htm.

Reasonably foreseeable compliance responses addressed in the LCFS/ADF regulation EA included incentives for various projects, such as: processing plants for agriculture-based ethanol, cellulosic ethanol, and biomethane. The EA also evaluated the potential for incentives to result in minor expansions to existing operations, such as: collection of natural gas from landfills, dairies, and wastewater treatment plants; modifications to crude production facilities (onsite solar, wind, heat, and/or steam generation electricity); and installation of energy management systems at refineries. In addition, reasonably foreseeable compliance responses included the development of carbon capture and sequestration facilities and operation of expanded fixed guideway systems.

The LCFS/ADF regulation EA evaluated the environmental impacts related to the reasonably foreseeable compliance responses described above. Table 5-2 provides a summary of the impacts described in the LCFS/ADF regulation EA.

Table 5-2
Summary of LCFS/ADF EA Environmental Impacts and Mitigation Measures

Resource Area Impact Significance Before Mitigation	Significance Conclusion
Aesthetics	
Impact 1.a: Short-Term Construction-Related and Long-Term Operational Impacts on Aesthetics	PSU
Agriculture Resources	
Impact 2.a: Conversion of Agricultural and Forest Resources Related to New Facilities	PSU
Impact 2.b: Agricultural and Forest Resource Impacts Related to Feedstock Cultivation	PSU
Air Quality	

Table 5-2
Summary of LCFS/ADF EA Environmental Impacts and Mitigation Measures

Resource Area Impact Significance Before Mitigation	Significance Conclusion
Impact 3.a: Short-Term Construction-Related Air Quality Impacts	PSU
Impact 3.b: Long-Term Operational Air Quality Emissions	B
Impact 3.c: Short-Term Construction-Related and Long-Term Operational Impacts from Odors	LTS
Biological Resources	
Impact 4.a: Short-Term Construction-Related and Long-Term Impacts on Biological Resources Related to New Facilities	PSU
Impact 4.b: Effects of Biological Resources Associated with Land Use Changes	PSU
Cultural Resources	
Impact 5.a: Short-Term Construction-Related Impacts on Cultural Resources	PSU
Energy Demand	
Impact 6.a: Short Term Construction-Related Impacts on Energy Demand	LTS
Impact 6.b: Long-Term Operational Impacts on Energy Demand	B
Geology, Soils and Minerals	
Impacts 7.a: Short-Term Construction-Related and Long-Term Operational Effects on Geology and Soil Related to New Facilities	PSU
Impact 7.b: Long-Term Operational Impacts Associated with Carbon Capture and Sequestration Projects	PSU
Impact 7.c: Long-Term Operational Impacts to Geology and Soil Associated with Land Use Changes	PSU
Greenhouse Gas Emissions	
Impact 8.a: Short-Term Construction- and Long-term Operational Related Greenhouse Gas Impacts	B
Hazards and Hazardous Materials	
Impact 9.a: Short-Term Construction-Related Hazard Impacts	PSU
Impact 9.b: Long-Term Increased Transport, Use, and Disposal of Hazardous Materials	LTS
Impact 9.c: Long-Term Operational Hazards Related to Carbon Capture and Sequestration	PSU
Hydrology and Water Quality	
Impact 10.a: Short-Term Construction-Related and Long-Term Operational Hydrologic Resource Impacts	PSU
Impact 10.b: Long-Term Effects on Hydrology and Water Quality Related to Changes in Land Use	PSU
Impact 10.c: Long-Term Impacts on Hydrology and Water Quality Related to Carbon Capture and Sequestration Projects	PSU

Table 5-2
Summary of LCFS/ADF EA Environmental Impacts and Mitigation Measures

Resource Area Impact Significance Before Mitigation	Significance Conclusion
Land Use and Planning	
Impact 11.a: Short-Term Construction-Related Impacts Related to New or Modified Facilities	PSU
Impact 11.b: Long-Term Operational Impacts Related to Feedstock Production	PSU
Mineral Resources	
Impact 12.a: Short-Term Construction-Related Impacts and Long-Term Operational Impacts on Mineral Resources	LTS
Noise	
Impact 13.a: Short-Term Construction-Related Noise Impacts	PSU
Impact 13.b: Long-Term Operational Noise Impacts	LTS
Population and Housing	
Impact 14.a: Short-Term Construction-Related Impacts and Long-Term Operational Impacts on Population, Employment, and Housing	LTS
Public Services	
Impact 15.a: Short-Term Construction-Related Impacts and Long-Term Operational Impacts on Public Services	LTS
Recreation	
Impact 16.a: Short-Term Construction-Related Impacts and Long-Term Operational Impacts on Recreation	LTS
Transportation and Traffic	
Impact 17.a: Short-Term Construction-Related Impacts on Traffic and Transportation	PSU
Impact 17.b: Long-Term Operational Impacts on Traffic and Transportation	PSU
Utilities and Service Systems	
Impact 18.a: Increased Demand for Water, Wastewater, Electricity, and Gas Services	PSU
Notes: B=beneficial impact; LTS=less-than-significant impact; PSU=potentially significant and unavoidable impact; LCFS/ADF=Low Carbon Fuel Standard/Alternative Diesel Fuels; EA=Environmental Analysis Potentially significant and unavoidable indicates that mitigation measures have been recommended. However, the authority to determine project-level impacts and require project-level mitigation lies with land use and/or permitting agencies for individual projects, and the programmatic level of analysis associated with this EA. Thus, there is inherent uncertainty in the degree of mitigation that may ultimately be implemented to reduce potentially significant impacts and they are therefore considered to be potentially significant and unavoidable.	

3. SB 375 Implementation

SB 375 supports the State's climate action goals to reduce GHG emissions through coordinated transportation and land use planning with the goal of more sustainable communities. SCSs are developed by regional metropolitan planning organizations (MPOs) and involve coordination with: local, regional, and states agencies; community groups; advocates; and other public stakeholders. Approved SCSs contain land use policies and transportation strategies recognized to reduce GHG emissions associated with vehicle miles travelled (VMT) for cars and light trucks (i.e., passenger vehicles). A summary of the types of strategies and reasonably foreseeable compliance responses associated with land use and transportation strategies, described in approved SCSs, are provided as follow.

a) Land Use Strategies

It would be expected that to further reduce passenger vehicle-related GHG emissions, mixed use, high density, and infill development would be applied in areas where such development is feasible. Land use strategies include infill development, increased residential and mixed-use density planning and construction, Transit Oriented Development (i.e., concentrated development within ½ mile from transit centers), and preservation of open space. Potential compliance responses related to land use strategies include planning and construction of housing, commercial and industrial development focused in urban areas, and preservation of open space.

b) Transportation Strategies

Transportation strategies reduce passenger vehicle-related emissions through various physical changes in the availability of form of transportation other than single occupancy vehicles. Alterations in road structure, transit and infrastructure investments, incentive programs, and advancements in technology comprise the backbone of transportation strategies. Strategies included in approved SCSs include the following:

- Active Transportation/Complete Streets
  - Active transportation (walking and bicycling) requires design and infrastructure to support safe and efficient movement of pedestrians and bicyclists. Walking and bicycling opportunities can be provided through the establishment of walking-only and bicycling-only routes within a community. Greenbelts containing bike lanes and walking paths may be developed to ensure rider and pedestrian safety associated with the dangers of automobiles.
  - A complete street is composed of dedicated lanes for all forms of transportation. These include sidewalks for pedestrians, bike lanes for bicyclists, lanes for single occupancy vehicles, and designated rails and/or routes for transit vehicles (e.g., light rail, bus rapid transit). The

design of a complete street aims to maximize the safety and efficiency of all types of transportation.

- Increased Transit Operations and Efficiency
  - Transit operations and efficiency can be improved through increased transit destination and frequency of service. Priority lanes and rails for transit vehicles (e.g. bus rapid transit, commuter rails) can additionally improve service times. In addition, natural gas powered, ZEV, and PHEV buses and electric commuter rails can be incorporated into transit systems to reduce GHGs.

- Transportation Demand Management
  - Transportation Demand Management includes strategies designed to influence and alter consumer behaviors. Local jurisdictions can use incentives to elicit changes in what modes of transportation are used. For example, managed lanes for carpools, vanpools, buses, and shuttles reduces time loss related to traffic. The ability to bypass traffic during peak hours is an attractive benefit and can to influence consumers during vehicle purchase.

- Transportation Systems Management
  - Transportation Systems Management strategies include physically altering roadways to enhance the efficiency of transportation to reduce GHG emissions. TSM aims to reduce the emissions by streamlining traffic patterns, through improvements such as: stop sign with roundabout, traffic signaling optimization, ramp metering, and routine roadway maintenance.

- ZEV and PHEV Charging Infrastructure
  - ZEVs and PHEVs provide near-zero and ~~near-zero~~ zero-emission replacements for existing single occupancy vehicles. Consistent with the goals of existing regulations (e.g., Advanced Clean Cars), MPOs and local jurisdictions would provide hydrogen fueling and electric charging infrastructure to support a future ZEV and PHEV fleet.

Reasonably foreseeable compliance responses associated with the implementation transportation strategies include a variety of improvements to roadways and new infrastructure. Roadway improvements include construction of bicycle and pedestrian lanes and facilities, high occupancy vehicle lanes, traffic calming infrastructure (e.g., roundabouts, ramp metering), and increased maintenance activities. New infrastructure associated with approved SCSs includes commuter rail lines, electric charging and hydrogen fueling infrastructure, and new manufacturing or modified facilities to accommodate increased use of ZEVs and PHEVs.

The list of EIRs prepared by individual MPOs are listed above. The environmental impacts disclosed in these documents are summarized below, in Table 5-3.

Table 5.3
Summary of Impacts Associated with Approved SCSs

MPO / Resource Section	ABAG	AMBAG	BCAG	Fresno COG	Kern COG	Kings CAG	Madera CTC	Merced CAG	SACOG	SJCOG	SBCAG	SCAG	SLOCOG	SRTA	StanCOG	TMPO / TRPA	Tulare COG
Aesthetics	SU	SU	LTS/ M	SU	SU	SU	SU	LTS	SU	SU	SU	SU	SU	LTS/ M	SU	LTS/ M	SU
Agricultural and Forest Resources	SU	SU	SU	SU	SU	SU	SU	LTS	SU	SU	SU	SU	SU	SU	SU	N/A	SU
Air Quality	SU	LTS/ M	LTS/ M	SU	SU	LTS/ M	SU	LTS/ M	SU	SU	LTS/ M	SU	LTS/ M	LTS/ M	SU	LTS/ M	LTS/ M
Biological Resources	SU	SU	LTS/ M	SU	SU	SU	SU	LTS/ M	LTS/ M	SU	SU	SU	SU	SU	SU	LTS/ M	SU
Cultural Resources	SU	SU	SU	SU	SU	SU	SU	LTS/ M	SU	SU	SU	SU	LTS/ M	SU	SU	LTS/ M	LTS/ M
Energy Demand	LTS	LTS	LTS	SU	SU	LTS/ M	SU	LTS	LTS/ M	SU	LTS/ M	SU	LTS	LTS/ M	LTS/ M	N/A	LTS/ M
Geology and Soils	LTS/ M	LTS/ M	LTS	SU	SU	LTS/ M	SU	LTS	LTS/ M	SU	LTS/ M	SU	LTS/ M	LTS/ M	SU	LTS	LTS/ M
Greenhouse Gas	SU	LTS/ M	LTS	SU	SU	LTS/ M	SU	SU	LTS	SU	LTS/ M	SU	LTS	LTS/ M	SU	SU	LTS/ M
Hazards and Hazardous Materials	SU	LTS	LTS/ M	SU	SU	LTS	SU	LTS	SU	SU	LTS	SU	LTS/ M	LTS	LTS	LTS/ M	LTS
Hydrology and Water Quality	LTS/ M	LTS/ M	LTS/ M	SU	SU	LTS/ M	SU	LTS	LTS/ M	SU	LTS/ M	SU	LTS/ M	LTS/ M	SU	LTS	LTS/ M

Table 5.3
Summary of Impacts Associated with Approved SCSs

MPO / Resource Section	ABAG	AMBAG	BCAG	Fresno COG	Kern COG	Kings CAG	Madera CTC	Merced CAG	SACOG	SJCOG	SBCAG	SCAG	SLOCOG	SRTA	StanCOG	TMPO / TRPA	Tulare COG
Land Use and Planning	LTS	LTS/M	LTS/M	SU	SU	LTS/M	SU	LTS	LTS	SU	LTS/M	SU	LTS/M	LTS/M	LTS/M	LTS	LTS/M
Mineral Resources	NI	NI	LTS	SU	SU	LTS	SU	LTS	LTS/M	SU	NI	SU	NI	NI	LTS	N/A	NI
Noise	SU	LTS/M	LTS/M	SU	SU	LTS/M	SU	LTS	SU	SU	LTS/M	SU	SU	LTS/M	SU	LTS/M	LTS/M
Population and Housing	SU	LTS/M	LTS	SU	SU	LTS/M	SU	LTS	LTS	SU	LTS/M	SU	LTS	LTS/M	SU	LTS/M	LTS/M
Public Services	SU	LTS	LTS	SU	SU	LTS	SU	LTS	LTS/M	SU	LTS	SU	LTS/M	LTS	LTS	LTS/M	LTS
Recreation	SU	LTS	LTS	SU	SU	LTS	SU	LTS	LTS/M	SU	LTS	SU	NI	LTS	LTS	LTS	LTS
Transportation /Traffic	SU	LTS	SU	SU	SU	LTS	SU	SU	SU	SU	SU	SU	SU	LTS	LTS	LTS/M	LTS
Utilities and Service Systems	SU	LTS	LTS	SU	SU	LTS/M	SU	LTS	SU	SU	LTS/M	SU	LTS/M	LTS/M	SU	LTS/M	LTS/M

Notes: LTS=Less-Than-Significant; LTS/M= Less-Than-Significant after mitigation; SU=Significant and Unavoidable; N/A=not applicable or not evaluated; NI=No Impact; MPO=Metropolitan Planning Organization; CAG=County Association of Governments; COG=Council of Governments; ABAG=Association of Bay Area Governments; AMBAG=Association of Monterey Bay Area Governments; BCAG=Butte County Association of Governments; SACOG=Sacramento Area Council of Governments Metropolitan; SBCAG=Santa Barbara County Association of Governments; SCAG Southern California Association of Governments; SJCOG=San Joaquin Council of Governments; SLOCOG=San Luis Obispo Council of

Table 5.3
Summary of Impacts Associated with Approved SCSs

MPO / Resource Section	ABAG	AMBAG	BCAG	Fresno COG	Kern COG	Kings CAG	Madera CTC	Merced CAG	SACOG	SJCOG	SBCAG	SCAG	SLOCOG	SRTA	StanCOG	TMPO / TRPA	Tulare COG

Governments; SRTA=Shasta Regional Transportation Agency; StanCOG=Stanislaus Council of Governments; TMPO=Tahoe Metropolitan Planning Organization; TRPA=Tahoe Regional Planning Agency; TulareCOG=Tulare County Association of Governments

1. This table provides a conservative overview of the significant impacts disclosed in certified environmental documents, showing the greatest level of impact for individual topics within a resources area. In some cases significant and unavoidable impact designations shown in this table may be reduced to a less-than-significant level, but the respective MPO does not have authority to implement feasible mitigation measures that could reduce significant environmental effects or the project-specific impacts and need for mitigation are not known.
2. Some MPOs organized topics within resources areas slightly different that evaluated in this ~~Draft~~ Final EA. To provide consistency and a meaningful analysis, impacts conclusions in this table were categorized according to the thresholds defined in the resources section of this ~~Draft~~ Final EA (e.g., agricultural impacts may have been evaluated in the Land Use and Planning section, but have been separated out in this table).
3. The San Diego RTP/SCS is currently in litigation and is not included in this table or cumulative analysis

Source: ABAG 2013; AMBAG 2010; BCAG 2012; Fresno COG 2014; Kern COG 2014; Kings COG 2014; Madera CTC 2014; Merced CAG 2014a; Merced CAG 2014a; SACOG 2015; SJCOG 2014; SLOCOG 2014; SBCAG 2013; SRTA 2015; SCAG 2012; StanCOG 2014; TMPO and TRPA 2012; TulareCOG 2014

E. Cumulative Impacts

1. Aesthetics

Table 5-4
Summary of Aesthetic Impacts under Related Projects and State SIP Strategy

	Scoping Plan Update [1]	LCFS/ADF Regulation	MPO SCSs [2]	State SIP Strategy
Significance Conclusion	SU	PSU	SU	PSU

Notes: LCSF/ADF=Low Carbon Fuel Standard/Alternative Diesel Fuels; MPO SCSs=Metropolitan Planning Organization Sustainable Community Strategies; SIP=State Implementation Plan; PSU=potentially significant and unavoidable: [1] Significance conclusions under the Scoping Plan Update column indicate the greatest level of impacts (e.g., potentially significant and unavoidable) reported under the nine sectors, see Table 5-1 for more detailed information; [2] Significance conclusions under the MPO SCSs column indicate the greatest level of impacts (e.g., potentially significant and unavoidable) reported in an approved SCS EIR, see Table 5-3 for more detailed information;

Implementation of the reasonably foreseeable compliance responses associated with the recommended actions in the State SIP Strategy could require construction and operational activities associated with new or modified facilities or infrastructure. Individual projects could affect aesthetic resources, such as: public infrastructure to support PHEVs and non-combustion ZEVs, including battery electric vehicles (BEVs) and hydrogen fuel cell electric vehicle (FCEV) zero-emission technologies, and manufacturing facilities to support compliance responses. There is uncertainty as to the specific location of new facilities or the modification of existing facilities. In addition, increased low-emission diesel demand may increase cultivation or imports of low-emission diesel feedstocks, processing of low-emission diesel fuels, and shipment of finished low-emission diesel fuels and/or their feedstocks. Infrastructure to support collection, processing, and distribution of low-emission diesel fuels and feedstock may also increase. Construction and operation of these reasonably foreseeable compliance responses (although likely to occur in areas zoned or used for manufacturing or industrial purposes), could conceivably introduce or increase the presence of artificial elements (e.g., heavy-duty equipment, removal of existing vegetation, buildings) in areas of scenic importance, such as visibility from a State scenic highway.

Implementation of the Scoping Plan Update, LCFS/ADF regulations, and SCSs adopted by MPOs would include the reasonably foreseeable compliance responses described above under Section 5.D. As summarized in Table 5-4, the Scoping Plan Update EA and the LCFS/ADF regulation EA identified potentially significant and unavoidable impacts on aesthetics. Implementation of approved SCSs associated with ABAG, AMBAG, Fresno COG, Kern COG, Kings CAG, Madera CTC, SACOG, San Joaquin COG, SBCAG, SCAG, SLOCOG, StanCOG, TMPO/TRPA, and TulareCOG would

result in significant and unavoidable impacts to aesthetic resources (Table 5-3). Thus, implementation of these programs could result in a significant cumulative effect.

The State SIP Strategy's contribution to this significant impact would be cumulatively considerable due to the development of new facilities and mining activities that could affect the visual quality and character of a landscape or scenic vista. Implementation of the project-level mitigation identified in Chapter 4 could effectively reduce the incremental contribution from the State SIP Strategy to a less-than-considerable level, but authority to require that mitigation will rest with other agencies that will be authorizing site-specific projects, and not with ARB. Thus the State SIP Strategy could result in a **cumulatively considerable contribution to a significant cumulative impact** on aesthetic resources.

2. Agriculture and Forest Resources

Table 5-5
Summary of Agriculture and Forest Resources Impacts under Related Projects and State SIP Strategy

	Scoping Plan Update [1]	LCFS/ADF Regulation	MPO SCSs [2]	State SIP Strategy
Significance Conclusion	SU	PSU	SU	PSU

Notes: LCSF/ADF=Low Carbon Fuel Standard/Alternative Diesel Fuels; MPO SCSs=Metropolitan Planning Organization Sustainable Community Strategies; SIP=State Implementation Plan; PSU=potentially significant and unavoidable: [1] Significance conclusions under the Scoping Plan Update column indicate the greatest level of impacts (e.g., potentially significant and unavoidable) reported under the nine sectors, see Table 5-1 for more detailed information; [2] Significance conclusions under the MPO SCSs column indicate the greatest level of impacts (e.g., significant and unavoidable) reported in an approved SCS EIR, see Table 5-3 for more detailed information;

Reasonably foreseeable compliance responses associated with the State SIP Strategy include construction and operation of new manufacturing facilities to support increased market penetration of PHEV, non-combustion ZEV including BEVs and hydrogen FCEV zero-emission technologies, and electric-powered equipment (e.g., forklifts). In addition, increased low-emission diesel demand stimulated by implementation of a low-emission diesel standard is anticipated to increase cultivation or imports of low-emission diesel fuels or feedstocks. Increased low-emission diesel demand may increase processing of low-emission diesel fuels, and shipment of finished low-emission diesel fuels and/or their feedstocks. Infrastructure to support collection, processing, and distribution of low-emission diesel fuels, including biomethane, and associated feedstocks may also increase. New facilities could be located on Prime Farmland, Unique Farmland, Farmland of Statewide Importance, Williamson Act conservation contracts, forest land

or timberland. In addition, increased low-emission diesel feedstock production could alter the location and extent of fuel-based agricultural feedstock cultivation and production. Demand for low-emission diesel feedstocks could displace food-based production on agricultural land currently used for row crops, orchards, and grazing. This increased demand could potentially result in indirect land use changes where food-based agriculture could shift to other areas; thereby, increasing pressure for conversion of rangeland, grassland, forests, and other uses to agriculture.

Implementation of the Scoping Plan Update, LCFS/ADF regulations, and SCSs adopted by MPOs would include the reasonably foreseeable compliance responses described above under Section 5.D. As summarized in Table 5-5, the Scoping Plan Update EA and the LCFS/ADF regulation EA identified potentially significant and unavoidable impacts on agricultural and forest resources. SCSs associated with ABAG, AMBAG, BCAG, Fresno COG, Kern COG, Kings CAG, Madera CTC, SACOG, San Joaquin COG, SBCAG, SCAG, SLOCOG, SRTA, StanCOG, and TulareCOG would result in significant and unavoidable impacts to agricultural and forest resources (Table 5-3). Thus, implementation of these programs could result in a significant cumulative effect.

The State SIP Strategy's contribution to this significant impact would be cumulatively considerable due to the development of new facilities and indirect land use changes where food-based agriculture could shift to other areas. Implementation of the project-level mitigation identified in Chapter 4 could effectively reduce the incremental contribution from the State SIP Strategy to a less-than-considerable level, but authority to require that mitigation will rest with other agencies that will be authorizing site-specific projects, and not with ARB. Thus the State SIP Strategy could result in a **cumulatively considerable contribution to a significant cumulative impact** on agricultural and forest resources.

3. Air Quality

Table 5-6
Summary of Air Quality Impacts under Related Projects and State SIP Strategy

	Scoping Plan Update [1]	LCFS/ADF Regulation	MPO SCSs [2]	State SIP Strategy
Significance Conclusion	SU	PSU	SU	PSU

Notes: LCSF/ADF=Low Carbon Fuel Standard/Alternative Diesel Fuels; MPO SCSs=Metropolitan Planning Organization Sustainable Community Strategies; SIP=State Implementation Plan; PSU=potentially significant and unavoidable: [1] Significance conclusions under the Scoping Plan Update column indicate the greatest level of impacts (e.g., potentially significant and unavoidable) reported under the nine sectors, see Table 5-1 for more detailed information; [2] Significance conclusions under the MPO SCSs column indicate the greatest level of impacts (e.g., potentially significant and unavoidable) reported in an approved SCS EIR, see Table 5-3 for more detailed information;

Reasonably foreseeable compliance responses associated with the State SIP Strategy include construction and operation of new manufacturing facilities to support increased market penetration of PHEV, non-combustion ZEV including BEVs and hydrogen FCEV zero-emission technologies, and electric-powered equipment (e.g., forklifts). Increased use of near-zero and ~~near-zero~~ zero-emission technologies may result in increased infrastructure for natural gas and hydrogen refueling and charging stations, and increased demand for lithium battery manufacturing and associated increases in lithium mining and exports. New testing centers to monitor vehicle emissions may be constructed throughout the State. Finally, increased low-emission diesel demand stimulated by implementation of a low-emission diesel standard is anticipated to increase cultivation or imports of low-emission diesel fuels or feedstocks. Increased low-emission diesel demand may increase processing of low-emission diesel fuels, and shipment of finished low-emission diesel fuels and/or their feedstocks. Infrastructure to support collection, processing, and distribution of low-emission diesel fuels, including biomethane, and associated feedstocks may also increase. Criteria air pollutants and toxic air contaminants could be generated from a variety of activities and emission sources. These emissions would be temporary and occur intermittently depending on the intensity of construction on a given day.

Implementation of the Scoping Plan Update, LCFS/ADF regulations, and SCSs adopted by MPOs would include the reasonably foreseeable compliance responses described above under Section 5.D. As summarized in Table 5-6, the Scoping Plan Update EA and the LCFS/ADF regulation EA identified potentially significant and unavoidable impacts on air quality emissions. SCSs associated with ABAG, Fresno COG, Kern COG, Madera CTC, SACOG, San Joaquin COG, SCAG, and StanCOG would result in significant and unavoidable impacts to air quality emissions (Table 5-3). Thus, implementation of these programs could result in a significant cumulative effect.

The State SIP Strategy's contribution to this significant impact would be cumulatively considerable due to short-term construction-related activities. Implementation of the project-level mitigation identified in Chapter 4 could effectively reduce the incremental contribution from the State SIP Strategy to a less-than-considerable level, but authority to require that mitigation will rest with other agencies that will be authorizing site-specific projects, and not with ARB. Thus the State SIP Strategy could result in a **cumulatively considerable contribution to a significant cumulative impact** on air quality emissions.

Overall, the State SIP Strategy would result in substantial long-term reductions in criteria and toxic air pollutants. As discussed in Chapter 4 of this ~~Draft~~ Final EA, the State SIP Strategy would result in beneficial long-term operational impacts related to air quality. Statewide, implementation of the State SIP Strategy is anticipated to result in emission reductions of 206 tons per day of NOx, 67 tons per day ROG and 2 tons per day of PM2.5. Thus, in the long term, the State SIP Strategy **would not result in a cumulatively considerable contribution to a significant cumulative impact** on air quality emissions.

4. Biological Resources

Table 5-7
Summary of Biological Resources Impacts under Related Projects and State SIP Strategy

	Scoping Plan Update [1]	LCFS/ADF Regulation	MPO SCSs [2]	State SIP Strategy
Significance Conclusion	SU	PSU	SU	PSU

Notes: LCSF/ADF=Low Carbon Fuel Standard/Alternative Diesel Fuels; MPO SCSs=Metropolitan Planning Organization Sustainable Community Strategies; SIP=State Implementation Plan; PSU=potentially significant and unavoidable: [1] Significance conclusions under the Scoping Plan Update column indicate the greatest level of impacts (e.g., potentially significant and unavoidable) reported under the nine sectors, see Table 5-1 for more detailed information; [2] Significance conclusions under the MPO SCSs column indicate the greatest level of impacts (e.g., potentially significant and unavoidable) reported in an approved SCS EIR, see Table 5-3 for more detailed information;

Reasonably foreseeable compliance responses associated with the State SIP Strategy include construction and operation of new manufacturing facilities to support increased market penetration of PHEV, non-combustion ZEV including BEVs and hydrogen FCEV zero-emission technologies, and electric-powered equipment (e.g., forklifts). Finally, increased low-emission diesel demand stimulated by implementation of a low-emission diesel standard is anticipated to increase cultivation or imports of low-emission diesel fuels or feedstocks. Increased low-emission diesel demand may increase processing of low-emission diesel fuels, and shipment of finished low-emission diesel fuels and/or their feedstocks. Infrastructure to support collection, processing, and distribution of low-emission diesel fuels, including biomethane, and associated feedstocks may also increase. Biological resources could be affected by the construction of new manufacturing plants, biofuel facilities, or near-zero and ~~near-zero~~ zero-emission-related infrastructure. Additionally, increased demand for biofuel feedstock production could result in expansion of agricultural lands into undeveloped areas, or areas that otherwise support biological resources.

Implementation of the Scoping Plan Update, LCFS/ADF regulations, and SCSs adopted by MPOs would include the reasonably foreseeable compliance responses described above under Section 5.D. As summarized in Table 5-7, the Scoping Plan Update EA and the LCFS/ADF regulation EA identified potentially significant and unavoidable impacts on biological resources. SCSs associated with ABAG, AMBAG, Fresno COG, Kern COG, Kings CAG, Madera CTC, San Joaquin COG, SBCAG, SCAG, SLOCOG, SRTA, StanCOG, and TulareCOG would result in significant and unavoidable impacts to biological resources (Table 5-3). Thus, implementation of these programs could result in a significant cumulative effect.

The State SIP Strategy's contribution to this significant impact would be cumulatively considerable due to construction of new manufacturing plants, biofuel facilities, infrastructure, and expansion of agricultural lands into undeveloped areas. Implementation of the project-level mitigation identified in Chapter 4 could effectively reduce the incremental contribution from the State SIP Strategy to a less-than-considerable level, but authority to require that mitigation will rest with other agencies that will be authorizing site-specific projects, and not with ARB. Thus the State SIP Strategy could result in a **cumulatively considerable contribution to a significant cumulative impact** on biological resources.

5. Cultural Resources

Table 5-8
Summary of Cultural Resources Impacts under Related Projects and State SIP Strategy

	Scoping Plan Update [1]	LCFS/ADF Regulation	MPO SCSs [2]	State SIP Strategy
Significance Conclusion	PSU	PSU	SU	PSU

Notes: LCSF/ADF=Low Carbon Fuel Standard/Alternative Diesel Fuels; MPO SCSs=Metropolitan Planning Organization Sustainable Community Strategies; SIP=State Implementation Plan; PSU=potentially significant and unavoidable: [1] Significance conclusions under the Scoping Plan Update column indicate the greatest level of impacts (e.g., potentially significant and unavoidable) reported under the nine sectors, see Table 5-1 for more detailed information; [2] Significance conclusions under the MPO SCSs column indicate the greatest level of impacts (e.g., potentially significant and unavoidable) reported in an approved SCS EIR, see Table 5-3 for more detailed information;

Reasonably foreseeable compliance responses associated with the State SIP Strategy include construction and operation of new manufacturing facilities to support increased market penetration of PHEV, non-combustion ZEV including BEVs and hydrogen FCEV zero-emission technologies, and electric-powered equipment (e.g., forklifts). Finally, increased low-emission diesel demand stimulated by implementation of a low-emission diesel standard is anticipated to increase cultivation or imports of low-emission diesel fuels or feedstocks. Increased low-emission diesel demand may increase processing of low-emission diesel fuels, and shipment of finished low-emission diesel fuels and/or their feedstocks. Infrastructure to support collection, processing, and distribution of low-emission diesel fuels, including biomethane, and associated feedstocks may also increase. The cultural resources that could potentially be affected by ground disturbance activities include, but are not limited to, prehistoric and historical archaeological sites, tribal cultural resources, paleontological resources, historic buildings, structures, or archaeological sites associated with agriculture and mining, and heritage landscapes.

Implementation of the Scoping Plan Update, LCFS/ADF regulations, and SCSs adopted by MPOs would include the reasonably foreseeable compliance responses described above under Section 5.D. As summarized in Table 5-8, the Scoping Plan Update EA and the LCFS/ADF regulation EA identified potentially significant and unavoidable impacts on cultural resources. SCSs associated with ABAG, AMBAG, BCAG, Fresno COG, Kern COG, Kings CAG, Madera CTC, SACOG, San Joaquin COG, SBCAG, SCAG, SRTA, and StanCOG would result in significant and unavoidable impacts to cultural resources (Table 5-3). Thus, implementation of these programs could result in a significant cumulative effect.

The State SIP Strategy's contribution to this significant impact would be cumulatively considerable due to construction in areas that may contain significant prehistoric or historic-era cultural resources. Implementation of the project-level mitigation identified in Chapter 4 could effectively reduce the incremental contribution from the State SIP Strategy to a less-than-considerable level, but authority to require that mitigation will rest with other agencies that will be authorizing site-specific projects, and not with ARB. Thus the State SIP Strategy could result in a **cumulatively considerable contribution to a significant cumulative impact** on cultural resources.

6. Energy Demand

Table 5-9
Summary of Energy Demand Impacts under Related Projects and State SIP Strategy

	Scoping Plan Update [1]	LCFS/ADF Regulation	MPO SCSs [2]	State SIP Strategy
Significance Conclusion	LTS	LTS	SU	LTS

Notes: LCSF/ADF=Low Carbon Fuel Standard/Alternative Diesel Fuels; MPO SCSs=Metropolitan Planning Organization Sustainable Community Strategies; SIP=State Implementation Plan; PSU=potentially significant and unavoidable: [1] Significance conclusions under the Scoping Plan Update column indicate the greatest level of impacts (e.g., potentially significant and unavoidable) reported under the nine sectors, see Table 5-1 for more detailed information; [2] Significance conclusions under the MPO SCSs column indicate the greatest level of impacts (e.g., potentially significant and unavoidable) reported in an approved SCS EIR, see Table 5-3 for more detailed information;

Reasonably foreseeable compliance responses associated with the State SIP Strategy include construction and operation of new manufacturing facilities to support increased market penetration of PHEV, non-combustion ZEV including BEVs and hydrogen FCEV zero-emission technologies, electric-powered equipment (e.g., forklifts), and collection, processing, and distribution of low-emission diesel fuels. While energy would be required to complete construction for any new or modified facilities or infrastructure

projects, it would be temporary and limited in magnitude such that a reasonable amount of energy would be expended. In the long term, the State SIP Strategy would increase the amount of renewable energy supplies because vehicular fuels would increase the use of electricity (50 percent of which would be renewable by 2030), and decrease the use of petroleum through increased use of PHEVs, ZEVs, and low-emission diesel fuels.

Implementation of the Scoping Plan Update, LCFS/ADF regulations, and SCSs adopted by MPOs would include the reasonably foreseeable compliance responses described above under Section 5.D. As summarized in Table 5-9, the Scoping Plan Update EA and the LCFS/ADF regulation EA identified less-than-significant impacts on energy demand. SCSs associated with Fresno COG, Kern COG, Madera CTC, SACOG, San Joaquin COG, and SCAG would result in significant and unavoidable impacts to energy demand (Table 5-3). Thus, implementation of these programs could result in a significant cumulative effect.

The State SIP Strategy's contribution to this significant impact would not be cumulatively considerable because new every demands would be temporary and limited in magnitude such that a reasonable amount of energy would be expended. In the long-term, the amount of renewable energy supplies would increase and the use of petroleum-based fuel demands would decrease. As discussed in Chapter 4 of this Draft Final EA, short-term construction-related impacts on energy demand would be less-than-significant and long-term operational impacts would be beneficial. Thus the State SIP Strategy **would not result in a cumulatively considerable contribution to a significant cumulative impact** on energy demand.

7. Geology and Soils

Table 5-10
Summary of Geology and Soils Impacts under Related Projects and State SIP Strategy

	Scoping Plan Update [1]	LCFS/ADF Regulation	MPO SCSs [2]	State SIP Strategy
Significance Conclusion	SU	PSU	SU	PSU

Notes: LCSF/ADF=Low Carbon Fuel Standard/Alternative Diesel Fuels; MPO SCSs=Metropolitan Planning Organization Sustainable Community Strategies; SIP=State Implementation Plan; PSU=potentially significant and unavoidable: [1] Significance conclusions under the Scoping Plan Update column indicate the greatest level of impacts (e.g., potentially significant and unavoidable) reported under the nine sectors, see Table 5-1 for more detailed information; [2] Significance conclusions under the MPO SCSs column indicate the greatest level of impacts (e.g., potentially significant and unavoidable) reported in an approved SCS EIR, see Table 5-3 for more detailed information;

Reasonably foreseeable compliance responses associated with the State SIP Strategy include construction and operation of new manufacturing facilities to support increased market penetration of PHEV, non-combustion ZEV including BEVs and hydrogen FCEV zero-emission technologies, electric-powered equipment (e.g., forklifts). There is uncertainty as to the specific location of new facilities or the modification of existing facilities. In addition, increased low-emission diesel demand stimulated by implementation of a low-emission diesel standard is anticipated to increase cultivation or imports of low-emission diesel fuels or feedstocks. Increased low-emission diesel demand may increase processing of low-emission diesel fuels, and shipment of finished low-emission diesel fuels and/or their feedstocks. Infrastructure to support collection, processing, and distribution of low-emission diesel fuels, including biomethane, and associated feedstocks may also increase. New facilities and infrastructure, and expansion of agricultural lands to support low-emission diesel fuel feedstock, could be located in a variety of geologic, soil, and slope conditions with varying amounts of vegetation that would be susceptible to soil compaction, soil erosion, and loss of topsoil during construction.

Implementation of the Scoping Plan Update, LCFS/ADF regulations, and SCSs adopted by MPOs would include the reasonably foreseeable compliance responses described above under Section 5.D. As summarized in Table 5-10, the Scoping Plan Update EA and the LCFS/ADF regulation EA identified potentially significant and unavoidable impacts on geologic and soil resources. SCSs associated with Fresno COG, Kern COG, Madera CTC, San Joaquin COG, SCAG, and StanCOG would result in significant and unavoidable impacts to geologic and soil resources (Table 5-3). Thus, implementation of these programs could result in a significant cumulative effect.

The State SIP Strategy's contribution to this significant impact would be cumulatively considerable because new facilities and infrastructure could be located in a variety of geologic, soil, and slope conditions with varying amounts of vegetation that would be susceptible to soil compaction, soil erosion, and loss of topsoil during construction. Implementation of the project-level mitigation identified in Chapter 4 could effectively reduce the incremental contribution from the State SIP Strategy to a less-than-considerable level, but authority to require that mitigation will rest with other agencies that will be authorizing site-specific projects, and not with ARB. Thus the State SIP Strategy could result in a **cumulatively considerable contribution to a significant cumulative impact** on geology and soils.

8. Greenhouse Gases

Table 5-11
Summary of Greenhouse Gases Impacts under Related Projects and State SIP Strategy

	Scoping Plan Update [1]	LCFS/ADF Regulation	MPO SCSs [2]	State SIP Strategy
Significance Conclusion	LTS	B	SU	B

Notes: LCSF/ADF=Low Carbon Fuel Standard/Alternative Diesel Fuels; MPO SCSs=Metropolitan Planning Organization Sustainable Community Strategies; SIP=State Implementation Plan; PSU=potentially significant and unavoidable: [1] Significance conclusions under the Scoping Plan Update column indicate the greatest level of impacts (e.g., potentially significant and unavoidable) reported under the nine sectors, see Table 5-1 for more detailed information; [2] Significance conclusions under the MPO SCSs column indicate the greatest level of impacts (e.g., potentially significant and unavoidable) reported in an approved SCS EIR, see Table 5-3 for more detailed information;

Reasonably foreseeable compliance responses associated with the State SIP Strategy include construction and operation of new manufacturing facilities to support increased market penetration of PHEVs, ZEVs, hydrogen FCEVs, and electric-powered equipment. In addition, increased low-emission diesel demand stimulated by implementation of a low-emission diesel standard is anticipated to increase cultivation or imports of low-emission diesel fuels or feedstocks. Increased low-emission diesel demand may increase processing of low-emission diesel fuels, and shipment of finished low-emission diesel fuels and/or their feedstocks. Infrastructure to support collection, processing, and distribution of low-emission diesel fuels, including biomethane, and associated feedstocks may also increase. Overall, the State SIP Strategy would result in substantial long-term GHG reductions, although certain aspects of the State SIP Strategy, related to construction activities, would cause comparatively small GHG emission increases during construction-related activities.

Implementation of the Scoping Plan Update, LCFS/ADF regulations, and SCSs adopted by MPOs would include the reasonably foreseeable compliance responses described above under Section 5.D. As summarized in Table 5-11, the Scoping Plan Update EA and the LCFS/ADF regulation EA identified less-than-significant and beneficial impacts, respectively. SCSs associated with ABAG, Fresno COG, Kern COG, Madera CTC, Merced CAG, San Joaquin COG, SCAG, StanCOG, TMPO, and TulareCOG would result in significant and unavoidable impacts to greenhouse gases (Table 5-3). Thus, implementation of these programs could result in a significant cumulative effect.

The State SIP Strategy's contribution to this significant impact would not be cumulatively considerable because the reductions in GHG emissions associated with the use of low-emission diesel fuels in place of conventional hydrocarbon diesel would

be greater than a comparatively small level of GHG emissions related to construction and operation of facilities associated with the compliance responses, as described above. As discussed in Chapter 4 of this ~~Draft~~ Final EA, short-term construction-related impacts and long-term operational impacts would be beneficial. Thus the State SIP Strategy **would not result in a cumulatively considerable contribution to a significant cumulative impact** on greenhouse gas emissions.

9. Hazards and Hazardous Materials

Table 5-12
Summary of Hazards and Hazardous Materials Impacts under Related Projects and State SIP Strategy

	Scoping Plan Update [1]	LCFS/ADF Regulation	MPO SCSs [2]	State SIP Strategy
Significance Conclusion	SU	PSU	SU	PSU

Notes: LCSF/ADF=Low Carbon Fuel Standard/Alternative Diesel Fuels; MPO SCSs=Metropolitan Planning Organization Sustainable Community Strategies; SIP=State Implementation Plan; PSU=potentially significant and unavoidable: [1] Significance conclusions under the Scoping Plan Update column indicate the greatest level of impacts (e.g., potentially significant and unavoidable) reported under the nine sectors, see Table 5-1 for more detailed information; [2] Significance conclusions under the MPO SCSs column indicate the greatest level of impacts (e.g., potentially significant and unavoidable) reported in an approved SCS EIR, see Table 5-3 for more detailed information;

Reasonably foreseeable compliance responses associated with the State SIP Strategy include construction and operation of new manufacturing facilities to support increased market penetration of PHEV, non-combustion ZEV including BEVs and hydrogen FCEV zero-emission technologies, electric-powered equipment (e.g., forklifts). In addition, increased low-emission diesel demand stimulated by implementation of a low-emission diesel standard is anticipated to increase cultivation or imports of low-emission diesel fuels or feedstocks. Increased low-emission diesel demand may increase processing of low-emission diesel fuels, and shipment of finished low-emission diesel fuels and/or their feedstocks. Infrastructure to support collection, processing, and distribution of low-emission diesel fuels, including biomethane, and associated feedstocks may also increase. Construction of facilities could 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. Because lithium-ion batteries and hydrogen fuel cell systems are designed to substantially reduce the potential for hazardous conditions associated with transport, use and disposal would not be substantial.

Implementation of the Scoping Plan Update, LCFS/ADF regulations, and SCSs adopted by MPOs would include the reasonably foreseeable compliance responses described

above under Section 5.D. As summarized in Table 5-12, the Scoping Plan Update EA and the LCFS/ADF regulation EA identified potentially significant and unavoidable impacts associated with hazards and hazardous materials. SCSs associated with ABAG, Fresno COG, Kern COG, Madera CTC, SACOG, San Joaquin COG, and SCAG would result in significant and unavoidable impacts to hazards and hazardous materials (Table 5-3). Thus, implementation of these programs could result in a significant cumulative effect.

The State SIP Strategy's contribution to this significant impact would be cumulatively considerable due to the potential for substantial releases of hazardous materials into the environment. Implementation of the project-level mitigation identified in Chapter 4 could effectively reduce the incremental contribution from the State SIP Strategy to a less-than-considerable level, but authority to require that mitigation will rest with other agencies that will be authorizing site-specific projects, and not with ARB. Thus the State SIP Strategy could result in a **cumulatively considerable contribution to a significant cumulative impact** on hazards and hazardous materials.

10. Hydrology and Water Quality

Table 5-13
Summary of Hydrology and Water Quality Impacts under Related Projects and State SIP Strategy

	Scoping Plan Update [1]	LCFS/ADF Regulation	MPO SCSs [2]	State SIP Strategy
Significance Conclusion	SU	PSU	SU	PSU

Notes: LCSF/ADF=Low Carbon Fuel Standard/Alternative Diesel Fuels; MPO SCSs=Metropolitan Planning Organization Sustainable Community Strategies; SIP=State Implementation Plan; PSU=potentially significant and unavoidable: [1] Significance conclusions under the Scoping Plan Update column indicate the greatest level of impacts (e.g., potentially significant and unavoidable) reported under the nine sectors, see Table 5-1 for more detailed information; [2] Significance conclusions under the MPO SCSs column indicate the greatest level of impacts (e.g., potentially significant and unavoidable) reported in an approved SCS EIR, see Table 5-3 for more detailed information;

Reasonably foreseeable compliance responses associated with the State SIP Strategy include construction and operation of new manufacturing facilities to support increased market penetration of PHEV, non-combustion ZEV including BEVs and hydrogen FCEV zero-emission technologies, electric-powered equipment (e.g., forklifts). Construction activities could require disturbance of undeveloped areas, such as clearing of vegetation, earth movement and grading, trenching for utility lines, erection of new buildings, and paving of parking lots, delivery areas, and roadways. Specific construction projects would be required to comply with applicable erosion, water quality standards, and waste discharge requirements (e.g., NPDES, stormwater pollution

prevention plan [SWPPP]). Depending on the location of construction activities, there could be adverse effects on drainage patterns and exposure of people or structures to areas susceptible to flood, seiche, tsunami, or mudflow. In addition, increased demand for low-emission diesel feedstocks, such as oilseed crops or tallow, could result in adverse effects on water quality from farming practices result from polluted runoff that contains sediment, nutrients, pathogens, pesticides, metals, and salts.

Implementation of the Scoping Plan Update, LCFS/ADF regulations, and SCSs adopted by MPOs would include the reasonably foreseeable compliance responses described above under Section 5.D. As summarized in Table 5-13, the Scoping Plan Update EA and the LCFS/ADF regulation EA identified potentially significant and unavoidable impacts on hydrology and water quality. SCSs associated with Fresno COG, Kern COG, Madera CTC, San Joaquin COG, SCAG, and StanCOG would result in significant and unavoidable impacts to hydrology and water quality (Table 5-3). Thus, implementation of these programs could result in a significant cumulative effect.

The State SIP Strategy's contribution to this significant impact would be cumulatively considerable because construction activities could be result in adverse effects on drainage patterns and exposure of people or structures to areas susceptible to flood, seiche, tsunami, or mudflow. In addition, there could be increased concentrations of water pollutants in waterways in the State due to increased agricultural activities that may be required to meet demand for new low-emission diesel feedstock. Implementation of the project-level mitigation identified in Chapter 4 could effectively reduce the incremental contribution from the State SIP Strategy to a less-than-considerable level, but authority to require that mitigation will rest with other agencies that will be authorizing site-specific projects, and not with ARB. Thus the State SIP Strategy could result in a **cumulatively considerable contribution to a significant cumulative impact** on hydrology and water quality.

11. Land Use and Planning

Table 5-14
Summary of Land Use and Planning Impacts under Related Projects and State SIP Strategy

	Scoping Plan Update [1]	LCFS/ADF Regulation	MPO SCSs [2]	State SIP Strategy
Significance Conclusion	PSU	PSU	SU	PSU

Notes: LCSF/ADF=Low Carbon Fuel Standard/Alternative Diesel Fuels; MPO SCSs=Metropolitan Planning Organization Sustainable Community Strategies; SIP=State Implementation Plan; PSU=potentially significant and unavoidable: [1] Significance conclusions under the Scoping Plan Update column indicate the greatest level of impacts (e.g., potentially significant and unavoidable) reported under the nine sectors, see Table 5-1 for more detailed information; [2] Significance conclusions under the MPO SCSs column indicate the greatest level of impacts (e.g., potentially

significant and unavoidable) reported in an approved SCS EIR, see Table 5-3 for more detailed information;

Reasonably foreseeable compliance responses associated with the State SIP Strategy include construction of new manufacturing facilities to support increased market penetration of PHEV, non-combustion ZEV including BEVs and hydrogen FCEV zero-emission technologies, and electric-powered equipment (e.g., forklifts). Increased use of near-zero and ~~near-zero~~ zero-emission technologies may result in increased infrastructure for natural gas and hydrogen refueling and charging stations, and increased demand for lithium battery manufacturing and associated increases in lithium mining and exports. In addition, increased low-emission diesel demand stimulated by implementation of a low-emission diesel standard is anticipated to increase cultivation or imports of low-emission diesel fuels or feedstocks. Increased low-emission diesel demand may increase processing of low-emission diesel fuels, and shipment of finished low-emission diesel fuels and/or their feedstocks. Infrastructure to support collection, processing, and distribution of low-emission diesel fuels, including biomethane, and associated feedstocks may also increase. Planning efforts associated with the implementation of compliance responses associated with the State SIP Strategy would be made in coordination with local, State, or federal jurisdictions. Thus, reasonably foreseeable compliance responses would not be anticipated to divide an established community or conflict with a land use or conservation plan.

Implementation of the Scoping Plan Update, LCFS/ADF regulations, and SCSs adopted by MPOs would include the reasonably foreseeable compliance responses described above under Section 5.D. As summarized in Table 5-14, the Scoping Plan Update EA and the LCFS/ADF regulation EA identified potentially significant and unavoidable impacts on land use and planning. SCSs associated with Fresno COG, Kern COG, Madera CTC, San Joaquin COG, and SCAG would result in significant and unavoidable impacts to land use and planning (Table 5-3). Thus, implementation of these programs could result in a significant cumulative effect.

The State SIP Strategy's contribution to this significant impact would not be cumulatively considerable because compliance responses would not be anticipated to divide an established community or conflict with a land use or conservation plan. As discussed in Chapter 4 of this ~~Draft~~ Final EA, short-term construction-related and long-term operation impacts on land use and planning would be less-than-significant. Thus the State SIP Strategy **would not result in a cumulatively considerable contribution to a significant cumulative impact** on land use and planning.

12. Mineral Resources

Table 5-15
Summary of Mineral Resources Impacts under Related Projects and State SIP Strategy

	Scoping Plan Update [1]	LCFS/ADF Regulation	MPO SCSs [2]	State SIP Strategy
Significance Conclusion	LTS	LTS	SU	LTS

Notes: LCSF/ADF=Low Carbon Fuel Standard/Alternative Diesel Fuels; MPO SCSs=Metropolitan Planning Organization Sustainable Community Strategies; SIP=State Implementation Plan; PSU=potentially significant and unavoidable: [1] Significance conclusions under the Scoping Plan Update column indicate the greatest level of impacts (e.g., potentially significant and unavoidable) reported under the nine sectors, see Table 5-1 for more detailed information; [2] Significance conclusions under the MPO SCSs column indicate the greatest level of impacts (e.g., potentially significant and unavoidable) reported in an approved SCS EIR, see Table 5-3 for more detailed information;

Implementation of the reasonably foreseeable compliance responses associated with the recommended actions in the State SIP Strategy could require construction and operational activities associated with new or modified facilities or infrastructure. In addition, increased low-emission diesel demand stimulated by implementation of a low-emission diesel standard is anticipated to increase cultivation or imports of low-emission diesel fuels or feedstocks. Increased low-emission diesel demand may increase processing of low-emission diesel fuels, and shipment of finished low-emission diesel fuels and/or their feedstocks. Infrastructure to support collection, processing, and distribution of low-emission diesel fuels, including biomethane, and associated feedstocks may also increase. These reasonably foreseeable compliance responses would likely occur within existing footprints or in areas with consistent zoning where original permitting and analyses considered the availability of mineral resources within specific project sites. In addition, increased manufacturing and use of PHEVs, ZEVs, and other electric-powered would require increased battery production and increased lithium mining.

Implementation of the Scoping Plan Update, LCFS/ADF regulations, and SCSs adopted by MPOs would include the reasonably foreseeable compliance responses described above under Section 5.D. As summarized in Table 5-15, the Scoping Plan Update EA and the LCFS/ADF regulation EA identified less-than-significant impacts on mineral resources. SCSs associated with Fresno COG, Kern COG, Madera CTC, San Joaquin COG, SCAG, and StanCOG would result in significant and unavoidable impacts to mineral resources (Table 5-3). Thus, implementation of these programs could result in a significant cumulative effect.

The State SIP Strategy's contribution to this significant impact would not be cumulatively considerable because adequate lithium supplies are considered to be available for the foreseeable future and construction activities are expected to be zoned in locations that would not prohibit access to mining activities. As discussed in Chapter 4 of this ~~Draft~~ Final EA, short-term construction-related and long-term operation impacts on mineral resources would be less-than-significant. Thus the State SIP Strategy **would not result in a cumulatively considerable contribution to a significant cumulative impact** on mineral resources.

13. Noise

Table 5-16
Summary of Noise Impacts under Related Projects and State SIP Strategy

	Scoping Plan Update [1]	LCFS/ADF Regulation	MPO SCSs [2]	State SIP Strategy
Significance Conclusion	PSU	PSU	SU	PSU

Notes: LCSF/ADF=Low Carbon Fuel Standard/Alternative Diesel Fuels; MPO SCSs=Metropolitan Planning Organization Sustainable Community Strategies; SIP=State Implementation Plan; PSU=potentially significant and unavoidable: [1] Significance conclusions under the Scoping Plan Update column indicate the greatest level of impacts (e.g., potentially significant and unavoidable) reported under the nine sectors, see Table 5-1 for more detailed information; [2] Significance conclusions under the MPO SCSs column indicate the greatest level of impacts (e.g., potentially significant and unavoidable) reported in an approved SCS EIR, see Table 5-3 for more detailed information;

Reasonably foreseeable compliance responses associated with the State SIP Strategy include construction and operation of new manufacturing facilities to support increased market penetration of PHEV, non-combustion ZEV including BEVs and hydrogen FCEV zero-emission technologies, electric-powered equipment (e.g., forklifts). Implementation of reasonably foreseeable compliance responses could result in the generation of short-term construction noise in excess of applicable standards or that result in a substantial increase in ambient levels at nearby sensitive receptors, and exposure to excessive vibration levels. In additional new sources of noise could be associated with low-emission diesel feedstock processing facilities, manufacturing plants, and mining activities.

Implementation of the Scoping Plan Update, LCFS/ADF regulations, and SCSs adopted by MPOs would include the reasonably foreseeable compliance responses described above under Section 5.D. As summarized in Table 5-16, the Scoping Plan Update EA and the LCFS/ADF regulation EA identified potentially significant and unavoidable impacts on noise. SCSs associated with ABAG, Fresno COG, Kern COG, Madera CTC, SACOG, San Joaquin COG, SCAG, SLOCOG, and StanCOG would result in significant

and unavoidable impacts to noise (Table 5-3). Thus, implementation of these programs could result in a significant cumulative effect.

The State SIP Strategy's contribution to this significant impact would be cumulatively considerable because construction and operation of new facilities and infrastructure could result in new noise sources in close proximity to sensitive receptors. Implementation of the project-level mitigation identified in Chapter 4 could effectively reduce the incremental contribution from the State SIP Strategy to a less-than-considerable level, but authority to require that mitigation will rest with other agencies that will be authorizing site-specific projects, and not with ARB. Thus the State SIP Strategy could result in a **cumulatively considerable contribution to a significant cumulative impact** on noise.

14. Population and Housing

Table 5-17
Summary of Population and Housing Impacts under Related Projects and State SIP Strategy

	Scoping Plan Update [1]	LCFS/ADF Regulation	MPO SCSs [2]	State SIP Strategy
Significance Conclusion	LTS	LTS	SU	LTS

Notes: LCSF/ADF=Low Carbon Fuel Standard/Alternative Diesel Fuels; MPO SCSs=Metropolitan Planning Organization Sustainable Community Strategies; SIP=State Implementation Plan; PSU=potentially significant and unavoidable: [1] Significance conclusions under the Scoping Plan Update column indicate the greatest level of impacts (e.g., potentially significant and unavoidable) reported under the nine sectors, see Table 5-1 for more detailed information; [2] Significance conclusions under the MPO SCSs column indicate the greatest level of impacts (e.g., potentially significant and unavoidable) reported in an approved SCS EIR, see Table 5-3 for more detailed information;

Reasonably foreseeable compliance responses associated with the State SIP Strategy include construction and operation of new manufacturing facilities to support increased market penetration of PHEV, non-combustion ZEV including BEVs and hydrogen FCEV zero-emission technologies, electric-powered equipment (e.g., forklifts). There is uncertainty as to the specific location of new facilities or the modification of existing facilities. Construction and operation of these facilities could result in increased job opportunities in the communities surrounding a project site. In addition, increased low-emission diesel demand stimulated by implementation of a low-emission diesel standard is anticipated to increase cultivation or imports of low-emission diesel fuels or feedstocks. Increased low-emission diesel demand may increase processing of low-emission diesel fuels, and shipment of finished low-emission diesel fuels and/or their feedstocks. Infrastructure to support collection, processing, and distribution of low-emission diesel fuels, including biomethane, and associated feedstocks may also

increase. However, it would be expected that locations of these facilities would be selected such that an appropriate employment base existed to support construction and operation or where local jurisdictions have planned for increased population and employment growth.

Implementation of the Scoping Plan Update, LCFS/ADF regulations, and SCSs adopted by MPOs would include the reasonably foreseeable compliance responses described above under Section 5.D. As summarized in Table 5-17, the Scoping Plan Update EA and the LCFS/ADF regulation EA identified less-than-significant impacts on population and housing. SCSs associated with ABAG, Fresno COG, Kern COG, Madera CTC, San Joaquin COG, SCAG, and StanCOG would result in significant and unavoidable impacts to population and housing (Table 5-3). Thus, implementation of these programs could result in a significant cumulative effect.

The State SIP Strategy's contribution to this significant impact would not be cumulatively considerable because it would be expected that locations of new facilities would be selected such that an appropriate employment base existed to support construction and operation requirements, or in areas where local jurisdictions have planned for increased population and employment growth. As discussed in Chapter 4 of this ~~Draft~~ Final EA, short-term construction-related and long-term operation impacts on population and housing would be less-than-significant. Thus the State SIP Strategy **would not result in a cumulatively considerable contribution to a significant cumulative impact** on population and housing.

15. Public Services

Table 5-18
Summary of Public Services Impacts under Related Projects and State SIP Strategy

	Scoping Plan Update [1]	LCFS/ADF Regulation	MPO SCSs [2]	State SIP Strategy
Significance Conclusion	LTS	LTS	SU	LTS

Notes: LCSF/ADF=Low Carbon Fuel Standard/Alternative Diesel Fuels; MPO SCSs=Metropolitan Planning Organization Sustainable Community Strategies; SIP=State Implementation Plan; PSU=potentially significant and unavoidable: [1] Significance conclusions under the Scoping Plan Update column indicate the greatest level of impacts (e.g., potentially significant and unavoidable) reported under the nine sectors, see Table 5-1 for more detailed information; [2] Significance conclusions under the MPO SCSs column indicate the greatest level of impacts (e.g., potentially significant and unavoidable) reported in an approved SCS EIR, see Table 5-3 for more detailed information;

Reasonably foreseeable compliance responses associated with the State SIP Strategy include construction and operation of new manufacturing facilities to support increased

market penetration of PHEV, non-combustion ZEV including BEVs and hydrogen FCEV zero-emission technologies, electric-powered equipment (e.g., forklifts). There is uncertainty as to the specific location of new facilities or the modification of existing facilities. In addition, increased low-emission diesel demand stimulated by implementation of a low-emission diesel standard is anticipated to increase cultivation or imports of low-emission diesel fuels or feedstocks. Increased low-emission diesel demand may increase processing of low-emission diesel fuels, and shipment of finished low-emission diesel fuels and/or their feedstocks. Infrastructure to support collection, processing, and distribution of low-emission diesel fuels, including biomethane, and associated feedstocks may also increase. Construction and operation of the reasonably foreseeable compliance responses would not require a substantial amount of new additional housing to accommodate new populations or generate changes in land use and, therefore, would not be expected to increase population levels such that the provisions of public services would be substantially affected.

Implementation of the Scoping Plan Update, LCFS/ADF regulations, and SCSs adopted by MPOs would include the reasonably foreseeable compliance responses described above under Section 5.D. As summarized in Table 5-18, the Scoping Plan Update EA and the LCFS/ADF regulation EA identified less-than-significant impacts on public services. SCSs associated with ABAG, Fresno COG, Kern COG, Madera CTC, San Joaquin COG, and SCAG would result in significant and unavoidable impacts to public services (Table 5-3). Thus, implementation of these programs could result in a significant cumulative effect.

The State SIP Strategy's contribution to this significant impact would not be cumulatively considerable because population increases would be expected to be minimal and not substantially affect the provisions of public services. As discussed in Chapter 4 of this Draft Final EA, short-term construction-related and long-term operation impacts on public services would be less-than-significant. Thus the State SIP Strategy **would not result in a cumulatively considerable contribution to a significant cumulative impact** on public services.

16. Recreation

Table 5-19
Summary of Recreation Impacts under Related Projects and State SIP Strategy

	Scoping Plan Update [1]	LCFS/ADF Regulation	MPO SCSs [2]	State SIP Strategy
Significance Conclusion	PSU	PSU	SU	PSU

Notes: LCSF/ADF=Low Carbon Fuel Standard/Alternative Diesel Fuels; MPO SCSs=Metropolitan Planning Organization Sustainable Community Strategies; SIP=State Implementation Plan; PSU=potentially significant and unavoidable: [1] Significance conclusions under the Scoping Plan Update column indicate the greatest level of impacts (e.g., potentially significant and unavoidable) reported under the nine

sectors, see Table 5-1 for more detailed information; [2] Significance conclusions under the MPO SCSs column indicate the greatest level of impacts (e.g., potentially significant and unavoidable) reported in an approved SCS EIR, see Table 5-3 for more detailed information;

Reasonably foreseeable compliance responses associated with the State SIP Strategy include construction of new manufacturing facilities to support increased market penetration of PHEV, non-combustion ZEV including BEVs and hydrogen FCEV zero-emission technologies, and electric-powered equipment (e.g., forklifts). Increased use of near-zero and ~~near-zero~~ zero-emission technologies may result in increased infrastructure for natural gas and hydrogen refueling and charging stations, and increased demand for lithium battery manufacturing and associated increases in lithium mining and exports. New testing centers to monitor vehicle emissions may be constructed throughout the State. In addition, increased low-emission diesel demand stimulated by implementation of a low-emission diesel standard is anticipated to increase cultivation or imports of low-emission diesel fuels or feedstocks. Increased low-emission diesel demand may increase processing of low-emission diesel fuels, and shipment of finished low-emission diesel fuels and/or their feedstocks. Infrastructure to support collection, processing, and distribution of low-emission diesel fuels, including biomethane, and associated feedstocks may also increase. While implementation of State SIP Strategy would produce long-term employment, it would be anticipated that a sufficient employment base would be available. The minimal increase in employment opportunity would not create an increased demand on recreational facilities within communities containing new plants and facilities.

Implementation of the Scoping Plan Update, LCFS/ADF regulations, and SCSs adopted by MPOs would include the reasonably foreseeable compliance responses described above under Section 5.D. As summarized in Table 5-19, the Scoping Plan Update EA and the LCFS/ADF regulation EA identified less-than-significant impacts on recreation resources. SCSs associated with ABAG, Fresno COG, Kern COG, Madera CTC, San Joaquin COG, and SCAG would result in significant and unavoidable impacts to recreation resources (Table 5-3). Thus, implementation of these programs could result in a significant cumulative effect.

The State SIP Strategy's contribution to this significant impact would not be cumulatively considerable because population increases would be expected to be minimal and not substantially affect the use of, or demand for, recreational facilities. As discussed in Chapter 4 of this ~~Draft~~ Final EA, short-term construction-related and long-term operation impacts on recreation would be less-than-significant. Thus the State SIP Strategy **would not result in a cumulatively considerable contribution to a significant cumulative impact** on recreation.

17. Transportation and Traffic

Table 5-20
Summary of Transportation and Traffic Impacts under Related Projects and State SIP Strategy

	Scoping Plan Update [1]	LCFS/ADF Regulation	MPO SCSs [2]	State SIP Strategy
Significance Conclusion	PSU	PSU	SU	PSU

Notes: LCSF/ADF=Low Carbon Fuel Standard/Alternative Diesel Fuels; MPO SCSs=Metropolitan Planning Organization Sustainable Community Strategies; SIP=State Implementation Plan; PSU=potentially significant and unavoidable: [1] Significance conclusions under the Scoping Plan Update column indicate the greatest level of impacts (e.g., potentially significant and unavoidable) reported under the nine sectors, see Table 5-1 for more detailed information; [2] Significance conclusions under the MPO SCSs column indicate the greatest level of impacts (e.g., potentially significant and unavoidable) reported in an approved SCS EIR, see Table 5-3 for more detailed information;

Reasonably foreseeable compliance responses associated with the State SIP Strategy include construction and operation of new manufacturing facilities to support increased market penetration of PHEV, non-combustion ZEV including BEVs and hydrogen FCEV zero-emission technologies, electric-powered equipment (e.g., forklifts). There is uncertainty as to the specific location of new facilities or the modification of existing facilities. In addition, increased low-emission diesel demand stimulated by implementation of a low-emission diesel standard is anticipated to increase cultivation or imports of low-emission diesel fuels or feedstocks. Increased low-emission diesel demand may increase processing of low-emission diesel fuels, and shipment of finished low-emission diesel fuels and/or their feedstocks. Infrastructure to support collection, processing, and distribution of low-emission diesel fuels, including biomethane, and associated feedstocks may also increase. Depending on the amount of trip generation and the location of new facilities, implementation could conflict with applicable programs, plans, ordinances, or policies (e.g., performance standards, congestion management); and/or result in hazardous design features and emergency access issues from road closures, detours, and obstruction of emergency vehicle movement, especially due to project-generated heavy-duty truck trips.

Implementation of the Scoping Plan Update, LCFS/ADF regulations, and SCSs adopted by MPOs would include the reasonably foreseeable compliance responses described above under Section 5.D. As summarized in Table 5-20, the Scoping Plan Update EA and the LCFS/ADF regulation EA identified potentially significant and unavoidable impacts on traffic and transportation. SCSs associated with ABAG, BCAG, Fresno COG, Kern COG, Madera CTC, Merced CAG, SACOG, San Joaquin COG, SBCAG, SCAG, and SLOCOG would result in significant and unavoidable impacts to traffic and

transportation (Table 5-3). Thus, implementation of these programs could result in a significant cumulative effect.

The State SIP Strategy's contribution to this significant impact would be cumulatively considerable due to increased trip generation and resulting from construction and operation of new facilities. Implementation of the project-level mitigation identified in Chapter 4 could effectively reduce the incremental contribution from the State SIP Strategy to a less-than-considerable level, but authority to require that mitigation will rest with other agencies that will be authorizing site-specific projects, and not with ARB. Thus the State SIP Strategy could result in a **cumulatively considerable contribution to a significant cumulative impact** on traffic and transportation.

18. Utilities and Service System

Table 5-21
Summary of Utilities and Service System Impacts under Related Projects and State SIP Strategy

	Scoping Plan Update [1]	LCFS/ADF Regulation	MPO SCSs [2]	State SIP Strategy
Significance Conclusion	PSU	PSU	SU	PSU

Notes: LCSF/ADF=Low Carbon Fuel Standard/Alternative Diesel Fuels; MPO SCSs=Metropolitan Planning Organization Sustainable Community Strategies; SIP=State Implementation Plan; PSU=potentially significant and unavoidable: [1] Significance conclusions under the Scoping Plan Update column indicate the greatest level of impacts (e.g., potentially significant and unavoidable) reported under the nine sectors, see Table 5-1 for more detailed information; [2] Significance conclusions under the MPO SCSs column indicate the greatest level of impacts (e.g., potentially significant and unavoidable) reported in an approved SCS EIR, see Table 5-3 for more detailed information;

Reasonably foreseeable compliance responses associated with the State SIP Strategy include construction and operation of new manufacturing facilities to support increased market penetration of PHEV, non-combustion ZEV including BEVs and hydrogen FCEV zero-emission technologies, electric-powered equipment (e.g., forklifts). In addition, increased low-emission diesel demand stimulated by implementation of a low-emission diesel standard is anticipated to increase cultivation or imports of low-emission diesel fuels or feedstocks. Increased low-emission diesel demand may increase processing of low-emission diesel fuels, and shipment of finished low-emission diesel fuels and/or their feedstocks. Infrastructure to support collection, processing, and distribution of low-emission diesel fuels, including biomethane, and associated feedstocks may also increase. There is uncertainty as to the specific location of new facilities or the modification of existing facilities. Projects associated with the State SIP Strategy could result in new demand for water, wastewater, electricity, and gas services for new manufacturing facilities. Changes in land use, associated with biofuel feedstock

production are likely to change water demand to support new crop types, depending on the size, location, and existing uses. This could result in an increase or decrease in water demand, and would be subject to availability and regulatory requirements.

Implementation of the Scoping Plan Update, LCFS/ADF regulations, and SCSs adopted by MPOs would include the reasonably foreseeable compliance responses described above under Section 5.D. As summarized in Table 5-21, the Scoping Plan Update EA and the LCFS/ADF regulation EA identified potentially significant and unavoidable impacts on utilities and service systems. SCSs associated with ABAG, Fresno COG, Kern COG, Madera CTC, SACOG, San Joaquin COG, SCAG, and StanCOG would result in significant and unavoidable impacts to utilities and service systems (Table 5-3). Thus, implementation of these programs could result in a significant cumulative effect.

The State SIP Strategy's contribution to this significant impact would be cumulatively considerable because operation of new facilities could result in new demand for water, wastewater, electricity, and gas services. Implementation of the project-level mitigation identified in Chapter 4 could effectively reduce the incremental contribution from the State SIP Strategy to a less-than-considerable level, but authority to require that mitigation will rest with other agencies that will be authorizing site-specific projects, and not with ARB. Thus the State SIP Strategy could result in a **cumulatively considerable contribution to a significant cumulative impact** on utilities and service systems.

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6.0 MANDATORY FINDINGS OF SIGNIFICANCE

Consistent with the requirements of the CEQA Guidelines (Cal. Code Regs., tit. 14, § 15000 et seq) and section 18 of the Environmental Checklist (Appendix G of the CEQA Guidelines), this ~~Draft~~ Final EA addresses the mandatory findings of significance for the State SIP Strategy.

A. Mandatory Findings of Significance

1. Does the project have the potential to degrade the quality of the environment, substantially reduce the habitat for a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, reduce the number or restrict the range of a rare or endangered plant or animal, or eliminate important examples of the major periods of California history or prehistory?

A finding of significance is required if a project "has the potential to substantially degrade the quality of the environment (Cal. Code Regs., tit. 14, § 15065(a))." In practice, this is the same standard as a significant impact on the environment, which is defined as "a substantial or potentially substantial adverse change in any of the physical conditions within the area affected by the project including land, air, water, minerals, flora, fauna, ambient noise, and objects of historic or aesthetic significance (Cal. Code Regs., tit. 14, § 15065(a))."

As with all of the environmental impacts and issue areas, the precise nature, location and magnitude of impacts would be highly variable, and would depend on a range of reasonably foreseeable compliance responses that could occur with implementation of the State SIP Strategy. Location, extent, and a variety of other site-specific factors are not known at this time but would be addressed by environmental reviews to be conducted by local or regional agencies with regulatory authority at the project-specific level.

This ~~Draft~~ Final EA, in its entirety, addresses and discloses potential environmental impacts associated with the recommended actions with the proposed regulations, including direct, indirect, and cumulative impacts in the following resource areas:

- Aesthetics
- Agriculture and Forest Resources
- Air Quality
- Biological Resources
- Cultural Resources
- Energy Demand
- Geology and Soils
- Greenhouse Gases

- Hazards and Hazardous Materials
- Hydrology and Water Quality
- Land Use and Planning
- Mineral Resources
- Noise
- Population and Housing
- Public Services
- Recreation
- Transportation/Traffic
- Utilities and Service Systems

As described in Chapter 4, this ~~Draft~~ Final EA discloses potential environmental impacts, the level of significance prior to mitigation, proposed mitigation measures, and the level of significance after the incorporation of mitigation measures.

a) Impacts on Species

A lead agency shall find that a project may have a significant impact on the environment where there is substantial evidence that the project has the potential to (1) substantially reduce the habitat of a fish or wildlife species; (2) cause a fish or wildlife population to drop below self-sustaining levels; or (3) substantially reduce the number or restrict the range of an endangered, rare, or threatened species (Cal. Code Regs., tit. 14, § 15065(a)(1)). Chapter 4 of this ~~Draft~~ Final EA addresses impacts that could occur to biological resources, including the reduction of fish or wildlife habitat, the reduction of fish or wildlife populations, and the reduction or restriction of the range of special-status species. These impacts could be reduced to a less-than-significant level upon implementation of mitigation measures. Consequently, while impacts could be reduced to a less-than-significant level by land use and/or permitting agency conditions of approval, this ~~Draft~~ Final EA takes the conservative approach in its post-mitigation significance conclusion and discloses, for CEQA compliance purposes, that impacts to species associated with the State SIP Strategy would be **potentially significant and unavoidable**.

b) Impacts on Historical Resources

A lead agency shall find that a project may have a significant impact on the environment where there is substantial evidence that the project has the potential to eliminate important examples of a major period of California history or prehistory (Cal. Code Regs., tit. 14, § 15065(a)(1)). This guidance amplifies PRC section 21001(c) requiring that major periods of California history are preserved for future generations. It also reflects the provisions of PRC section 21084.1 requiring a finding of significance for substantial adverse changes to historical resources. The CEQA Guidelines establishes standards for determining the significance of impacts to historical resources and archaeological sites that are a historical resource (Cal. Code Regs., tit. 14, § 15064.5). Chapter 4 of this ~~Draft~~ Final EA addresses impacts that could occur related to California

history and prehistory, historic resources, archaeological resources, and paleontological resources. These impacts could be reduced to a less-than-significant level upon implementation of mitigation measures. Consequently, while impacts could be reduced to a less-than-significant level by land use and/or permitting agency conditions of approval, this ~~Draft~~ Final EA takes the conservative approach in its post-mitigation significance conclusion and discloses, for CEQA compliance purposes, that impacts to historical resources associated with the State SIP Strategy would be **potentially significant and unavoidable**.

2. Does the project have impacts that are individually limited, but cumulatively considerable?

A lead agency shall find that a project may have a significant impact on the environment where there is substantial evidence that the project has potential environmental impacts that are individually limited, but cumulatively considerable (Cal. Code Regs., tit. 14, § 15065). Cumulatively considerable means "that the incremental effects of an individual project are significant when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects(Cal. Code Regs., tit. 14, § 15065(a)(3))." Cumulative impacts are addressed for each of the environmental topics listed above and are provided in Chapter 5, "Cumulative and Growth-Inducing Impacts," in this ~~Draft~~ Final EA.

3. Does the project have environmental effects that will cause substantial adverse effects on human beings, either directly or indirectly?

A lead agency shall find that a project may have a significant impact on the environment where there is substantial evidence that the project has the potential to cause substantial adverse impacts on human beings, either directly or indirectly (Cal. Code Regs., tit. 14, § 15065(a)(4)). Under this standard, a change to the physical environment that might otherwise be minor must be treated as significant if people would be significantly affected. This factor relates to adverse changes to the environment of human beings generally, and not to impacts on particular individuals. While changes to the environment that could indirectly affect human beings would be represented by all of the designated CEQA issue areas, those that could directly affect human beings include air quality, geology and soils, hazards and hazardous materials, hydrology and water quality, noise, transportation/traffic, and utilities, which are addressed in Chapter 4 of this ~~Draft~~ Final EA. These impacts could be reduced to a less-than-significant level upon implementation of mitigation measures. Consequently, while impacts could be reduced to a less-than-significant level by land use and/or permitting agency conditions of approval, this ~~Draft~~ Final EA takes the conservative approach in its post-mitigation significance conclusion and discloses, for CEQA compliance purposes, that impacts on human beings associated with the State SIP Strategy would be **potentially significant and unavoidable**.

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7.0 ALTERNATIVES ANALYSIS

The following discussion provides an overview of the steps taken to develop alternatives to the proposed action (i.e., adoption of the State SIP Strategy), the project objectives associated with the proposed action, and an analysis of the alternatives' environmental effects and ability to meet the project objectives. This section satisfies CEQA requirements related to alternatives to the proposed project (Cal. Code Regs., tit. 14, § 126.6).

A. Approach to Alternatives Analysis

ARB's certified regulatory program (Cal. Code Regs., tit. 17 § 60000-60008) requires that where a contemplated action may have a significant effect on the environment, a document shall be prepared in a manner consistent with the environmental protection purposes of ARB's program and with the goals and policies of CEQA. Among other things, the document must address feasible alternatives to the proposed action that would substantially reduce any significant adverse impact identified.

The certified regulatory program provides general guidance that any action or proposal for which significant adverse environmental impacts have been identified during the review process shall not be approved or adopted as proposed if there are feasible mitigation measures or feasible alternatives available that would substantially reduce such adverse impacts. For purposes of this section, "feasible" means capable of being accomplished in a successful manner within a reasonable period of time, taking into account economic, environmental, social, and technological factors, and consistent with the Board's legislatively mandated responsibilities and duties (Cal. Code Regs., tit. 17 § 60006).

While ARB, by virtue of its certified program, is exempt from Chapters 3 and 4 of CEQA and corresponding sections of the CEQA Guidelines (Cal. Code Regs., tit. 14, § 15000 et. seq.), the Guidelines nevertheless provide useful information for preparation of a thorough and meaningful alternatives analysis. CEQA Guidelines speak to evaluation of "a range of reasonable alternatives to the project, or the location of the project, which would feasibly attain most of the basic project objectives but would avoid or substantially lessen any of the significant effects, and evaluate the comparative merits of the alternatives (Cal. Code Regs., tit. 14, § 15126(a))." The purpose of the alternatives analysis is to determine whether or not different approaches to or variations of the project would reduce or eliminate significant project impacts, within the basic framework of the objectives, a principle that is consistent with ARB's program requirements.

The range of alternatives is governed by the "rule of reason," which requires evaluation of only those alternatives "necessary to permit a reasoned choice" (Cal. Code Regs., tit. 14 § 15126.6 (f)). Further, an agency "need not consider an alternative whose effect cannot be reasonably ascertained and whose implementation is remote and

speculative" (Cal. Code Regs., tit. 14 §15126.6 (f)(3)). The analysis should focus on alternatives that are feasible and that take economic, environmental, social, and technological factors into account. Alternatives that are remote or speculative need not be discussed. Furthermore, the alternatives analyzed for a project should focus on reducing or avoiding significant environmental impacts associated with the project as proposed.

B. Project Objectives

The objectives of the State SIP Strategy Measures are to:

1. Provide the necessary emission reductions for all of California's nonattainment areas to meet federal ambient air quality standards by the attainment dates specified by U.S. EPA, including the 75 ppb ground level ozone standard and the annual PM2.5 standard of 12 $\mu g/m^3$;

2. Support the development and submittal of an approvable SIP to U.S. EPA. To meet U.S. EPA requirements for approvable SIPs, the measures must include commitments to achieve emission reductions that are real, permanent, quantifiable, verifiable, and enforceable;

3. Complement existing programs and plans – to ensure, to the extent feasible, that activities undertaken pursuant to the measures complement, and do not interfere with, existing planning efforts to reduce GHG emissions, use of petroleum-based transportation fuels, and TAC emissions;

4. Incentivize and support emerging technology that will be needed to achieve ARB's SIP goals;

5. Establish requirements for cleaner technologies (both near-zero and ~~near-zero~~ zero-emission technologies), coupled with cleaner renewable fuels to achieve ARB's SIP goals;

6. Introduce zero-emission technology in targeted applications to achieve ARB's SIP goals;

7. Ensure the in-use vehicle and engine fleets remain durable, and that in use vehicles continue to operate at their cleanest possible level to achieve ARB's SIP goals; and

8. Incentivize early introduction of advanced clean technologies to achieve ARB's SIP goals.

C. Description of Alternatives

Detailed descriptions of each alternative are presented below. The analysis that follows the descriptions of the alternatives includes a discussion of the degree to which each alternative meets the basic project objectives, and the degree to which each alternative avoids potentially significant impacts identified in Chapter 4.

1. Alternative 1: No-Project Alternative

a) Alternative 1 Description

ARB is including Alternative 1, the No-Project Alternative, to provide a good faith effort to disclose environmental information that is important for considering the State SIP Strategy. ARB's certified regulatory program does not mandate consideration of a "No-Project Alternative." (Cal. Code Regs., tit. 17, § 60006.) Under ARB's certified program, the alternatives considered, among other things, must be "consistent with the state board's legislatively mandated responsibilities and duties." (Cal. Code Regs., tit. 17, § 60006.)

Under the No-Project Alternative, the State SIP Strategy would not be adopted. ARB's existing control program, which is comprised of regulations and programs the Board has already adopted, would continue to be implemented. For a list of these programs, please refer to Attachment 1.

As the No-Project Alternative precludes the State from submitting to U.S. EPA an approvable SIP, adoption of this alternative would result in a failure to meet statutory requirements under the Act and State law. If it is found that a SIP has failed to meet certain requirements under the Act (§ 179(b); 42 U.S.C. § 7509(a)), consequences could include:

- Offset sanctions (the Act § 179(b); 42 U.S.C. § 7509(b))
- Highway funding sanctions (the Act § 179(b); 42 U.S.C. § 7509(b))
- Issuance and enforcement of a Federal Implementation Plan (FIP), prepared by U.S. EPA (the Act § 110(c); 42 U.S.C. § 7410(c)).

If a state fails to adopt and implement an adequate plan, U.S. EPA may issue and enforce a FIP, pursuant to Section 110(c) of the Act, which is designed to correct any deficiencies in the SIP. Requirements under a FIP would be prepared under the discretion of U.S. EPA. Similarly to a SIP, a FIP would be developed considering competing and interrelated economic, political, and environmental factors that could result in widely varying elements. Moreover, in the past, U.S. EPA has primarily worked with states to develop their own implementation plans, rather than imposing sanctions and federal plans. As a result, beyond the basic limitation that a FIP only corrects the inadequacies in a SIP, it is not possible to determine the content of a hypothetical FIP or its potential environmental impacts.

b) Alternative 1 Discussion

i) Objectives

The No-Project Alternative would fail to meet many of the project objectives listed in Chapter 2 and reiterated above. The No-Project Alternative fails to provide the necessary emission reductions for all of California's nonattainment areas to meet federal air quality standards, and would thus not allow for submittal of an approvable SIP to U.S. EPA (Objectives 1 and 2). Furthermore, the No-Project Alternative is also inconsistent with Objectives 4 through 8, which encourage an increased rate of market penetration of near-zero and ~~near-zero~~ zero-emission technology. Thus, this alternative would not feasibly meet most of the objectives of the State SIP Strategy.

ii) Environmental Impacts

As described above, past practice gives little guidance to make it possible to determine the likely scope, timing, and content of the provisions of a FIP for California. As the specific control programs and requirements of the FIP would be prepared at the discretion of U.S. EPA, it is not possible to determine the scope and content of actions that could result from the No-Project Alternative. Thus, an evaluation of the environmental effects under the No-Project Alternative is not feasible

2. Alternative 2: No Low-Emission Diesel Alternative

a) Alternative 2 Description

Alternative 2 would entail the same regulatory and programmatic actions as the State SIP Strategy, except that it would not include requirements for low-emission diesel fuels. Alternative 2 would include the State SIP Strategy measures described in Chapter 2 for on-road LDVs, on-road HDVs, off-road federal and international sources, off-road equipment sources, and consumer products.

Generally, compliance responses associated with Alternative 2 would reflect those associated with the State SIP Strategy, including construction and operation of new manufacturing facilities to support increased market penetration of PHEVs and ZEVs, including BEVs and hydrogen FCEVs. New testing centers to monitor vehicle emissions may be constructed throughout the State.

b) Alternative 2 Discussion

i) Objectives

Alternative 2 foregoes the emission reduction benefits associated with the low-emission diesel measure. Without these reductions, the State may not be able to achieve the necessary emissions reductions to attain federal air quality standards in all non-attainment areas, indicating that this alternative is not consistent with Objectives 1

through 4. This alternative is consistent with Objective 5, which is related to increased market penetration of near-zero and ~~near-zero~~ zero-emission-technologies. By excluding the renewable fuel component of the State SIP Strategy, however, this alternative is inconsistent with Objectives 6 – 8, which relate to increased use of renewable fuels and incentivizing the introduction of advanced clean technologies to ensure the engines and vehicles on the road are operating at their cleanest possible level. Overall, this alternative is less effective at achieving the project objectives compared to the State SIP Strategy. Without low-emission diesel fuel requirements, long-term goals related to air emission reductions would not be met. Thus, this alternative may not feasibly meet objectives related to the purpose and need of the State SIP Strategy.

ii) Environmental Impacts

As described above, Alternative 2 would eliminate the reasonably foreseeable compliance responses associated with the Low-Emission Diesel measure, including the increased production, processing, and transportation of low-emission diesel feedstocks and finished fuels, and increased infrastructure to support collection, processing, and distribution of low-emission diesel fuels and feedstocks.

Compared to the State SIP Strategy, Alternative 2 is anticipated to result in reduced demand for low-emission diesel feedstocks and fuels such as renewable diesel and biomethane. As a result, this alternative is less likely to result in increased demand for feedstocks such as soybeans, corn oil, used cooking oil, and/or animal tallow than the State SIP Strategy. This alternative would reduce potentially significant impacts associated with agricultural and forestry resources, land use, biological resources, and transportation associated with low-emission diesel fuels. Without the need for new infrastructure to support collection, processing, and distribution of low-emission diesel fuels and feedstocks, construction-related impacts would be reduced, which would include impacts related to aesthetics, agricultural and forest resources, air quality, biological resources, cultural resources, geology and soils, hazards and hazardous materials, hydrology and water quality, land use and planning, noise, transportation, and utilities and service systems, as described in Chapter 4.

3. Alternative 3: Regulatory Measures Only

a) Alternative 3 Description

Alternative 3 would contain only the regulatory components of the State SIP Strategy, including ARB and U.S. EPA regulatory actions, without the incentive-based measures. State SIP measures that would be included in Alternative 3 include:

- Advanced Clean Cars 2
- Lower In-Use Emission Performance Level for On-Road HDVs
- Low-NOx Engine Standard – California Action

- Low-NOx Engine Standard – Federal Action
- Heavy-Duty GHG Phase 2
- Innovative Clean Transit
- Last Mile Delivery
- Innovative Technology Certification Flexibility
- Zero-Emissions Airport Shuttle Buses
- More Stringent National Locomotive Emission Standards
- At-Berth Regulation Amendment (regulatory components only)
- Zero-Emission Off-Road Forklift Regulation Phase 1
- Zero-Emission Airport GSE (regulatory components only)
- Small Off-Road Engines (regulatory components only)
- TRUs Used for Cold Storage (regulatory components only)
- Low-Emission Diesel Requirement
- Consumer Products Program

Alternative 3 would result in the same types of compliance responses as the State SIP Strategy, albeit to a lesser extent. For example, incentives would not be provided to increased ZEV deployment beyond penetration rates associated with the regulations. Similar to the proposed project, reasonably foreseeable compliance responses associated with Alternative 3 include: increased infrastructure for hydrogen refueling and charging; increased demand for lithium battery manufacturing and associated increases in lithium mining and exports; increased recycling or refurbishment of lithium batteries; and increased emission testing of vehicles. As with the State SIP Strategy, the replacement rate of vehicles and engines would be increased beyond baseline levels, resulting in the recycling or sale of older models outside of California. Compliance responses could also include construction and operation of new manufacturing facilities to support zero-emission technologies and testing centers to monitor vehicle emissions. In addition, increased low-emission diesel demand stimulated by implementation of a low-emission diesel standard is anticipated to increase cultivation or imports of low-emission diesel fuels or feedstocks. Increased low-emission diesel demand may increase processing of low-emission diesel fuels, and shipment of finished low-emission diesel fuels and/or their feedstocks. Infrastructure to support collection, processing, and distribution of low-emission diesel fuels, including biomethane, and associated feedstocks may also increase. Finally, infrastructure to support collection, processing, and distribution of biomethane may be required.

b) Alternative 3 Discussion

i) Objectives

By excluding incentive-based components of the State SIP Strategy, the market penetration of near-zero and ~~near-zero~~ zero-emission technologies would occur to a reduced extent under this alternative, as incentives often play a critical role in early penetration rates of advanced technologies. With delayed penetration of these needed

nonattainment areas is not considered feasible. Thus, this alternative is not considered to be feasible and is not considered further.

2. Earlier Attainment Scenario Alternative

The Earlier Attainment Scenario Alternative would be the same as the State SIP Strategy, except that the deadline for implementation would be moved to 2026. The year 2026 is the year in which the most severe area of the State must implement actions under the SIP. However, the compliance responses that are expected to occur under the State SIP Strategy cannot be met under this timeline by 2026, as construction requirements and other technological improvements could not feasibly be implemented in this period of time. Furthermore, this alternative would not reduce any of the environmental impacts compared to the State SIP Strategy. Thus, this alternative is not considered to be feasible and is not considered further.

8.0 REFERENCES

1. Association of Monterey Bay Area Governments (AMBAG). 2010. 2035 Metropolitan Transportation Plan and SCS Supplemental EIR. Available: http://ambag.org/programs/met_transp_plann/documents/Draft_2035_EIR/AMBAG%20MTP-SCS%20and%20RTPs%20DEIR%20with%20Appendices.pdf. Accessed: February 2016.

2. Association of Bay Area Governments (ABAG). 2013. Plan Bay Area. Environmental Impact Report. Available: http://planbayarea.org/plan-bay-area/plan-elements/environmental-impact-report.html. Accessed: February 2016.

3. Bertzky, Monika, Valerie Kapos, and Jorn P. W. Scharlemann. 2011 (August). Indirect Land Use Change from biofuel production: implications for biodiversity. Available: http://www.cbd.int/agriculture/2011-121/UNEP-WCMC-JNCC%20report-sep11-en.pdf. Accessed: December 2014.

4. Butte County Association of Governments Metropolitan Transportation Plan (BCAG 2012). Available: http://www.bcag.org/Planning/RTP--SCS/2012-MTPSCS-EIR/. Accessed: February 2016.

5. California Air Resources Board (ARB). 2014. Final Environmental Analysis for the First Update to the Climate Change Scoping Plan. Available: http://www.arb.ca.gov/cc/scopingplan/2013_update/appendix_f_final_ea.pdf. Accessed: February 2016.

6. California Air Resources Board (ARB). 2015. Drive Clean. Hydrogen Fuel Cells. Available:http://www.driveclean.ca.gov/Search_and_Explore/Technologies_and_Fuel_Types/Hydrogen_Fuel_Cell.php. Accessed: December 2015.

7. Edmunds. 2014.What Happens to EV and Hybrid Batteries? Available: http://www.edmunds.com/fuel-economy/what-happens-to-ev-and-hybrid-batteries.html. Accessed: December 2015.

8. Fresno Council of Governments (Fresnocog). 2014. 2014 Regional Transportation Plan Regional Transportation Plan/Sustainable Communities Strategy Program EIR. Available: http://www.fresnocog.org/rtp. Accessed: February 2016.

9. Gruber, Paul W., Pablo A. Medina, Gregory A. Keoleian, Stephen E. Kesler, Mark P. Everson and Timothy J. Wallington. 2011. Global Lithium Availability. A Constraint for Electric Vehicles? Journal of Industrial Ecology. Volume 15, Issue 5, pages 760-775, October 2011.

10. Kern Council of Governments. 2014. 2014 Regional Transportation Plan Regional Transportation Plan/Sustainable Communities Strategy Program EIR. Available: http://www.kerncog.org/images/docs/rtp/2014/draft_2014_RTP_EIR.pdf. Accessed: February 2016.

11. Kings County Association of Governments. 2014. 2014 Regional Transportation Plan Regional Transportation Plan/Sustainable Communities Strategy Program EIR. Available: http://www.kingscog.org/assets/KCAG%202014%20RTP-SCS%20Final%20PEIR.pdf. Accessed: February 2016.

12. Madera County Transportation Commission. 2014. 2014 Regional Transportation Plan and Sustainable Communities Strategy Draft Supplemental EIR. Available: http://www.maderactc.org/wp-content/uploads/2013/04/MCTC-2014-RTP-SCS-Draft-PEIR.pdf. Accessed: April 2016.

13. Merced County Association of Governments. 2014a. 2014 Regional Transportation Plan and Sustainable Communities Strategy Initial Study. Available: http://www.mcagov.org/DocumentCenter/View/193. Accessed: April 2016.

14. Merced County Association of Governments. 2014b. Merced County 2014 Regional Transportation Plan. Available: http://www.mcagov.org/DocumentCenter/View/284. Accessed: April 2016.

15. National Renewable Energy Laboratory. 2011. Available: The Impact of Lithium Availability on Vehicle Electrification. Available: http://www.nrel.gov/transportation/energystorage/pdfs/52393.pdf. Accessed: December 2015

16. Pipeline and Hazardous Materials Safety Administration. 2014. Hazards Materials: Revisions to Requirements for the Transportation of Lithium Batteries. Available: https://www.federalregister.gov/articles/2014/08/06/2014-18146/hazardous-materials-transportation-of-lithium-batteries. Accessed: December 2015.

17. Sacramento Area Council of Governments (SACOG). 2015. Draft EIR for the Metropolitan Transportation Plan/Sustainable Communities Strategy. Executive Summary. Available: http://www.sacog.org/sites/main/files/file-attachments/0_executive_summary.pdf. Accessed: April 2016.

18. Shasta Regional Transportation Agency (SRTA). 2015 RTP Draft EIR. Available: http://www.srta.ca.gov/142/Regional-Transportation-Plan. Accessed: February 2016.

19. San Joaquin Council of Governments. 2014. 2014-2040 RTP and SCS Program EIR. Available: http://www.sjcog.org/index.aspx?NID=222. Accessed: February 2016.

20. San Luis Obispo Council of Governments (SLOCOG). 2014. 2010 Regional Transportation Plan Regional Transportation Plan/Sustainable Communities Strategy and 2014 Addendum. Available: http://www.slocog.org/programs/regional-planning/2014-rtpscs. Accessed: February 2016.

21. Stanislaus Council of Governments. 2014. 2014 Regional Transportation Plan Regional Transportation Plan/Sustainable Communities Strategy EIR. Available: http://www.stancog.org/pdf/rtp/final-2014-rtpscs.pdf. Accessed: February 2016.

22. Santa Barbara County Association of Governments (SBCAG). 2013. 2040 RTP and SCS EIR. Available: http://www.sbcag.org/uploads/2/4/5/4/24540302/finaleir_2040rtp-scs.pdf. Accessed: February 2016.

23. Society of Automotive Engineers. 2013. Standard for Fuel Systems in Fuel Cell and Other Hydrogen Vehicles. Available: http://standards.sae.org/j2579_201303. Accessed: December 2015.

24. Society of Vertebrate Paleontology (SVP). 2010. Standard Procedures for the Assessment and Mitigation of Adverse Impacts to Nonrenewable Paleontological Resources. Electronic document, http://www.vertpaleo.org/StatementsandGuidelines/2021.htm. Accessed December 2014.

25. Southern California Association of Governments (SCAG). 2012. 2012-2035 Regional Transportation Plan/Sustainable Communities Strategy Program EIR. Available: http://rtpscs.scag.ca.gov/Pages/default.aspx. Accessed: February 2016.

26. Tahoe Metropolitan Planning Organization and Tahoe Regional Planning (TRPA and TMPO). 2012. Tahoe Metropolitan Planning Organization and Tahoe Regional Planning Agency Mobility 2035 EIR/EIS. Available: http://tahoempo.org/Mobility2035/. Accessed: February 2016.

27. Tulare County Association of Governments (Tularecog). 2014. 2014-2040 RTP/SCS. Available: http://www.tularecog.org/wp-content/uploads/2015/06/Regional-Transportation-Plan-RTP-Sustainable-Communities-Strategy-SCS-Environmental-Impact-Report-Draft-ADEIR-with-Appendices.pdf. Accessed: February 2016.

28. U.S. Environmental Protection Agency. 1994. Technical Resource Document, Extraction and Beneficiation of Ores and Minerals, Volume 4. Cooper. U.S. Environmental Protection Agency Office of Solid Waste. Washington, D.C.

29. United State Geological Survey. 2015. Lithium. Available: http://minerals.usgs.gov/minerals/pubs/commodity/lithium/mcs-2015-lithi.pdf. Accessed: December 2015.

ATTACHMENT 1: ENVIRONMENTAL AND REGULATORY SETTING

1. AESTHETICS

A. Existing Conditions

The visual character of California varies greatly related to topography and climate. The foothills form a transitional landform from the valley floor to the higher Sierra Nevada, Cascade, and Coast Ranges. The valley floor is cut by two rivers that flow west out of the Sierra Nevada and east out of the Coast Ranges. Irrigated agriculture land is the primary landscape in the Sacramento and San Joaquin Valleys, and the foothill landscape has been altered by grazing, mining, reservoir development, and residential and commercial development. The visual character of the state also varies dramatically from the north, which is dominated by forest lands, and the south, which is primarily residential and commercial development.

B. Regulatory Setting

Applicable laws and regulations associated with aesthetics and scenic resources are discussed in Table 1.

Table 1: Applicable Laws and Regulations for Aesthetic Resources

Applicable Regulations	Description
Federal	
Federal Land Policy and Management Act of 1976 (FLPMA)	FLPMA is the enabling legislation establishing the Bureau of Land Management's (BLM's) responsibilities for lands under its jurisdiction. Section 102 (a) of the FLPMA states that "…the public lands be managed in a manner that will protect the quality of scientific, scenic, historical, ecological, environmental, air and atmospheric, water resources, and archeological values…" Section 103(c) identifies "scenic values" as one of the resources for which public land should be managed.
BLM Contrast Rating System	The contrast rating system is a systematic process used by BLM to analyze visual impacts of proposed projects and activities. It is primarily intended to assist BLM personnel in the resolution of visual impact assessment.
Natural Historic Preservation Act (NHPA)	Under regulations of the NHPA, visual impacts to a listed or eligible National Register property that may diminish the integrity of the property's "setting … [or] … feeling" in a way that affects the property's eligibility for listing may result in a potentially significant adverse effect. "Examples of adverse effects … include…: Introduction of visual, atmospheric, or audible elements that diminish the integrity of the property's significant historic features." (Title 36 Code of Federal Regulations CFR (CFR) Part

Table 1: Applicable Laws and Regulations for Aesthetic Resources	
Applicable Regulations	**Description**
	800.5)
National Scenic Byways Program	Title 23, Sec 162 outlines the National Scenic Byways Program. This program is used to recognize roads having outstanding scenic, historic, cultural, natural, recreational, and archaeological qualities through designation of road as: National Scenic Byways; All-American Roads; or America's Byways. Designation of the byways provides eligibility for Federal assistance for safety improvement, corridor management plans, recreation access, or other project that protect scenic, historical, recreational, cultural, natural, and archaeological resources.
State	
Ambient Air Quality Standard for Visibility-Reducing Particles	Extinction coefficient (measure of absorption of light in a medium) of 0.23 per kilometer — visibility of 10 miles or more (0.07 — 30 miles or more for Lake Tahoe) due to particles when relative humidity is less than 70 percent.
California Streets and Highway Code, Section 260 through 263 – Scenic Highways	The State Scenic Highway Program promotes protection of designated State scenic highways through certification and adoption of local scenic corridor protection programs that conform to requirements of the California Scenic Highway Program.
Local	
County and City Controls	Most local planning guidelines to preserve and enhance the visual quality and aesthetic resources of urban and natural areas are established in the jurisdiction's general plan. The value attributed to a visual resource generally is based on the characteristics and distinctiveness of the resource and the number of persons who view it. Vistas of undisturbed natural areas, unique or unusual features forming an important or dominant portion of a viewshed, and distant vistas offering relief from less attractive nearby features are frequently considered to be scenic resources. In some instances, a case-by-case determination of scenic value may be needed, but often there is agreement within the relevant community about which features are valued as scenic resources. In addition to federal and State designations, counties and cities have their own scenic highway designations, which are intended to preserve and enhance existing scenic resources. Criteria for designation are commonly included in the conservation/open space element of the city or county general plan.

2. AGRICULTURAL AND FOREST RESOURCES

A. Existing Conditions

1. Agricultural Resources

The State of California maps and classifies farmland through the California Department of Conservation Farmland Mapping and Monitoring Program (FMMP). Classifications are based on a combination of physical and chemical characteristics of the soil and climate that determine the degree of suitability of the land for crop production. The classifications under the FMMP are as follows:

- Prime Farmland—land that has the best combination of features for the production of agricultural crops;
- Farmland of Statewide Importance—land other than Prime Farmland that has a good combination of physical and chemical features for the production of agricultural crops, but that has more limitations than Prime Farmland, such as greater slopes or less ability to store soil moisture;
- Unique Farmland—land of lesser quality soils used for the production of the state's leading agricultural cash crops;
- Farmland of Local Importance—land of importance to the local agricultural economy;
- Grazing Land—existing vegetation that is suitable for grazing;
- Urban and Built-Up Land—land occupied by structures in density of at least one dwelling unit per 1.5 acres;
- Land Committed to Nonagricultural Use—vacant areas; existing land that has a permanent commitment to development but has an existing land use of agricultural or grazing lands; and
- Other Land— land not included in any other mapping category, common examples of which include low-density rural developments, brush, timber, wetland, and vacant and nonagricultural land surrounded on all sides by urban development.

CEQA Section 21095 and CEQA Guidelines Appendix G, together, define Prime, Unique, and Farmland of Statewide Importance as "Important Farmland," whose conversion may be considered significant. Local jurisdictions can further consider other classifications of farmland as important, and can also utilize an agricultural land evaluation and site assessment (LESA) model to determine farmland importance and impacts from conversion.

As of 2012, California contained 41,570 acres of Prime Farmland; 33,337 acres of Farmland of Statewide Important; 28,725 acres of Unique Farmland; 15,168 acres of Farmland of Local Importance; and 197,866 acres of grazing land (FMMP 2012).

Williamson Act

The California Land Conservation Act of 1965--commonly referred to as the Williamson Act--enables local governments to enter into contracts with private landowners for the purpose of restricting specific parcels of land to agricultural or related open space use. In return, landowners receive property tax assessments which are much lower than normal because they are based upon farming and open space uses as opposed to full market value. The Open Space Subvention Act of 1971 provided local governments an annual subvention of forgone property tax revenues from the state through the year 2009; these payments have been suspended in more recent years due to revenue shortfalls.

Of California's 58 counties, 52 have executed contracts under the Land Conservation Act Program. The 15.4 million acres reported as enrolled in Land Conservation Act contracts statewide in 2013, represents approximately 50 percent of California's farmland total of about 30 million acres, or about 31 percent of the State's privately owned land (California Department of Conservation 2015).

2. Forestry Resources

Forestland is defined as land that can support 10 percent native tree cover of any species, including hardwoods, under natural conditions, and that allows for management of one or more forest resources, including timber, aesthetics, fish and wildlife, biodiversity, water quality, recreation, and other public benefits (Public Resources Code [PRC] 12220[g]). There are 40,233,000 acres of forested land within California including oak woodlands and conifer forests (CDFW 2014a).

Timberland is privately-owned land, or land acquired for state forest purposes, which is devoted to and used for growing and harvesting timber, or for growing and harvesting timber and compatible uses, of, at minimum 15 cubic feet per acre (PRC 51104[g]). Forest managed for harvest is called timberland, and includes 2,932,000 acres in private ownership, 146,000 acres in State ownership, 10,130,000 acres in federal ownership, and 4,551,000 acres of non-industrial timberland in private ownership (CDFW 2014a).

B. Regulatory Setting

Table 2 below provides a general description of applicable laws and regulations that may pertain to agriculture and forest resources.

Table 2: Applicable Laws and Regulations for Agriculture and Forest Resources	
Applicable Regulations	**Description**

Table 2: Applicable Laws and Regulations for Agriculture and Forest Resources	
Applicable Regulations	**Description**
Federal	
Farmland Protection Policy Act (FPPA)	FPPA directs federal agencies to consider the effects of federal programs or activities on farmland, and ensure that such programs, to the extent practicable, are compatible with state, local, and private farmland protection programs and policies. The rating process established under the FPPA was developed to help assess options for land use on an evaluation of productivity weighed against commitment to urban development.
National Forest Management Act (NFMA) of 1976	NFMA is the primary statute governing the administration of national forests. The act requires the Secretary of Agriculture to assess forest lands, develop a management program based on multiple-use, sustained-yield principles, and implement a resource management plan for each unit of the National Forest System. Goal 4 of the U.S. Forest Service's National Strategic Plan for the National Forests states that the nation's forests and grasslands play a significant role in meeting America's need for producing and transmitting energy. Unless otherwise restricted, National Forest Service lands are available for energy exploration, development, and infrastructure (e.g., well sites, pipelines, and transmission lines). However, the emphasis on non-recreational special uses, such as utility corridors, is to authorize the special uses only when they cannot be reasonably accommodated on non-National Forest Service lands.
State	
The California Land Conservation Act, also known as the Williamson Act (Government Code Section 51200)	The California Department of Conservation's (DOC's) Division of Land Resource Protection administers the Williamson Act program, which permits property tax adjustments for landowners who contract with a city or county to keep their land in agricultural production or approved open space uses for at least 10 years. Lands covered by Williamson Act contracts are assessed on the basis of their agricultural value instead of their potential market value under nonagricultural uses. In return for the preferential tax rate, the landowner is required to contractually agree to not develop the land for a period of at least 10 years. Williamson Act contracts are renewed annually for 10 years unless a party to the contract files for nonrenewal. The filing of a non-renewal application by a landowner ends the automatic annual extension of a contract and starts a 9-year phase-out of the contract. During the phase-out period, the land remains restricted to agricultural and open-space uses, but property taxes gradually return to levels associated with the

Table 2: Applicable Laws and Regulations for Agriculture and Forest Resources	
Applicable Regulations	**Description**
	market value of the land. At the end of the 9-year non-renewal process, the contract expires and the owner's uses of the land are restricted only by applicable local zoning. The Williamson Act defines compatible use of contracted lands as any use determined by the county or city administering the agricultural preserve to be compatible with the agricultural, recreational, or open space use of land within the preserve and subject to contract (Government Code, Section 51202[e]). However, uses deemed compatible by a county or city government must be consistent with the principles of compatibility set forth in Government Code, Section 51238.1. Approximately 16 million acres of farmland (about 50 percent of the State's total farmland) are enrolled in the program.
California Farmland Conservancy Program (CFCP) (Public Resources Code [PRC] Section 10200)	The program provides grant funding for agricultural conservation easements. Although the easements are always written to reflect the benefits of multiple resource values, there is a provision in the CFCP statute that prevents easements funded under the program from restricting husbandry practices. This provision could prevent restricting those practices to benefit other natural resources.

Table 2: Applicable Laws and Regulations for Agriculture and Forest Resources	
Applicable Regulations	**Description**
Farmland Mapping and Monitoring Program (FMMP) (Government Code Section 65570, PRC Section 612)	Under the FMMP, the DOC assesses the location, quality, and quantity of agricultural lands and conversion of these lands over time. Agricultural designations include the categories of Prime Farmland, Farmland of Statewide Importance, Unique Farmland, Farmland of Local Importance, Grazing Land, Urban and Built-Up Land, and Other Land. FMMP uses the following definitions to describe farmland types. • Prime Farmland is defined by the DOC as "Land with the best combination of physical and chemical features able to sustain long term production of agricultural crops. This land has the soil quality, growing season, and moisture supply needed to produce sustained high yields. Land must have been used for production of irrigated crops at some time during the past four years." • Farmland of Statewide Importance is defined by the DOC as "Land similar to Prime Farmland that has a good combination of physical and chemical characteristics for the production of agricultural crops. This land has minor shortcomings, such as greater slopes or less ability to store soil moisture than Prime Farmland. Land must have been used for production of irrigated crops at some time during the past four years." • Unique Farmland is defined by the DOC as "Lesser quality soils used for the production of the State's leading agricultural crops. This land is usually irrigated, but may include non-irrigated orchards or vineyard as found in some climatic zones in California."
State Lands Commission Significant Land Inventory	The State Lands Commission is responsible for managing lands owned by the State, including lands that the State has received from the federal government. These lands total more than 4 million acres and include tide and submerged lands, swamp and overflow lands, the beds of navigable waterways, and State School Lands. The State Lands Commission has a legal responsibility for, and a strong interest in, protecting the ecological and Public Trust values associated with the State's sovereign lands, including the use of these lands for habitat preservation, open space and recreation. Scoping Plan projects located within these lands would be subject to the State Lands Commission permitting process.
Local	
Open Space Element	State law requires each city and county to adopt a general plan containing at least seven mandatory elements including an open space element. The open space element identifies

Table 2: Applicable Laws and Regulations for Agriculture and Forest Resources	
Applicable Regulations	**Description**
	open space resources in the community and strategies for protection and preservation of these resources. Agricultural and forested lands are among the land use types identified as open space in general plans.
Zoning	The city or county zoning code is the set of detailed requirements that implement the general plan policies at the level of the individual parcel. The zoning code presents standards for different land uses and identifies which land uses (e.g., agriculture, residential, commercial, industrial) are allowed in the various zoning districts of the jurisdiction. Since 1971, state law has required the city or county zoning code to be consistent with the jurisdiction's general plan, except in charter cities.

3. AIR QUALITY

A. Existing Conditions

Federal, State, and local governments all share responsibility for reducing air pollution. The California Air Resources Board (ARB) is California's lead air agency and controls emissions from mobile sources, fuels, and consumer products, as well as air toxics. ARB also coordinates local and regional emission reduction measures and plans that meet federal and State air quality limits. At the federal level, the U.S. Environmental Protection Agency (EPA) has oversight of State programs. In addition, EPA alone has jurisdiction to establish emission standards for certain mobile sources such as ships, trains, and airplanes.

1. Criteria Air Pollutants

Concentrations of emissions of criteria air pollutants are used to indicate the quality of the ambient air because these are the most prevalent air pollutants known to be deleterious to human health. A brief description of emission sources and acute and chronic health effects associated with each CAP is provided in Table 3.

Table 3: Sources and Health Effects of Criteria Air Pollutants			
Pollutant	**Sources**	**Acute[1] Health Effects**	**Chronic[2] Health Effects**
Ozone	Secondary pollutant resulting from reaction of reactive organic gases (ROG) and oxides of nitrogen (NO_X) in presence of sunlight. ROG emissions result from	Increased respiration and pulmonary resistance; cough, pain, shortness of breath, lung inflammation	Permeability of respiratory epithelia, possibility of permanent lung impairment

Table 3: Sources and Health Effects of Criteria Air Pollutants			
Pollutant	**Sources**	**Acute[1] Health Effects**	**Chronic[2] Health Effects**
	incomplete combustion and evaporation of chemical solvents and fuels; NO_X results from the combustion of fuels		
Carbon monoxide (CO)	Incomplete combustion of fuels; motor vehicle exhaust	Headache, dizziness, fatigue, nausea, vomiting, death	Permanent heart and brain damage
Nitrogen dioxide (NO_2)	Combustion devices; e.g., boilers, gas turbines, and mobile and stationary reciprocating internal combustion engines	Coughing, difficulty breathing, vomiting, headache, eye irritation, chemical pneumonitis or pulmonary edema; breathing abnormalities, cyanosis, chest pain, rapid heartbeat, death	Chronic bronchitis, decreased lung function
Sulfur dioxide (SO_2)	Coal and oil combustion, steel mills, refineries, and pulp and paper mills	Irritation of upper respiratory tract, increased asthma symptoms	Insufficient evidence linking SO_2 exposure to chronic health impacts
Respirable particulate matter (PM_{10}) and fine particulate matter ($PM_{2.5}$)	Fugitive dust, soot, smoke, mobile and stationary sources, construction, fires and natural windblown dust, and formation in The atmosphere by condensation and/or transformation of SO_2 and ROG	Breathing and respiratory symptoms, aggravation of existing respiratory and cardiovascular diseases, premature death	Alterations to the immune system, carcinogenesis
Lead	Metal processing	Reproductive/ developmental effects (fetuses and children)	Numerous effects including neurological, endocrine, and cardiovascular effects

[1] Acute" refers to effects of short-term exposures to criteria air pollutants, usually at relatively high concentrations.

[2] Chronic" refers to effects of long-term exposures to criteria air pollutants, even at relatively low concentrations.

Sources: US EPA 2011.

2. Ozone

Ozone is a photochemical oxidant (a substance whose oxygen combines chemically with another substance in the presence of sunlight) and the primary component of smog. Ozone is not directly emitted into the air but is formed through complex chemical reactions between precursor emissions of reactive organic gases (ROG) and oxides of nitrogen (NO_X) in the presence of sunlight. ROG are volatile organic compounds that are photochemically reactive. ROG emissions result primarily from incomplete

combustion and the evaporation of chemical solvents and fuels. NO_X are a group of gaseous compounds of nitrogen and oxygen that result from the combustion of fuels.

Anthropogenic emissions of the ozone precursors ROG and NO_X have decreased over the past several years because of more stringent motor vehicle standards and cleaner burning fuels. During the last 20 years the maximum amount of ROG and NO_X over an 8-hour period decreased by 17 percent. However, most counties in California are still in nonattainment for ozone.

3. Nitrogen Dioxide

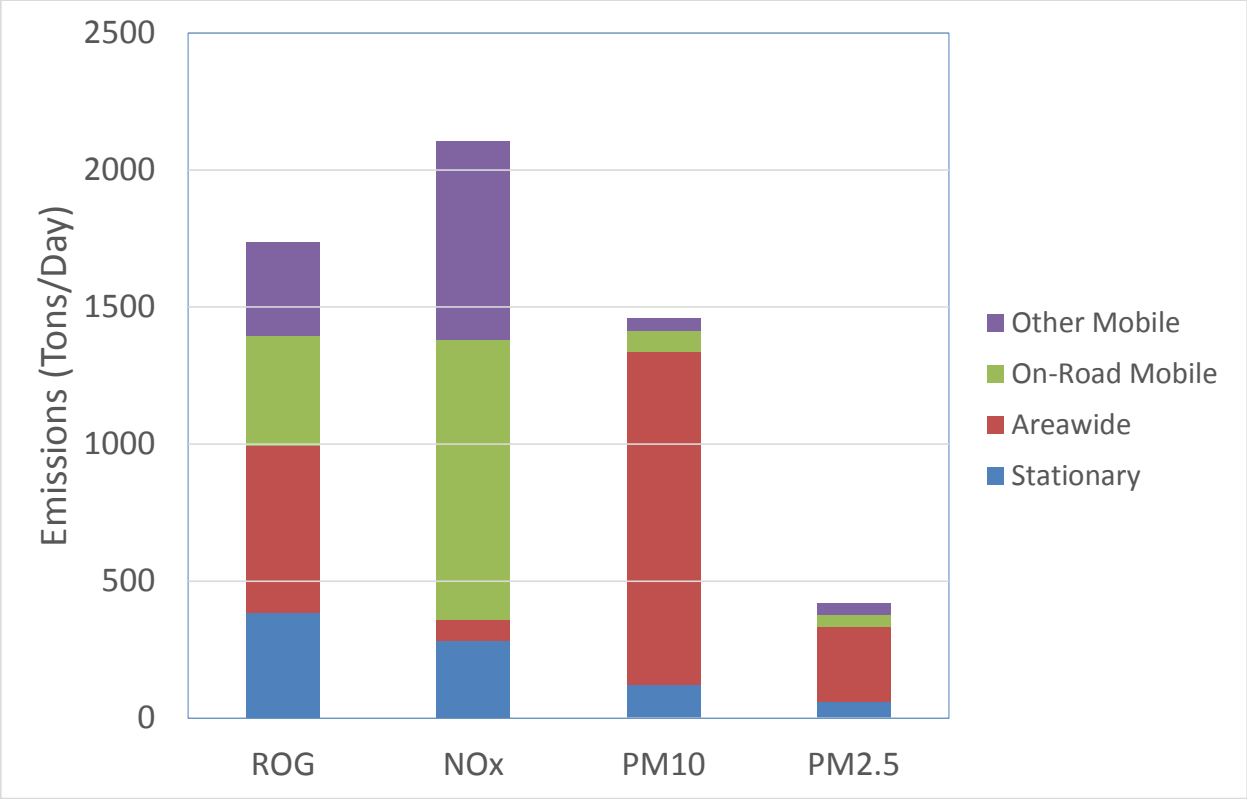
NO_2 is a brownish, highly-reactive gas that is present in all urban environments. The major human-made sources of NO_2 are combustion devices, such as boilers, gas turbines, and mobile and stationary reciprocating internal combustion engines. Combustion devices emit primarily nitric oxide (NO), which reacts through oxidation in the atmosphere to form NO_2. The combined emissions of NO and NO_2 are referred to as NO_X and are reported as equivalent NO_2. Because NO_2 is formed and depleted by reactions associated with photochemical smog (ozone), the NO_2 concentration in a particular geographical area may not be representative of the local sources of NO_X emissions (US EPA 2011).

4. Particulate Matter

Respirable particulate matter with an aerodynamic diameter of 10 micrometers or less is referred to as PM_{10}. PM_{10} consists of particulate matter emitted directly into the air, such as fugitive dust, soot, and smoke from mobile and stationary sources, construction equipment, fires and natural windblown dust, and particulate matter formed in the atmosphere by reaction of gaseous precursors (ARB 2009). $PM_{2.5}$ includes a subgroup of smaller particles that have an aerodynamic diameter of 2.5 micrometers or less. PM_{10} emissions in California are dominated by emissions from area sources, primarily fugitive dust from vehicle travel on unpaved and paved roads, farming operations, construction and demolition, and particles from residential fuel combustion. Direct emissions of PM_{10} have increased slightly in California over the last 20 years, and are projected to continue to increase. $PM_{2.5}$ emissions have remained relatively steady over the last 20 years and are projected to increase slightly through 2020. Emissions of $PM_{2.5}$ are dominated by the same sources as emissions of PM_{10} (ARB 2009).

5. Emission Inventory

Exhibit 1 summarizes emissions of CAPs within California for various source categories. According to California's emission inventory, mobile sources are the largest contributor to the estimated annual average for air pollutant levels of ROG and NO_X accounting for approximately 43 percent and 83 percent, respectively, of the total emissions. Area wide sources account for approximately 83 percent and 65 percent of California's PM_{10} and $PM_{2.5}$ emissions, respectively (ARB 2013).



Source: ARB 2013
Exhibit 1 California 2012 Emission Inventory

6. Toxic Air Contaminants

Concentrations of toxic air contaminants (TACs) are also used to indicate the quality of ambient air. A TAC is defined as an air pollutant that may cause or contribute to an increase in mortality or in serious illness, or that may pose a hazard to human health. TACs are usually present in minute quantities in the ambient air; however, their high toxicity or health risk may pose a threat to public health even at low concentrations.

According to the *California Almanac of Emissions and Air Quality* (ARB 2009), the majority of the estimated health risks from TACs can be attributed to relatively few compounds, the most predominant being particulate-exhaust emissions from diesel-fueled engines (diesel PM). Diesel PM differs from other TACs in that it is not a single substance, but rather a complex mixture of hundreds of substances. Although diesel PM is emitted by diesel-fueled internal combustion engines, the composition of the emissions varies depending on engine type, operating conditions, fuel composition, lubricating oil, and whether an emissions control system is being used. Unlike some TACs, no ambient monitoring data are available for diesel PM because no routine measurement method currently exists. However, ARB has made preliminary concentration estimates based on a PM exposure method. This method uses the ARB emissions inventory's PM_{10} database, ambient PM_{10} monitoring data, and the results

from several studies to estimate concentrations of diesel PM. In addition to diesel PM, the TACs for which data are available that pose the greatest existing ambient risk in California are benzene, 1,3-butadiene, acetaldehyde, carbon tetrachloride, hexavalent chromium, paradichlorobenzene, formaldehyde, methylene chloride, and perchloroethylene.

Diesel PM poses the greatest health risk among these 10 TACs mentioned. Since 1990, the health risk associated with diesel PM has been in California has reduced by 52 percent. Overall, levels of most TACs, except paradichlorobenzene and formaldehyde, have decreased since 1990 (ARB 2009: Chapter 5).

B. Regulatory Setting

Applicable laws and regulations associated with air quality are discussed in Table 4.

Table 4: Applicable Laws and Regulations for Air Quality

Regulation	Description
Federal	
Clean Air Act (CAA) (40 CFR)	CAA, which was last amended in 1990, requires the EPA to set National Ambient Air Quality Standards (NAAQS) for pollutants considered harmful to public health and the environment. CAA established two types of NAAQS: primary standards set limits to protect public health, including the health of "sensitive" populations such as asthmatics, children, and the elderly; and secondary standards set limits to protect public welfare, including protection against decreased visibility, damage to animals, crops, vegetation, and buildings. EPA Office of Air Quality Planning and Standards has set NAAQS for six principal pollutants, which are called "criteria" pollutants. Title III of the CAA directed the EPA to promulgate national emissions standards for Hazardous Air Pollutants. The CAA also required the EPA to promulgate vehicle or fuel standards containing reasonable requirements that control toxic emissions, at a minimum to benzene and formaldehyde. Performance criteria were established to limit mobile-source emissions of toxics, including benzene, formaldehyde, and 1,3-butadiene. In addition, Section 219 required the use of reformulated gasoline in selected areas with the most severe ozone nonattainment conditions to further reduce mobile-source emissions.
SmartWay	SmartWay is an EPA program that reduces transportation-related emissions by creating incentives to improve supply chain fuel efficiency. It aims to increase the availability and market penetration of fuel efficient technologies and strategies that help freight companies save money while also reducing adverse environmental impacts.

Table 4: Applicable Laws and Regulations for Air Quality	
Regulation	**Description**
State	
California Clean Air Act (CCAA) CCR (Titles 13 and 17)	ARB is the agency responsible for coordination and oversight of State and local air pollution control programs in California and for implementing the CCAA. The CCAA, which was adopted in 1988, required the ARB to establish California ambient air quality standards (CAAQS).
Waste Heat and Carbon Emissions Reduction Act	This Act is designed to encourage the development of new combined heat and power (CHP) systems in California with a generating capacity of not more than 20 megawatts. Section 2843 of the Act provides that the Energy Commission's guidelines require that CHP systems: be designed to reduce waste energy; have a minimum efficiency of 60 percent; have NO_X emissions of no more than 0.07 pounds per megawatt-hour; be sized to meet the eligible customer generation thermal load; operate continuously in a manner that meets the expected thermal load and optimizes the efficient use of waste heat; be cost effective, technologically feasible, and environmentally beneficial.
Local	
Air Districts	Air Districts have primary responsibility for preparation, adoption, and implementation of mobile, stationary, and area emission control measures and for the preparation of the SIP and any amendments.

4. BIOLOGICAL RESOURCES

A. Existing Conditions

The state's geography and topography have created distinct local climates ranging from high rainfall in northwestern mountains to the driest place in North America, Death Valley. North to south, the state extends for almost 800 miles, bridging the temperate rainforests in the Pacific Northwest and the subtropical arid deserts of Mexico. Many parts of the state experience Mediterranean weather patterns, with cool, wet winters and hot, dry summers. Summer rain is indicative of the eastern mountains and deserts, driven by the western margin of the North American monsoon. Along the northern coast abundant precipitation and ocean air produces foggy, moist conditions. High mountains have cooler conditions, with a deep winter snow pack in normal climate years. Desert conditions exist in the rain shadow of the mountain ranges (CDFW 2015).

While the state is largely considered to have a Mediterranean climate, it can be further subdivided into six major climate types: Desert, Marine, Cool Interior, Highland, Steppe,

and Mediterranean. California deserts, such as the Mojave, are typified by a wide range of elevation with more rain and snow in the high ranges, and hot, dry conditions in valleys. Cool Interior and Highland climates can be found on the Modoc Plateau, Klamath, Cascade, and Sierra ranges. Variations in slope, elevation, and aspect of valleys and mountains result in a range of microclimates for habitats and wildlife. For example, the San Joaquin Valley, exhibiting a Mediterranean climate, receives sufficient springtime rain to support grassland habitats, while still remaining hot and relatively dry in summer. Steppe climates include arid, shrub-dominated habitats that can be found in the Owens Valley, east of the Sierra Nevada, and San Diego, located in coastal southern California (CDFW 2015).

The marine climate has profound influence over terrestrial climates, particularly near the coast. Additionally, the state is known for variability in precipitation because of the El Niño-Southern Oscillation (ENSO) and the Pacific Decadal Oscillation (PDO). Oscillations are the cyclical shifting of high and low pressure systems, as evidenced by the wave pattern of the jet stream in the northern hemisphere. The ENSO is the cycle of air pressure systems influenced by the location of warm and cold sea temperatures. El Niño events occur when waters are warmer in the eastern Pacific Ocean, typically resulting in greater precipitation in southern California and less precipitation in northern California, and La Niña events occur when waters are colder in the eastern Pacific resulting in drier than normal conditions in southern California and wetter conditions in northern California during late summer and winter. The warmer ocean temperatures associated with El Niño conditions also result in decreased upwelling in the Pacific Ocean (CDFW 2015).

a) Plant Diversity

California has the highest numbers of native and endemic plant species of any state, with approximately 6,500 species, subspecies, and varieties of plants, representing 32 percent of all vascular plants in the United States. Nearly one-third of the state's plant species are endemic, and California has been recognized as one of 34 global hotspots for plant diversity. Within the California Floristic Province, which encompasses the Mediterranean area of Oregon, California, and northwestern Baja, 2,124 of the 3,488 species are endemic, representing a 61 percent rate of endemism. Over 200 species, subspecies, and varieties of native plants are designated as rare, threatened, or endangered by state law, and over 2,000 more plant taxa are considered to be of conservation concern (CDFW 2015).

b) Wildlife Diversity

California has a large number of animal species, representing a substantial proportion of the wildlife species nationwide. The state's diverse natural communities provide a wide variety of habitat conditions for wildlife. The state's wildlife species include approximately 100 reptile species, 75 amphibian species, 650 bird species, and 220

mammal species. Additionally, 48 mammals, 64 birds, 72 amphibians and reptiles, and 20 freshwater fish live in California and nowhere else (CDFW 2015).

California exhibits a wide range of aquatic habitats from the Pacific Ocean to isolated hillside seeps, to desert oases that support both water-dependent species and provide essential seasonal habitat for terrestrial species. Perennial and ephemeral rivers and streams, riparian areas, vernal pools, and coastal wetlands support a diverse array of flora and fauna, including 150 animal and 52 plant species that are designated special status species. The California Natural Diversity Database identifies 123 different aquatic habitat-types in California, based on fauna. Of these, 78 are stream habitat-types located in seven major drainage systems: Klamath, Sacramento-San Joaquin, North/Central Coast, Lahontan, Death Valley, South Coast, and Colorado River systems. These drainage systems are geologically separated and contain distinctive fishes and invertebrates. California has approximately 70 native resident and anadromous fish species, and 72 percent of the native freshwater fishes in California are either listed, or possible candidates for listing as threatened or endangered, or are extinct (CDFW 2015).

B. Regulatory Setting

Applicable laws and regulations associated with biological resources are discussed in Table 5.

Table 5: Applicable Laws and Regulations for Biological Resources

Applicable Law	Description
Federal	
Federal Endangered Species Act (ESA)	Designates and provides for protection of threatened and endangered plant and animal species, and their critical habitat. Two sections of the ESA address take of threatened and endangered species. Section 7 covers actions that would result in take of a federally-listed species and have a federal discretionary action. Section 10 regulates actions that would result in take of threatened or endangered species and a non-federal agency is the lead agency for the action. Section 10 of the ESA requires preparation of a habitat conservation plan (HCP). More than 430 HCPs have been approved nation-wide.
Migratory Bird Treaty Act	Makes it unlawful to take or possess any migratory nongame bird (or any part of such migratory nongame bird) as designated in the Migratory Bird Treaty Act.
Clean Water Act (CWA)	Requires the permitting and monitoring of all discharges to surface water bodies. Section 404 requires a permit from the U.S. Army Corps of Engineers (USACE) for a discharge from dredged or fill materials into Waters of the U.S., including

Table 5: Applicable Laws and Regulations for Biological Resources	
Applicable Law	**Description**
	wetlands. Section 401 requires a permit from a regional water quality control board (RWQCB) for the discharge of pollutants. By federal law, every applicant for a federal permit or license for an activity that may result in a discharge into a California water body, including wetlands, must request State certification that the proposed activity would not violate State and federal water quality standards.
Rivers and Harbors Act of 1899	Requires permit or letter of permission from USACE prior to any work being completed within navigable waters.
EPA Section 404 (b)(1) Guidelines	Requires USACE to analyze alternatives in a sequential approach such that USACE must first consider avoidance and minimization of impacts to the extent practicable to determine whether a proposed discharge can be authorized.
California Desert Conservation Area Plan (CDCA)	Comprises one of two national conservation areas established by Congress in 1976. FLPMA outlines how BLM would manage public lands. Congress specifically provided guidance for the management of the CDCA and directed the development of the 1980 CDCA Plan.
Federal Noxious Weed Act of 1974 (P.L. 93-629) (7 U.S.C. 2801 et seq.; 88 Stat. 2148)	Establishes a federal program to control the spread of noxious weeds. Authority is given to the Secretary of Agriculture to designate plants as noxious weeds by regulation, and the movement of all such weeds in interstate or foreign commerce was prohibited except under permit.
Executive Order 13112, “Invasive Species,” February 3, 1999	Federal agencies are mandated to take actions to prevent the introduction of invasive species, provide for their control, and minimize the economic, ecological, and human health impacts that invasive species cause.
Executive Order 11988, “Floodplain Management,” May 24, 1977	Requires federal agencies to avoid to the extent possible the long- and short-term adverse impacts associated with the occupancy and modification of flood plains and to avoid direct and indirect support of floodplain development wherever there is a practicable alternative.
Executive Order 11990, “Protection of Wetlands,” May 24, 1977	Requires all federal agencies to consider wetland protection as an important part of their policies and take action to minimize the destruction, loss, or degradation of wetlands, and to preserve and enhance the natural and beneficial values of wetlands.
Executive Order 13186, “Responsibilities of Federal Agencies to Protect Migratory Birds,”	Requires that each federal agency taking actions that have, or are likely to have, a measurable negative effect on migratory bird populations develop and implement a Memorandum of Understanding (MOU) with the U.S. Fish

Table 5: Applicable Laws and Regulations for Biological Resources	
Applicable Law	**Description**
January 10, 2001	and Wildlife Service (USFWS) that shall promote the conservation of migratory bird populations.
Bald and Golden Eagle Protection Act	Declares it is illegal to take, possess, sell, purchase, barter, offer to sell or purchase or barter, transport, export or import a bald or golden eagle, alive or dead, or any part, nest or egg of these eagles unless authorized. Active nest sites are also protected from disturbance during the breeding season.
BLM Manual 6840 — Special Status Species Management	Establishes special status species policy on BLM land for plant and animal species and the habitats on which they depend. The policy refers to species designated by the BLM State Director as sensitive.
Listed Species Recovery Plans and Ecosystem Management Strategies	Provides guidance for the conservation and management of sufficient habitat to maintain viable populations of listed species and ecosystems. Relevant examples include, but are not limited to, the Desert Tortoise Recovery Plan, Flat-tailed Horned Lizard Rangewide Management Strategy; Amargosa Vole Recovery Plan; and Recovery Plan for Upland Species of the San Joaquin Valley.
State	
California Endangered Species Act of 1984 (Fish and Game Code, sections 2050 through 2098)	Protects California's rare, threatened, and endangered species.
Natural Community Conservation Planning (NCCP) Act 1991	The primary objective of the NCCP program is to conserve natural communities at the ecosystem level while accommodating compatible land use. An NCCP identifies and provides for the regional or areawide protection of plants, animals, and their habitats, while allowing compatible and appropriate economic activity. There are currently 23 NCCPs that have been adopted or are in progress in California (CDFW 2014b).
Porter-Cologne Water Quality Control Act	Requires that each of the nine RWQCBs prepare and periodically update basin plans for water quality control. Each basin plan sets forth water quality standards for surface water and groundwater and actions to control nonpoint and point sources of pollution to achieve and maintain these standards.
Wetlands Preservation (Keene-Nejedly California Wetlands	California has established a successful program of regional, cooperative efforts to protect, acquire, restore, preserve, and manage wetlands. These programs include, but are not

Table 5: Applicable Laws and Regulations for Biological Resources	
Applicable Law	**Description**
Preservation Act) (PRC, Section 5810 et seq.)	limited to, the Central Valley Habitat Joint Venture, the San Francisco Bay Joint Venture, the Southern California Wetlands Recovery Project, and the Inter-Mountain West Joint Venture.
California Wilderness Preservation System (PRC, Section 5093.30 et seq.)	Establishes a California wilderness preservation system that consists of State-owned areas to be administered for the use and enjoyment of the people in such manner as will leave them unimpaired for future use and enjoyment as wilderness, provide for the protection of such areas, preserve their wilderness character, and provide for the gathering and dissemination of information regarding their use and enjoyment as wilderness.
Significant Natural Areas (Fish and Game Code section 1930 et seq.)	Designates certain areas such as refuges, natural sloughs, riparian areas, and vernal pools as significant wildlife habitat.
Protection of Birds and Nests (Fish and Game Code section 3503 and 3503.5)	Protects California's birds by making it unlawful to take, possess, or needlessly destroy the nest or eggs of any bird. Raptors (e.g., hawks and owls) are specifically protected.
Migratory Birds (Fish and Game Code section 3513)	Protects California's migratory birds by making it unlawful to take or possess any migratory nongame bird as designated in the Migratory Bird Treaty Act or any part of such migratory nongame birds.
Fur-bearing Mammals (Fish and Game Code sections 4000 and 4002)	Lists fur-bearing mammals which require a permit for take.
Fully Protected Species (Fish and Game Code Sections 3511,4700, 5050, and 5515)	Identifies several amphibian, reptile, fish, bird, and mammal species that are Fully Protected. The California Department of Fish and Wildlife (CDFW) cannot issue a take permit for these species, except for take related to scientific research.
California Environmental Quality Act (CEQA Guidelines 15380)	CEQA defines rare species more broadly than the definitions for species listed under the state and federal Endangered Species Acts. Under section 15830, species not protected through state or federal listing but nonetheless demonstrable as "endangered" or "rare" under CEQA should also receive consideration in environmental analyses. Included in this category are many plants considered rare by the California Native Plant Society (CNPS) and some animals on the CDFW's Special Animals List.
Oak Woodlands (California PRC Section	Requires counties to determine if a project within their jurisdiction may result in conversion of oak woodlands that

Table 5: Applicable Laws and Regulations for Biological Resources	
Applicable Law	**Description**
21083.4)	would have a significant adverse effect on the environment. If the lead agency determines that a project would result in a significant adverse effect on oak woodlands, mitigation measures to reduce the significant adverse effect of converting oak woodlands to other land uses are required.
Lake and Streambed Alteration Agreement (Fish and Game Code sections 1600 et seq.)	Regulates activities that may divert, obstruct, or change the natural flow or the bed, channel, or bank of any river, stream, or lake in California designated by CDFW in which there is at any time an existing fish or wildlife resource or from which these resources derive benefit. Impacts to vegetation and wildlife resulting from disturbances to waterways are also reviewed and regulated during the permitting process.
California Desert Native Plants Act of 1981 (Food and Agricultural Code section 80001 et seq. and California Fish and Game Code sections 1925-1926)	Protects non-listed California desert native plants from unlawful harvesting on both public and private lands in Imperial, Inyo, Kern, Los Angeles, Mono, Riverside, San Bernardino, and San Diego counties. Unless issued a valid permit, wood receipt, tag, and seal by the commissioner or sheriff, harvesting, transporting, selling, or possessing specific desert plants is prohibited.
Food and Agriculture Code, Section 403	The California Department of Food and Agriculture is designated to prevent the introduction and spread of injurious insect or animal pests, plant diseases, and noxious weeds.
Noxious Weeds (Title 3, California Code of Regulations, Section 4500)	List of plant species that are considered noxious weeds.
Local	
Various City and County General Plans	General plans typically designate areas for land uses, guiding where new growth and development should occur while providing a plan for the comprehensive and long-range management, preservation, and conservation of and natural resources and open-space lands.
Various Local Ordinances	Local ordinances provide regulations for proposed projects for activities such as grading plans, erosion control, tree removal, protection of sensitive biological resources and open space.

5. CULTURAL RESOURCES

A. Existing Conditions

a) Prehistoric Overview

California was occupied by different prehistoric cultures dating to at least 12,000 to 13,000 years ago. Evidence for the presence of humans during the Paleoindian Period prior to about 8,000 years ago is relatively sparse and scattered throughout the State; most surface finds of fluted Clovis or Folsom projectile points or archaeological sites left by these highly mobile hunter-gatherers are associated with Pleistocene lakeshores, the Channel Islands, or the central and southern California coast (Rondeau et al 2007). Archaeological evidence from two of the Northern Channel Islands located off the coast from Santa Barbara indicates the islands were colonized by Paleoindian peoples at least 12,000 years ago, likely via seaworthy boats (Erlandson et al 2007). By 10,000 years ago, inhabitants of this coastal area were using fishhooks, weaving cordage and basketry, hunting marine mammals and sea birds, and producing ornamental shell beads for exchange with people living in the interior of the State (Erlandson et al 2007). This is the best record of early maritime activity in the Americas, and combined with the fluted points, indicates California was colonized by both land and sea during the Paleoindian period (Jones and Klar 2007).

With climate changes between 10,000 and 7,000 years ago at the end of the Pleistocene and into the early Holocene, Lower Archaic peoples adjusted to the drying of pluvial lakes, rise in sea level, and substantial alterations in vegetation communities. Approximately 6,000 years ago, vegetation communities similar to those of the present were established in the majority of the state, while the changes in sea level also affected the availability of estuarine resources (Jones and Klar 2007). The archaeological record indicates subsistence patterns during the Lower Archaic and subsequent Middle Archaic Period shifted to an increased emphasis on plant resources, as evidenced by an abundance of milling implements in archaeological sites dating between 8,000 and 3,000 years ago.

Approximately 3,000 years ago, during the Upper Archaic and Late Prehistoric Periods, the complexity of the prehistoric archaeological record reflects increases in specialized adaptations to locally available resources such as acorns and salmon, in permanently occupied settlements, and in the expansion of regional populations and trade networks (Moratto 1984; Jones and Klar 2007). During the Upper Archaic, marine shell beads and obsidian continue to be the hallmark of long-distance trade and exchange networks developed during the preceding period (Hughes and Milliken 2007). Large shell midden/mounds at coastal and inland sites in central and southern California, for example, attest to the regular reuse of these locales over hundreds of years or more from the Upper Archaic into the Late Prehistoric period. In the San Francisco Bay region alone, over 500 shell mounds were documented in the early 1900s (Moratto 1984).

Changes in the technology used to pursue and process resources are some of the hallmarks of the Late Prehistoric period. These include an increase in the prevalence of mortars and pestles, a diversification in types of watercraft and fishhooks, and the earliest record for the bow and arrow in the State that occurs in both the Mojave Desert and northeast California nearly 2,000 years ago (Jones and Klar 2007). The period also witnessed the beginning of ceramic manufacture in the southeast desert region, southwest Great Basin, and parts of the Central Valley.

During the Late Prehistoric period, the development of social stratification and craft specialization accompanied the increase in sedentism, as indicated by the variety of artifacts, including bone tools, coiled and twined basketry, obsidian tools, marine shell beads, personal ornaments, pipes, and rattles, by the use of clamshell disk beads and strings of dentalium shell as a form of currency, and by variation in burial types and associated grave goods (Moratto 1984; Jones and Klar 2007). Pictographs, painted designs that are likely less than 1,000 years old, and other non-portable rock art created during this period likely had a religious or ceremonial function (Gilreath 2007). Osteological evidence points to intergroup conflict and warfare in some regions during this period (Jones and Klar 2007), and there also appears to have been a decline or disruption in the long-distance trade of obsidian and shell beads approximately 1,200 years ago in parts of the State (Hughes and Milliken 2007).

b) Ethnographic Overview

At the time of European contact, California was the home of approximately 310,000 indigenous peoples with a complex of cultures distinguished by linguistic affiliation and territorial boundaries (Kroeber 1925, Cook 1978, Heizer 1978, Ortiz 1983, d'Azevedo 1986). At least 70 distinct native Californian cultural groups, with even more subgroups, inhabited the vast lands within the State. The groups and subgroups spoke between 74 and 90 languages, plus a large number of dialects (Shipley 1978: p. 80, University of California at Berkeley 2009-2010).

In general, these mainly sedentary, complex hunter-gatherer groups of indigenous Californians shared similar subsistence practices (hunting, fishing, and collecting plant foods), settlement patterns, technology, material culture, social organization, and religious beliefs (Kroeber 1925, Heizer 1978, Ortiz 1983, d'Azevedo 1986). Permanent villages were situated along the coast, interior waterways, and near lakes and wetlands. Population density among these groups varied, depending mainly on availability and dependability of local resources, with the highest density of people in the northwest coast and Santa Barbara Channel areas and the least in the State's desert region (Cook 1976). Networks of foot trails were used to connect groups to hunting or plant gathering areas, rock quarries, springs or other water sources, villages, ceremonial places, or distant trade networks (Heizer 1978).

The social organization of California's native peoples varied throughout the State, with villages or political units generally organized under a headman who was also the head

of a lineage or extended family or achieved the position through wealth (Bean 1978). For some groups, the headman also functioned as the religious ceremonial leader. Influenced by their Northwest Coast neighbors, the differential wealth and power of individuals was the basis of social stratification and prestige between elites and commoners for the Chilula, Hupa, Karok, Tolowa, Wiyot, and Yurok in the northwest corner of the State. Socially complex groups were also located along the southern California coast where differential wealth resulted in hierarchical classes and hereditary village chiefs among the Chumash, Gabrielino, Juaneño, and Luiseño (Bean and Smith 1978, Arnold and Graesch 2004).

At the time of Spanish contact, religious practices among native Californian groups varied, but ethnographers have recognized several major religious systems (Bean and Vane 1978). Many of the groups in the north-central part of the State practiced the *Kuksu* cult, primarily a ceremonial and dance organization, with a powerful shaman as the leader. Log drums, flutes, rattles, and whistles accompanied the elaborate ceremonial dances. The World Renewal cult in the northwestern corner of the State extended as far north as Alaska, entailed a variety of annual rites to prevent natural disasters, maintain natural resources and individual health, and were funded by the wealthy class. The *Toloache* cult was widespread in central and southern California and involved the use of narcotic plant (commonly known as datura or jimsonweed) materials to facilitate the acquisition of power. On the southern coast among Takic-speaking groups, the basis of Gabrielino, Juaneño, and Luiseño religious life was the *Chinigchinich* cult, which appeared to have developed from the Toloache cult. Chinigchinich, the last of a series of heroic mythological figures, gave instruction on laws and institutions, taught people how to dance, and later withdrew into heaven where he rewarded the faithful and punished those who disobeyed his laws. The Chinigchinich religion seems to have been relatively new when the Spanish arrived, and could have been influenced by Christianity.

Trade and exchange networks were a significant part of the economy and social organization among California's Native American groups (Heizer 1978). Obsidian, steatite, beads, acorns, baskets, animal skins, and dried fish were among the variety of traded commodities. Inland groups supplied obsidian from sources along the Sierra Nevada Mountains, in Napa Valley, and in the northeast corner of the State. Coastal groups supplied marine shell beads, ornaments, and marine mammal skins. In addition to trading specific items, clamshell disk beads made from two clam species available on the Pacific coast were widely used as a form of currency (Kroeber 1922). In northwestern California, groups used strings of dentalium shell as currency.

The effect of Spanish settlement and missionization in California marks the beginning of a devastating disruption of native culture and life ways, with forced population movements, loss of land and territory (including traditional hunting and gathering locales), enslavement, and decline in population numbers from disease, malnutrition, starvation, and violence during the historic period (Castillo 1978). In the 1830s, foreign disease epidemics swept through the densely populated Central Valley, adjacent

foothills, and North Coast Ranges decimating indigenous population numbers (Cook 1978). By 1850, with their lands, resources and way of life being overrun by the steady influx of non-native people during the Gold Rush, California's native population was reduced to about 100,000; by 1900, there were only 20,000 or less than seven percent of the pre-contact number. Existing reservations were created in California by the federal government beginning in 1858 but encompass only a fraction of native lands.

In 2004, the Native American population in California was estimated at over 383,000 (OPR 2005). Although acknowledged as non-federally recognized California Native American tribes on the contact list maintained by the Native American Heritage Commission (NAHC), many groups continue to await federal tribal status recognition. As of 2005, there were 109 federally recognized tribes within the state, along with dozens of non-federally recognized tribes. Members of these tribes have specific cultural beliefs and traditions with unique connections to areas of California that are their ancestral homelands.

c) Historic Overview

Post-contact history for the State is generally divided into the Spanish period (1769–1822), Mexican period (1822–1848), and American period (1848–present). The establishment of Fort Ross by Alaska-based Russian traders also influenced post-contact history for a short period (1809–1841) in the region north of San Francisco Bay. Although there were brief visits along the Pacific coast by European explorers (Spanish, Russian, and British) between 1529 and 1769 of the territory claimed by Spain, the expeditions did not journey inland.

i) Spanish Period (1769–1822)

Spain's colonization of California began in 1769 with the overland expeditions from San Diego to San Francisco Bay by Lt. Colonel Gaspar de Portolá, and the establishment of a mission and settlement at San Diego. Between 1769 and 1823, the Spanish and the Franciscan Order established a series of 21 missions paralleling the coast along El Camino Real between San Diego and Sonoma (Rolle 1969). Between 1769 and 1782, Spain built four presidios (San Diego, Monterey, San Francisco, and Santa Barbara) to protect the missions, and by 1871 had established two additional pueblos at Los Angeles and San José.

Under Spanish law, large tracts of land, including cattle ranches and farms, fell under the jurisdiction of the missions. Native Americans were removed from their traditional lands, converted to Christianity, concentrated at the missions, and used as labor on the mission farms and ranches (Castillo 1978). Since the mission friars had civil as well as religious authority over their converts, they held title to lands in trust for indigenous groups. The lands were to be repatriated once the native peoples learned Spanish laws and culture.

ii) Russian Period (1809–1841)

In 1809, Alaska-based Russians started exploring the northern California coast with the goal of hunting otter and seal and feeding their Alaskan colonies. The first Russian settlement was established in 1811–1812 by the Russian–American Fur Company to protect the lucrative marine fur trade and to grow produce for their Alaskan colonies. In 1841, as a result of the decline in local sea otter population and the failure of their agricultural colony, combined with a change in international politics, the Russians withdrew from California (Schuyler 1978).

iii) Mexican Period (1822–1848)

Following independence from Spain in 1822, the economy during the Mexican period depended on the extensive rancho system, carved from the former Franciscan missions and at least 500 land grants awarded in the State's interior to Mexican citizens (Beck and Haase 1974; Staniford 1975). Captain John Sutter, who became a Mexican citizen, received the two largest land grants in the Sacramento Valley. In 1839, Sutter founded the trading and agricultural empire named New Helvetia that was headquartered at Sutter's Fort, near the confluence of the Sacramento and American Rivers in today's City of Sacramento (Hoover et al 2002).

Following adoption of the Secularization Act of 1833, the Mexican government privatized most Franciscan lands, including holdings of their California missions. Although secularization schemes had called for redistribution of lands to Native American neophytes who were responsible for construction of the mission empire, the vast mission lands and livestock holdings were instead redistributed by the Mexican government through several hundred land grants to private, non-indigenous ranchers (Castillo 1978, Hoover et al 2002). Most Native American converts returned to traditional lands that had not yet been colonized or found work with the large cattle ranchos being carved out of the mission lands.

iv) American Period (1848–present)

In 1848, shortly after California became a territory of the U.S. with the signing of the Treaty of Guadalupe Hidalgo ending Mexican rule, gold was discovered on the American River at Sutter's Mill in Coloma. The resulting Gold Rush era influenced the history of the State, the nation, and the world. Thousands of people flocked to the gold fields in the Mother Lode region that stretches along the western foothills of the Sierra Nevada Mountains, and to the areas where gold was also discovered in other parts of the State, such as the Klamath and Trinity River basins (Caltrans 2008). In 1850, California became the 31st state, largely as a result of the Gold Rush.

d) Paleontological Setting

California's fossil record is exceptionally prolific with abundant specimens representing a diverse range of marine, lacustrine, and terrestrial organisms recovered from

Precambrian rocks as old as 1 billion years to as recent as 6,000 year-old Holocene deposits (refer to geologic timescale in Table 6). These fossils provide key data for charting the course of the evolution or extinction of a variety of life on the planet, both locally and internationally. Paleontological specimens also provide key evidence for interpreting paleoenvironmental conditions, sequences and timing of sedimentary deposition, and other critical components of the earth's geologic history. Fossils are considered our most significant link to the biological prehistory of the earth (Jefferson 2004).

Table 6: Divisions of Geologic Time

Era	Period	Time in Millions of Years Ago (approximately)	Epoch
Cenozoic	Quaternary	**<0.01**	Holocene
		2.6	Pleistocene
	Tertiary	**5.3**	Pliocene
		23	Miocene
		34	Oligocene
		56	Eocene
		65	Paleocene
Mesozoic	Cretaceous	**145**	
	Jurassic	**200**	
	Triassic	**251**	
Paleozoic	Permian	**299**	
	Carboniferous	**359**	
	Devonian	**416**	
	Silurian	**444**	
	Ordovician	**488**	
	Cambrian	**542**	
Precambrian		**2,500**	

Source: USGS Geologic Names Committee 2010

Because the majority of the State was underwater until the Tertiary period, marine fossils older than 65 million years are not common and are exposed mainly in the mountains along the border with Nevada and the Klamath Mountains, and Jurassic shales, sandstones, and limestones are exposed along the edges of the Central Valley, portions of the Coast, Transverse, and Peninsular Ranges, and the Mojave and Colorado Deserts. Some of the oldest fossils in the State, extinct marine vertebrates called conodonts, have been identified at Anza-Borrego Desert SP in Ordovician sediments dating to circa 450 million years ago. Limestone outcrops of Pennsylvanian

and Permian in the Providence Mountains SRA contain a variety of marine life, including brachiopods, fusulinids, crinoids, that lived some 300 to 250 million years ago.

Fossils from the Jurassic sedimentary layers in San Joaquin, San Luis Obispo, and Stanislaus counties include ammonites, bivalves, echinoderms and marine reptiles, all of which were common in the coastal waters. Gymnosperms (seed-bearing plants) such as cycads, conifers, and ginkgoes are preserved in terrestrial sediments from this period, evidence that the Jurassic climate was warm and moderately wet. In the great Central Valley, marine rocks record the position of the Cretaceous shoreline as the eroded ancestral Sierra Nevada sediments were deposited east of the rising Coast Ranges and became the rock layers of the Sacramento and San Joaquin valleys. These Cretaceous sedimentary deposits have yielded abundant fossilized remains of plants, bivalves, ammonites, and marine reptiles (Paleontology Portal 2003).

Along coastal southern California where steep coastal mountains plunged into the warm Pacific Ocean an abundance of fossil marine invertebrates, such as ammonites, nautilus, tropical snails and sea stars, have been found in today's coastal and near-coastal deposits from the Cretaceous Period. A rare armored dinosaur fossil dated to about 75 million years ago during the Cretaceous was discovered in San Diego County during a highway project. It is the most complete dinosaur skeleton ever found in California (San Diego Natural History Museum 2010). The lack of fossil remains of the majority of earth's large vertebrates, particularly terrestrial, marine, and flying reptiles (dinosaurs, ichthyosaurs, mosasaurs, pleisosaurs, and pterosaurs), as well as many species of terrestrial plants, after the end of the Cretaceous and the start of the Tertiary periods 65 million years ago (the K-T boundary) attests to their abrupt extinction.

B. Regulatory Setting

Applicable laws and regulations associated with cultural resources are discussed in Table 7.

Table 7: Applicable Laws and Regulations for Cultural Resources

Applicable Regulation	Description
Federal	
NHPA of 1966	The NHPA requires federal agencies to consider the preservation of historic and prehistoric resources. The Act authorizes the Secretary of the Interior to expand and maintain a National Register of Historic Places (NRHP), and it establishes an Advisory Council on Historic Preservation (ACHP) as an independent federal entity. Section 106 of the Act requires federal agencies to take into account the effects of their undertakings on historic properties and afford the ACHP a reasonable opportunity to comment on the undertaking prior to licensing or approving the expenditure of funds on any

Table 7: Applicable Laws and Regulations for Cultural Resources	
Applicable Regulation	**Description**
	undertaking that may affect properties listed, or eligible for listing, in the NRHP.
National Environmental Policy Act (NEPA) of 1969	NEPA requires federal agencies to foster environmental quality and preservation. Section 101(b)(4) declares that one objective of the national environmental policy is to "preserve important historic, cultural, and natural aspects of our national heritage." For major federal actions significantly affecting environmental quality, federal agencies must prepare, and make available for public comment, an environmental impact statement.
Archaeological Resources Protection Act of 1979 (NRPA)(16 USC 470aa-470II)	NRPA requires a permit for any excavation or removal of archaeological resources from public lands or Indian lands. The statute provides both civil and criminal penalties for violation of permit requirements and for excavation or removal of protected resources without a permit.
Native American Graves Protection and Repatriation Act of 1990 (NAGPRA) (PL 101–601)	NAGPRA vests ownership or control of certain human remains and cultural items excavated or discovered on federal or tribal lands, in designated Native American tribes, organizations, or groups. The Act further requires notification of the appropriate Secretary or other head of any federal agency upon the discovery of Native American cultural items on federal or tribal lands; proscribes trafficking in Native American human remains and cultural items; requires federal agencies and museums to compile an inventory of Native American human remains and associated funerary objects, and to notify affected Indian tribes of this inventory; and provides for the repatriation of Native American human remains and specified objects possessed or controlled by federal agencies or museums.
Advisory Council Regulation, Protection of Historic Properties (SHPO) (36 CFR 800)	Establishes procedures for compliance with Section 106 of the NHPA. These regulations define the Criteria of Adverse Effect, define the role of State Historic Preservation Officer (SHPO) in the Section 106 review process, set forth documentation requirements, and describe procedures to be followed if significant historic properties are discovered during implementation of an undertaking. Prehistoric and historic resources deemed significant (i.e., eligible for listing in the NRHP, per 36 CFR 60.4) must be considered in project planning and construction. The responsible federal agency must submit any proposed undertaking that may affect NRHP-eligible properties to the SHPO for review and comment prior to project approval.
National Park Service Regulations, National	Sets forth procedures for nominating properties to the NRHP, and present the criteria to be applied in evaluating the eligibility

Table 7: Applicable Laws and Regulations for Cultural Resources	
Applicable Regulation	**Description**
Register of Historic Places (NRHP) (36 CFR 60)	of historic and prehistoric resources for listing in the NRHP.
Archaeology and Historic Preservation; Secretary of the Interior's Standards and Guidelines (FR 190:44716–44742)	Non-regulatory technical advice about the identification, evaluation, documentation, study, and other treatment of cultural resources. Notable in these Guidelines are the "Standards for Archaeological Documentation" (p. 44734) and "Professional Qualifications Standards for Archaeology" (pp. 44740–44741).
American Indian Religious Freedom Act of 1978	The American Indian Religious Freedom Act pledges to protect and preserve the traditional religious rights of American Indians, Aleuts, Eskimos, and Native Hawaiians. Before the act was passed, certain federal laws interfered with the traditional religious practices of many American Indians. The Act establishes a national policy that traditional Native American practices and beliefs, sites (and right of access to those sites), and the use of sacred objects shall be protected and preserved.
Department of Transportation Act of 1966, Section 4(f)	Section 4(f) of the Act requires a comprehensive evaluation of all environmental impacts resulting from federal-aid transportation projects administered by the FHA, FTA, and FAA that involve the use—or interference with use—of several types of land: public park lands, recreation areas, and publicly or privately owned historic properties of federal, state, or local significance. The Section 4(f) evaluation must be sufficiently detailed to permit the U.S. Secretary of Transportation to determine that there is no feasible and prudent alternative to the use of such land, in which case the project must include all possible planning to minimize harm to any park, recreation, wildlife and waterfowl refuge, or historic site that would result from the use of such lands. If there is a feasible and prudent alternative, a proposed project using Section 4(f) lands cannot be approved by the Secretary. Detailed inventories of the locations and likely impacts on resources that fall into the Section 4(f) category are required in project-level environmental assessments.
State	
California Health and Safety Code Section and California PRC, Section	Disturbance of human remains without the authority of law is a felony (California Health and Safety Code, Section 7052). According to State law (California Health and Safety Code, Section 7050.5, California PRC, Section 5097.98), if human remains are discovered or recognized in any location other than a dedicated cemetery, there shall be no further excavation or

Table 7: Applicable Laws and Regulations for Cultural Resources	
Applicable Regulation	**Description**
	disturbance of the site or any nearby area reasonably suspected to overlie adjacent human remains until 1) the coroner of the county has been informed and has determined that no investigation of the cause of death is required; 2) and if the remains are of Native American origin, and if the descendants from the deceased Native Americans have made a recommendation to the landowner or the person responsible for the excavation work for means of treating or disposing of with appropriate dignity the human remains and any associated grave goods as provided in PRC Section 5097.98; or the Native American Heritage Commission was unable to identify a descendent or the descendent failed to make a recommendation within 24 hours after being notified by the Commission. According to the California Health and Safety Code, six or more human burials at one location constitute a cemetery (Section 8100), and disturbance of Native American cemeteries is a felony (Section 7052). Section 7050.5 requires that construction or excavation be stopped in the vicinity of discovered human remains until the coroner can determine whether the remains are those of a Native American. If the remains are determined to be Native American, the coroner must contact the Native American Heritage Commission, who has jurisdiction over Native American remains (California Health and Safety Code, 7052.5c; PRC, Section 5097.98).
California Environmental Quality Act (Guidelines Section 15380)	CEQA requires that public agencies financing or approving public or private projects must assess the effects of the project on cultural resources. Furthermore, it requires that, if a project results in significant impacts on important cultural resources, alternative plans or mitigation measures must be considered; only significant cultural resources, however, need to be addressed. Thus, prior to the development of mitigation measures, the importance of cultural resources must be determined.
AB 52 (Statutes of 2014)	AB 52 recognizes that tribal sovereignty and the unique relationship of California local governments and public agencies with California Native American tribal governments, while respecting the interests and roles of project proponents. This requires specific consultation processes for project review and approval.

Table 7: Applicable Laws and Regulations for Cultural Resources	
Applicable Regulation	**Description**
Local	
City/County General Plans	Policies, goals, and implementation measures in county or city general plans may contain measures applicable to cultural and paleontological resources. In addition to the enactment of local and regional preservation ordinances, CEQA requires that resources included in local registers be considered (pursuant to section 5020.1(k) of the PRC). Therefore, local county and municipal policies, procedures, and zoning ordinances must be considered in the context of project-specific undertakings. Cultural resources are generally discussed in either the open space element or the conservation element of the general plan. Many local municipalities include cultural resources preservation elements in their general plans that include some mechanism pertaining to cultural resources in those communities. In general, the sections pertaining to archaeological and historical properties are put in place to afford the cultural resources a measure of local protection. The policies outlined in the individual general plans should be consulted prior to any undertaking or project.
Cooperative Agreements Among Agencies	Cooperative agreements among land managing agencies (BLM, National Park Service, U.S. Forest Services, California State Parks, Bureau of Indian Affairs, Department of Defense, to name a few) the SHPO and ACHP may exist and will need to be complied with on specific projects. In addition, certain agencies have existing Programmatic Agreements requiring permits (California Public Utilities Commission [CPUC], BLM) to complete archaeological investigations and employ the Secretary of Interior's Professional Qualification Standards and Guidelines (36 CFR 61).

6. ENERGY DEMAND

A. Existing Conditions

Excluding Federal offshore areas, California ranks third in the Nation in crude oil production in 2014. California ranks third in the Nation in conventional hydroelectric generation, second in net electricity generation from other renewable energy resources, and first as a producer of electricity from geothermal energy (in 2012). In 2012, California, left with one remaining nuclear power plant after the San Onofre Nuclear Generating Station was permanently shut down in 2012, ranked fourteenth in net electricity generation from nuclear power plants and eighth in nuclear net summer capacity. Average site electricity consumption in California homes is among the lowest

in the nation (6.9 megawatt hours per year), according to the Energy Information Administration's (U.S. EIA's) Residential Energy Consumption Survey last conducted in 2009. In 2012, California's per capita energy consumption ranked 49th in the Nation, due in part to its mild climate and energy efficiency programs (U.S. EIA 2013b).

In 2013, California's in-state electricity generation sources consisted of: 44.3 percent natural gas, 18.8 percent renewable sources, 8.8 percent nuclear, 7.8 percent large hydropower, and 7.8 percent from coal. Approximately 63 percent of total electricity generation was from in-state sources, with the remaining electricity coming from out-of-state imports from the Pacific Northwest (12 percent) and the Southwest (21 percent) (California Energy Commission (CEC) 2014a).

In 2012, Californians consumed 274,449 gigawatt hours (GWh) of electricity and 12,897 million therms of natural gas, primarily in the commercial, residential, and industrial sectors. A ~~California Energy Commission (~~CEC~~)~~ staff forecast of future energy demand shows that electricity consumption will grow by between 0.79 and 1.56 percent per year between 2014 and 2024; and natural gas consumption is expected to reach up to 12,801 million therms by 2024 for an annual average growth rate of up to 0.02 percent (CEC 2014b).

The CEC is the State's primary energy policy and planning agency. Created by the Legislature in 1974, and located in Sacramento, six basic responsibilities guide the CEC as it sets state energy policy: forecasting future energy needs; promoting energy efficiency and conservation by setting the State's appliance and building efficiency standards; supporting public interest energy research that advances energy science and technology through research, development and demonstration programs; developing renewable energy resources and alternative renewable energy technologies for buildings, industry and transportation; licensing thermal power plants 50 megawatts or larger; and planning for and directing state response to energy emergencies.
The CPUC also plays a key role in regulating investor-owned electric, natural gas, telecommunications, water, railroad, rail transit, and passenger transportation companies. The CPUC regulates investor-owned electric and natural gas utilities operating in California, including Pacific Gas and Electric Company, Southern California Edison, San Diego Gas and Electric Company, and Southern California Gas Company.

B. Regulatory Setting

Applicable laws and regulations associated with energy resources are discussed in Table 8.

Table 8: Applicable Laws and Regulations for Energy Resources

Regulation	Description
Federal	
Energy Policy and Conservation Act	The Energy Policy and Conservation Act of 1975 sought to ensure that all vehicles sold in the U.S. would meet certain fuel

Table 8: Applicable Laws and Regulations for Energy Resources	
Regulation	**Description**
	economy goals. Through this Act, Congress established the first fuel economy standards for on-road motor vehicles in the U.S. Pursuant to the Act, the National Highway Traffic and Safety Administration, which is part of the U.S. Department of Transportation (USDOT), is responsible for establishing additional vehicle standards and for revising existing standards. From 1986 to 2012, fuel economy standards for passenger vehicles remained nearly stagnant at between 20.7 mpg for trucks and 27.5 mpg for light duty cars. In 2010, EPA adopted new passenger vehicle standards starting with the 2012 model year that incorporates GHG emissions standards on a vehicle-footprint basis and to accommodate the efficiencies of electric and other alternatively fueled vehicles. Additional standards for models years through 2025 were adopted in 2012. Translating the GHG standards to miles per gallon equivalents, the projected fuel economy standard for new passenger cars and light trucks combined would increase from 30.1 to 54.5 between 2012 and 2025 model years. Until 2010, heavy-duty vehicles (i.e., vehicles and trucks over 8,500 pounds gross vehicle weight) were not subject to fuel economy standards. In 2011, NHTSA and EPA released fuel economy standards for medium and heavy-duty vehicles (over 8,500 pounds gross vehicle weight) for 2014 through 2018 model years. Fuel economy standards for these vehicles vary by vehicle profession and include explicit mpg goals as well as percent reduction targets. Stricter fuel economy standards for medium and heavy-duty vehicles are expected in 2015. Compliance with federal fuel economy standards is determined on the basis of each manufacturer's average fuel economy for the portion of its vehicles produced for sale in the U.S. The Corporate Average Fuel Economy (CAFE) program, administered by the EPA, was created to determine vehicle manufacturers' compliance with the fuel economy standards. The EPA calculates a CAFE value for each manufacturer based on city and highway fuel economy test results and vehicle sales. Based on the information generated under the CAFE program, the USDOT is authorized to assess penalties for noncompliance.
Energy Policy Act (EPAct) of 1992	EPAct was passed to reduce the country's dependence on foreign petroleum and improve air quality. EPAct includes several parts intended to build an inventory of alternative fuel

Table 8: Applicable Laws and Regulations for Energy Resources	
Regulation	**Description**
	vehicles (AFVs) in large, centrally fueled fleets in metropolitan areas. EPAct requires certain federal, state, and local government and private fleets to purchase a percentage of light duty AFVs capable of running on alternative fuels each year. In addition, financial incentives are included in EPAct. Federal tax deductions will be allowed for businesses and individuals to cover the incremental cost of AFVs. States are also required by the act to consider a variety of incentive programs to help promote AFVs.
Energy Policy Act of 2005	The Energy Policy Act of 2005 was signed into law on August 8, 2005. Generally, the act provides for renewed and expanded tax credits for electricity generated by qualified energy sources, such as landfill gas; provides bond financing, tax incentives, grants, and loan guarantees for a clean renewable energy and rural community electrification; and establishes a federal purchase requirement for renewable energy.
State	
Warren-Alquist State Energy Resources Conservation and Development Act of 1974	The Warren-Alquist Act is the legislation that created and gives statutory authority to the CEC (formally called the State Energy Resources Conservation and Development Commission).
Integrated Energy Policy Reports (SB 1389)	Senate Bill 1389 (Bowen, Chapter 568, Statutes of 2002) requires the CEC to prepare a biennial integrated energy policy report that contains an assessment of major energy trends and issues facing the State's electricity, natural gas, and transportation fuel sectors and provides policy recommendations to conserve resources; protect the environment; ensure reliable, secure, and diverse energy supplies; enhance the State's economy; and protect public health and safety (PRC Section 25301[a]). The CEC prepares these assessments and associated policy recommendations every 2 years, with updates in alternate years, as part of the Integrated Energy Policy Report (IEPR). Preparation of the IEPR involves close collaboration with federal, state, and local agencies and a wide variety of stakeholders in an extensive public process to identify critical energy issues and develop strategies to address those issues.
California Long-Term Energy	On September 18, 2008, the CPUC adopted California's first Long Term Energy Efficiency Strategic Plan, presenting a single

Table 8: Applicable Laws and Regulations for Energy Resources	
Regulation	**Description**
Efficiency Strategic Plan	roadmap to achieve maximum energy savings across all major groups and sectors in California. This comprehensive plan for 2009 to 2020 is the State's first integrated framework of goals and strategies for saving energy, covering government, utility, and private sector actions, and holds energy efficiency to its role as the highest priority resource in meeting California's energy needs. The plan was updated in January 2011 to include a lighting chapter.
California Building Energy Efficiency Standards (24 CCR Part 6)	California's Building Energy Efficiency Standards conserve electricity and natural gas in new building construction and are administered by the CEC. Local governments enforce the standards through local building permitting and inspections. The CEC has updated these standards on a periodic basis. The new 2013 Building Energy Efficiency Standards, which take effect on January 1, 2014, are approximately 25 percent more efficient than previous standards for residential construction and 30 percent more efficient for nonresidential construction.
Comprehensive Energy Efficiency Plan for Existing Buildings (AB 758)	Assembly Bill 758 (Skinner, Chapter 470, Statutes 2009) requires the CEC, in collaboration with the CPUC and stakeholders, to develop a comprehensive program to achieve greater energy efficiency in the State's existing buildings.
California Renewable Energy Portfolio Standard (RPS) (SB X1-2)	In 2011, Governor Brown signed SB X1-2, which requires retail sellers of electricity, including investor-owned utilities and community choice aggregators, to provide at least 33 percent of their electricity supply (portfolio) from renewable sources by 2020. The CPUC and the CEC jointly implement the Statewide RPS program through rulemakings and monitoring the activities of electric energy utilities in the state.
California Qualifying Facility and Combined Heat and Power Program Settlement	In December 2010, the CPUC approved California's Qualifying Facility and Combined Heat and Power Program Settlement, which established a CHP framework for the State's investor-owned utilities. The settlement established a near-term target of 3,000 megawatts (MW) of CHP for entities under the jurisdiction of the CPUC, although this target includes not just new CHP, but capacity from renewal of contracts due to expire in the next 3 years. The CPUC has also adopted a settlement agreement that includes reforms to the Rule 21 interconnection process to provide a clear, predictable path to interconnection of distributed generation while maintaining the safety and reliability of the grid (CEC 2012).
California Strategy to Reduce	Assembly Bill 2076 (Chapter 936, Statutes of 2000) requires the CEC and the ARB to develop and submit to the Legislature a

Table 8: Applicable Laws and Regulations for Energy Resources	
Regulation	**Description**
Petroleum Dependence (AB 2076)	strategy to reduce petroleum dependence in California. The statute requires the strategy to include goals for reducing the rate of growth in the demand for petroleum fuels. In addition, the strategy is required to include recommendations to increase transportation energy efficiency as well as the use of non-petroleum fuels and advanced transportation technologies including alternative fuel vehicles, hybrid vehicles, and high-fuel efficiency vehicles. The strategy, *Reducing California's Petroleum Dependence*, was adopted by the CEC and ARB in 2003. The strategy recommends that California reduce inroad gasoline and diesel fuel demand to 15 percent below 2003 demand levels by 2020 and maintain that level for the foreseeable future; the Governor and Legislature work to establish national fuel economy standards that double the fuel efficiency of new cars, light trucks, and sport utility vehicles; and increase the use of nonpetroleum fuels to 20 percent of on-road fuel consumption by 2020 and 30 percent by 2030.
Alternative and Renewable Fuel and Vehicle Technology Program	Assembly Bill 118 (Statues of 2007) created the CEC's Alternative and Renewable Fuel and Vehicle Technology Program. The statute, subsequently amended by Assembly Bill 109 (Statues of 2008), authorizes the CEC to develop and deploy alternative and renewable fuels and advanced transportation technologies to help attain the State's climate change policies.
Alternative Fuels Plan	Assembly Bill 1007 requires the CEC to prepare a state plan to increase the use of alternative fuels in California. Any environmental document prepared for a strategic growth plan, regional blueprint general plan metropolitan planning or transportation plan should include an evaluation of alternative fuels for emissions or criteria pollutants, TACs, GHGs, water pollutants, and other harmful substances, and their impacts on petroleum consumption, and set goals for increased alternative fuel use in the state for the next decades, and recommend policies to ensure the alternative fuel goals are attained, including standards on transportation fuels and vehicle and policy mechanisms to ensure vehicles operating on alternative fuels use those fuels to the maximum extent feasible.
Bioenergy Action Plan (Executive Order S-06-06)	Executive Order #S-06-06 establishes targets for the use and production of biofuels and biopower and directs state agencies to work together to advance biomass programs in California while providing environmental protection and mitigation. This executive order establishes the following target to increase the production and use of bioenergy, including ethanol and biodiesel fuels made

Table 8: Applicable Laws and Regulations for Energy Resources	
Regulation	**Description**
	from renewable resources: produce a minimum of 20 percent of its biofuels within California by 2010, 40 percent by 2020, and 75 percent by 2050. The Executive Order also calls for the state to meet a target for use of biomass electricity.
Governor's Low Carbon Fuel Standard (Executive Order S-01-07)	Executive Order #S-01-07 establishes a statewide goal to reduce the carbon intensity of California's transportation fuels by at least 10 percent by 2020 through establishment of the LCFS. The executive order requires LCFS to be incorporated into the State Alternative Fuels Plan required by AB 1007 and is one of the proposed discrete early action GHG reduction measures identified by CARB pursuant to AB 32. In January, 2010, the Office of Administrative Law approved the LCFS regulation.
Local	
City/County General Plans	Many cities and counties have general plan elements and policies that specifically address energy use and conservation. Those energy conservation measures outlined in the various county and city general plans contain goals, objectives, and policies aimed at reducing energy consumption. Proponents of specific projects would be required to consult the applicable general plans and design the projects consistent with the guidelines of those general plans in which the projects are located.

7. GEOLOGY AND SOILS

A. Existing Conditions

The state's topography is highly varied and includes 1,340 miles of seacoast, as well as high mountains, inland flat valleys, and deserts. Elevations in California range from 282 feet below sea level in Death Valley to 14,494 feet at the peak of Mount Whitney. The mean elevation of California is approximately 2,900 feet. The climate of California is as highly varied as its topography. Depending on elevation, proximity to the coast, and altitude, climate types include temperate oceanic, highland, sub-arctic, Mediterranean, steppe, and desert (USGS 1995). The average annual precipitation across all California climate types is approximately 23 inches and approximately 75 percent of the state's annual precipitation falls between November and March, primarily in the form of rain, with the exception of high mountain elevations (DWR 2003). Average annual precipitation ranges from more than 100 inches in the mountainous areas within the Smith River in Del Norte County to less than 2 inches in Death Valley, illustrating the extreme differences in precipitation levels within the State (Mount 1995). Overall, northern California is wetter than southern California with the majority of the State's annual precipitation occurring in the northern coastal region.

a) Geology

Plate tectonics and climate have played major roles in forming California's dramatic landscape. California is located on the active western boundary of the North American continental plate in contact with the oceanic Pacific Plate and the Gorda Plate north of the Mendocino Triple Junction. The dynamic interactions between these three plates and California's climate are responsible for the unique topographic characteristics of California, including rugged mountain ranges, long and wide flat valleys, and dramatic coastlines. Tectonics and climate also have a large effect on the occurrence natural environmental hazards, such as earthquakes, landslides, and volcanic formations.

b) Landslides

Landsliding or mass wasting is a common erosional process in California and has played an integral part in shaping the State's landscape. Typically, landslides occur in mountainous regions of the State, but they can also occur in areas of low relief, including coastal bluffs, along river and stream banks, and inland desert areas. Landsliding is the gravity-driven downhill mass movement of soil, rock, or both and can vary considerably in size, style and rate of movement, and type depending on the climate of a region, the steepness of slopes, rock type and soil depth, and moisture regime (Harden 1997).

c) Earthquakes

Earthquakes are a common and unpredictable occurrence in California. The tectonic development of California began millions of years ago by a shift in plate tectonics that converted the passive margin of the North American plate into an active margin of compressional and translational tectonic regimes. This shift in plate tectonics continues to make California one of the most geomorphically diverse, active, and picturesque locations in the U.S. While some areas of California are more prone to earthquakes, such as northern, central, and southern coastal areas of California, all areas of California are prone to the effects of ground shaking due to earthquakes. While scientists have made substantial progress in mapping earthquake faults where earthquakes are likely to occur, and predicting the potential magnitude of an earthquake in any particular region, they have been unable to precisely predict where or when an earthquake will occur and what its magnitude will be.

d) Tsunamis

Coastal communities around the circum Pacific have long been prone to the destructive effects of tsunamis. Tsunamis are a series of long-period, high-magnitude ocean waves that are created when an outside force displaces large volumes of water. Throughout time, major subduction zone earthquakes in both the Northern and Southern Hemispheres have moved the Earth's crust at the ocean bottom sending vast amounts of waters into motion and spreading tsunami waves throughout the Pacific Ocean.

Tsunamis can also occur from subareal and submarine landslides that displace large volumes of water. Subaeral landslide-generated tsunamis can be caused by seismically generated landslides, rock falls, rock avalanches, and eruption or collapse of island or coastal volcanoes. Submarine landslide-generated tsunamis are typically caused by major earthquakes or coastal volcanic activity. In contrast to a seismically generated tsunami, seismic seiches are standing waves that are caused by seismic waves traveling through a closed (lake) or semi-enclosed (bay) body of water. Due to the long-period seismic waves that originate after an earthquake, seiches can be observed several thousand miles away from the origin of the earthquakes. Small bodies of water, including lakes and ponds, are especially vulnerable to seismic seiches.

e) Volcanoes

A volcano is an opening in the Earth's crust through which magma escapes to the surface where it is extruded as lava. Volcanism may be spectacular, involving great fountains of molten rock, or tremendous explosions that are caused by the build-up of gases within the volcano (Ritchie and Gates 2001). Some of the most active volcanic areas in California are located within the Cascade Range - a volcanic chain that is a result of compressional tectonics along the Cascadia subduction zone.

f) Active Faults

A fault is defined as a fracture or zone of closely associated fractures along rocks that on one side have been displaced with respect to those on the other side. Most faults are the result of repeated displacement that may have taken place suddenly or by slow creep. A fault is distinguished from fractures or shears caused by landsliding or other gravity-induced surficial failures. A fault zone is a zone of related faults that commonly are braided and subparallel, but may be branching and divergent. A fault zone has significant width (with respect to the scale of the fault being considered, portrayed, or investigated), ranging from a few feet to several miles (Bryant and Hart 2007).

In the State of California earthquake faults have been designated as being active through a process that has been described by the 1972 Alquist-Priolo Earthquake Fault Zoning Act. An active fault is defined by the State as one that has "had surface displacement within Holocene time (about the last 11,000 years)." This definition does not, of course, mean that faults lacking evidence for surface displacement within Holocene time are necessarily inactive. A fault may be presumed to be inactive based on satisfactory geologic evidence; however, the evidence necessary to prove inactivity sometimes is difficult to obtain and locally may not exist.

B. Regulatory Setting

Applicable laws and regulations associated with geology and soils are discussed in Table 9.

Table 9: Applicable Laws and Regulations for Geology and Soils	
Regulation	**Description**
Federal	
Safe Drinking Water Act - Federal Underground Injection Control Class VI Program for Carbon Dioxide Geology Sequestration Wells	Under the Safe Drinking Water Act (SDWA), the Federal Underground Injection Control (UIC) Class VI Program for Carbon Dioxide Geologic Sequestration Wells requires states and owners or operators to submit all permit applications to the appropriate EPA Region for a Class VI permit to be issued. These requirements, also known as the Class VI rule, are designed to protect underground sources of drinking water. The Class VI rule builds on existing UIC Program requirements, with extensive tailored requirements that address carbon dioxide injection for long-term storage to ensure that wells used for geologic sequestration are appropriately sited, constructed, tested, monitored, funded, and closed. The rule also affords owners or operators injection depth flexibility to address injection in various geologic settings in the U.S. in which geologic sequestration may occur, including very deep formations and oil and gas fields that are transitioned for use as carbon dioxide storage sites.
Safe Drinking Water Act - Federal Underground Injection Control Class II Program for Oil and Gas Related Injection Wells	The Class II Program for Oil and Gas Related Injection Wells requires states to meet EPA's minimum requirements for UIC programs including strict construction and conversion standards and regular testing and inspection. Enhanced oil and gas recovery wells may either be issued permits or be authorized by rule. Disposal wells are issued permits.
CWA	This law was enacted to restore and maintain the chemical, physical, and biological integrity of the nation's waters by regulating point and nonpoint pollution sources, providing assistance to publicly owned treatment works for the improvement of wastewater treatment, and maintaining the integrity of wetlands. This includes the creation of a system that requires states to establish discharge standards specific to water bodies (National Pollution Discharge Elimination System [NPDES]), which regulates storm water discharge from construction sites through the implementation of a Storm Water Pollution Prevention Plan (SWPPP). In California, the State's NPDES permit program is implemented and administered by the local Regional Water Quality Control Boards.
Earthquake Hazards Reduction Act and National Earthquake	This Act established the National Earthquake Hazards Reduction Program to reduce the risks to life and property from future earthquakes. This program was significantly amended in November 1990 by the National Earthquake Hazards Reduction

Table 9: Applicable Laws and Regulations for Geology and Soils	
Regulation	**Description**
Hazards Reduction Program Act	Program Act by refining the description of agency responsibilities, program goals and objectives.
State	
Seismic Hazards Mapping Act, PRC Section 2690–2699.	The Seismic Hazards Mapping Act (the Act) of 1990 (PRC, Chapter 7.8, Division 2) directs the California DOC, Division of Mines and Geology (now called California Geological Survey [CGS]) to delineate Seismic Hazard Zones. The purpose of the Act is to reduce the threat to public health and safety and to minimize the loss of life and property by identifying and mitigating seismic hazards. These include areas identified that are subject to the effects of strong ground shaking, such as liquefaction, landslides, tsunamis, and seiches. Cities, counties, and state agencies are directed to use seismic hazard zone maps developed by CGS in their land-use planning and permitting processes. The Act requires that site-specific geotechnical investigations be performed prior to permitting most urban development projects within seismic hazard zones.
Alquist-Priolo Earthquake Fault Zoning Act	California's Alquist-Priolo Act (PRC 2621 et seq.), originally enacted in 1972 as the Alquist-Priolo Special Studies Zones Act and renamed in 1994, is intended to reduce the risk to life and property from surface fault rupture during earthquakes. The Alquist-Priolo Act prohibits the location of most types of structures intended for human occupancy across the traces of active faults and strictly regulates construction in the corridors along active faults (Earthquake Fault Zones). It also defines criteria for identifying active faults, giving legal weight to terms such as "active," and establishes a process for reviewing building proposals in and adjacent to Earthquake Fault Zones. Under the Alquist-Priolo Act, faults are zoned, and construction along or across them is strictly regulated if they are "sufficiently active" and "well-defined." A fault is considered sufficiently active if one or more of its segments or strands shows evidence of surface displacement during Holocene time (defined for the purposes of the act as within the last 11,000 years). A fault is considered well-defined if its trace can be clearly identified by a trained geologist at the ground surface or in the shallow subsurface, using standard professional techniques, criteria, and judgment.
California Division of Oil, Gas, and Geothermal Resources (DOGGR), PRC	PRC Section 3106 mandates the supervision of drilling, operation, maintenance, and abandonment of oil wells for the purpose of preventing: damage to life, health, property, and natural resources; damage to underground and surface waters suitable for irrigation or domestic use; loss of oil, gas, or reservoir

Table 9: Applicable Laws and Regulations for Geology and Soils	
Regulation	**Description**
Section 3106.	energy; and damage to oil and gas deposits by infiltrating water and other causes. In addition, the DOGGR regulates drilling, production, injection, and gas storage operations in accordance with 14 CCR Chapter 4, Subchapter 1.
Landslide Hazard Identification Program, PRC Section 2687(a)	The Landslide Hazard Identification Program requires the State Geologist to prepare maps of landslide hazards within urbanizing areas. According to PRC Section 2687(a), public agencies are encouraged to use these maps for land use planning and for decisions regarding building, grading, and development permits.
California Building Standards Code (CBSC) (24 CCR)	California's minimum standards for structural design and construction are given in the CBSC (24 CCR). The CBSC is based on the Uniform Building Code (International Code Council 1997), which is used widely throughout U.S. (generally adopted on a state-by-state or district-by-district basis) and has been modified for California conditions with numerous, more detailed or more stringent regulations. The CBSC provides standards for various aspects of construction, including (i.e., not limited to) excavation, grading, and earthwork construction; fills and embankments; expansive soils; foundation investigations; and liquefaction potential and soil strength loss. In accordance with California law, proponents of specific projects would be required to comply with all provisions of the CBSC for certain aspects of design and construction.
Local	
Geotechnical Investigation	Local jurisdictions typically regulate construction activities through a process that may require the preparation of a site-specific geotechnical investigation. The purpose of a site-specific geotechnical investigation is to provide a geologic basis for the development of appropriate construction design. Geotechnical investigations typically assess bedrock and Quaternary geology, geologic structure, soils, and the previous history of excavation and fill placement. Proponents of specific projects that require design of earthworks and foundations for proposed structures will need to prepare geotechnical investigations on the physical properties of soil and rock at the site prior to project design.
Local Grading and Erosion Control Ordinances	Many counties and cities have grading and erosion control ordinances. These ordinances are intended to control erosion and sedimentation caused by construction activities. A grading permit is typically required for construction-related projects. As part of the permit, project applicants usually must submit a grading and erosion control plan, vicinity and site maps, and other supplemental information. Standard conditions in the grading

Table 9: Applicable Laws and Regulations for Geology and Soils	
Regulation	**Description**
	permit include a description of Best Management Practices similar to those contained in a SWPPP.
City/County General Plans	Most city and county general plans include an element that covers geology and soil resources within that jurisdiction.

8. GREENHOUSE GASES

A. Existing Conditions

The Physical Scientific Basis of Climate Change

Certain gases in the earth's atmosphere, classified as GHGs, play a critical role in determining the earth's surface temperature. Solar radiation enters the earth's atmosphere from space. A portion of the radiation is absorbed by the earth's surface and a smaller portion of this radiation is reflected back toward space. This absorbed radiation is then emitted from the earth as low-frequency infrared radiation. The frequencies at which bodies emit radiation are proportional to temperature. The earth has a much lower temperature than the sun; therefore, the earth emits lower frequency radiation. Most solar radiation passes through GHGs; however, infrared radiation is absorbed by these gases. As a result, radiation that otherwise would have escaped back into space is instead "trapped," resulting in a warming of the atmosphere. This phenomenon, known as the greenhouse effect, is responsible for maintaining a habitable climate on earth.

Prominent GHGs contributing to the greenhouse effect are carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), hydrofluorocarbons, perfluorocarbons, and sulfur hexafluoride. Human-caused emissions of these GHGs in excess of natural ambient concentrations are believed responsible for intensifying the greenhouse effect and leading to a trend of unnatural warming of the earth's climate, known as global climate change or global warming. It is "extremely likely" that more than half of the observed increase in global average surface temperature from 1951 to 2010 was caused by the anthropogenic increase in GHG concentrations and other anthropogenic causes of climate change together (Intergovernmental Panel on Climate Change [IPCC] 2014).

Climate change is a global problem. GHGs are global pollutants, unlike criteria air pollutants and toxic air contaminants, which are pollutants of regional and local concern. Whereas pollutants with localized air quality effects have relatively short atmospheric lifetimes (about one day), GHGs have long atmospheric lifetimes (one to several thousand years). GHGs persist in the atmosphere for long enough time periods to be dispersed around the globe. Although the lifetime of any particular GHG molecule is dependent on multiple variables and cannot be determined with any certainty, it is understood that more CO_2 is emitted into the atmosphere than is sequestered by ocean

uptake, vegetation, and other forms of sequestration. Of the total annual human-caused CO_2 emissions, approximately 55 percent is sequestered through ocean and land uptake every year, averaged over the last 50 years, whereas the remaining 45 percent of human-caused CO_2 emissions remains stored in the atmosphere (IPCC 2013).

The quantity of GHGs in the atmosphere that ultimately result in climate change is not precisely known, but is enormous; no single project alone would measurably contribute to an incremental change in the global average temperature, or to global, local, or micro climates. From the standpoint of CEQA, GHG impacts relative to global climate change are inherently cumulative.

Greenhouse Gas Emission Sources

GHG emissions are attributable in large part to human activities associated with the transportation, industrial/manufacturing, utility, residential, commercial, and agricultural emissions sectors. In California, the transportation sector is the largest emitter of GHGs, followed by electricity generation (ARB 2015b). Emissions of CO_2 are byproducts of fossil fuel combustion. Methane, or CH_4, is a highly potent GHG that primarily results from escaped emissions of natural gas and from anaerobic decomposition of organic substances in agricultural practices and landfills. N_2O is also largely attributable to agricultural practices and soil management. CO_2 sinks, or reservoirs, include vegetation and the ocean, which absorb CO_2 through sequestration and dissolution (CO_2 dissolving into the water), respectively, two of the most common processes for removing CO_2 from the atmosphere.

Effects of Climate Change on the Environment

The IPCC was established in 1988 by the World Meteorological Organization and the United Nations Environment Programme to provide the world with a scientific view on climate change and its potential effects. According to the IPCC global average temperature is expected to increase relative to the 1986-2005 period by 0.3–4.8 degrees Celsius (°C) (0.5-8.6 degrees Fahrenheit [°F]) by the end of the 21st century (2081-2100), depending on future GHG emission scenarios (IPCC 2014). According to the California Natural Resources Agency, temperatures in California are projected to increase 2.7°F above 2000 averages by 2050 and, depending on emission levels, 4.1–8.6°F by 2100 (California Natural Resources Agency [CNRA] 2012).

Physical conditions beyond average temperatures could be affected by the accumulation of GHG emissions. For example, changes in weather patterns resulting from increases in global average temperature are expected to result in a decreased volume of precipitation falling as snow in California and an overall reduction in snowpack in the Sierra Nevada. Based upon historical data and modeling, the California Department of Water Resources (DWR) projects that the Sierra snowpack will decrease by 25 to 40 percent from its historic average by 2050 (DWR 2008). An increase in precipitation falling as rain rather than snow also could lead to increased potential for floods because water that would normally be held in the Sierra Nevada until spring

could flow into the Central Valley concurrently with winter storm events (CNRA 2012). This scenario would place more pressure on California's levee/flood control system.

Another outcome of global climate change is sea level rise. Sea level rose approximately seven inches during the last century and, assuming that sea-level changes along the California coast continue to reflect global trends, sea level along the state's coastline in 2050 could be 10-18 inches higher than in 2000, and 31-55 inches higher by the end of this century (CNRA 2012).

As the existing climate throughout California changes over time, the ranges of various plant and wildlife species could shift or be reduced, depending on the favored temperature and moisture regimes of each species. In the worst cases, some species would become extinct or be extirpated from the state if suitable conditions are no longer available (CNRA 2012).

Changes in precipitation patterns and increased temperatures are expected to alter the distribution and character of natural vegetation and associated moisture content of plants and soils. An increase in frequency of extreme heat events and drought are also expected. These changes are expected to lead to increased frequency and intensity of large wildfires (CNRA 2012).

B. Regulatory Setting

Applicable laws and regulations specific to the reduction of GHG emissions are listed in Table 10 below. It should be noted that other laws and regulations described under Energy Demand in this Environmental Setting would also reduce GHG emissions.

Table 10: Applicable Laws and Regulations for Greenhouse Gases

Regulation	Description
Federal	
Mandatory Greenhouse Gas Reporting Rule	On September 22, 2009, EPA issued a final rule for mandatory reporting of GHGs from large GHG emissions sources in the U.S. In general, this national reporting requirement will provide EPA with accurate and timely GHG emissions data from facilities that emit 25,000 metric tons or more of CO_2 per year. This publically available data will allow the reporters to track their own emissions, compare them to similar facilities, and aid in identifying cost effective opportunities to reduce emissions in the future. Reporting is at the facility level, except that certain suppliers of fossil fuels and industrial greenhouse gases along with vehicle and engine manufacturers will report at the corporate level. An estimated 85 percent of the total U.S. GHG emissions, from approximately 10,000 facilities, are covered by this final rule.

Table 10: Applicable Laws and Regulations for Greenhouse Gases	
Regulation	**Description**
National Program to Cut Greenhouse Gas Emissions and Improve Fuel Economy for Cars and Trucks	On September 15, 2009, EPA and the Department of Transportation's National Highway Traffic Safety Administration (NHTSA) proposed a new national program that would reduce GHG emissions and improve fuel efficiency for all new cars and trucks sold in the EPA proposed the first-ever national GHG emissions standards under the CAA, and NHTSA proposed CAFE standards under the Energy Policy and Conservation Act. This proposed national program would allow automobile manufacturers to build a single light-duty national fleet that satisfies all requirements under both Federal programs and the standards of California and other states. The President requested that EPA and NHTSA, on behalf of the Department of Transportation, develop, through notice and comment rulemaking, a coordinated National Program under the CAA and the Energy Policy and Conservation Act (EPCA), as amended by the Energy Independence and Security Act (EISA), to reduce fuel consumption by and GHG emissions of light-duty vehicles for model years 2017-2025. EPA and NHTSA are developing the proposal based on extensive technical analyses, an examination of the factors required under the respective statutes and on discussions with individual motor vehicle manufacturers and other stakeholders. The National Program would apply to passenger cars, light-duty trucks, and medium-duty passenger vehicles (light-duty vehicles) built in those model years (76 FR 48758). The first part of this program (i.e., 2012-2016) is implemented. The next part (i.e., 2017-2025) is currently in process for which ARB is proposed to accept compliance thereof as also being acceptable for California compliance, similar to what was done for the first part.
Endangerment and Cause or Contribute Findings	On December 7, 2009, EPA adopted its Proposed Endangerment and Cause or Contribute Findings for Greenhouse Gases under the CAA (Endangerment Finding). The Endangerment Finding is based on Section 202(a) of the CAA, which states that the Administrator (of EPA) should regulate and develop standards for "emission[s] of air pollution from any class of classes of new motor vehicles or new motor vehicle engines, which in [its] judgment cause, or contribute to, air pollution which may reasonably be anticipated to endanger public health or welfare." The rule addresses Section 202(a) in two distinct findings. The

Table 10: Applicable Laws and Regulations for Greenhouse Gases	
Regulation	**Description**
	first addresses whether or not the concentrations of the six key GHGs (i.e., carbon dioxide [CO_2], methane, nitrous oxide [N_2O], hydrofluorocarbons [HFCs], perfluorocarbons [PFCs], and sulfur hexafluoride [SF_6]) in the atmosphere threaten the public health and welfare of current and future generations. The second addresses whether or not the combined emissions of GHGs from new motor vehicles and motor vehicle engines contribute to atmospheric concentrations of GHGs and therefore the threat of climate change. The Administrator found that atmospheric concentrations of GHGs endanger the public health and welfare within the meaning of Section 202(a) of the CAA. The evidence supporting this finding consists of human activity resulting in "high atmospheric levels" of GHG emissions, which are very likely responsible for increases in average temperatures and other climatic changes. Furthermore, the observed and projected results of climate change (e.g., higher likelihood of heat waves, wild fires, droughts, sea level rise, and higher intensity storms) are a threat to the public health and welfare. Therefore, GHGs were found to endanger the public health and welfare of current and future generations. The Administrator also found that GHG emissions from new motor vehicles and motor vehicle engines are contributing to air pollution, which is endangering public health and welfare. EPA's final findings respond to the 2007 U.S. Supreme Court decision that GHGs fit within the CAA definition of air pollutants. The findings do not in and of themselves impose any emission reduction requirements but rather allow EPA to finalize the GHG standards proposed earlier in 2009 for new light-duty vehicles as part of the joint rulemaking with the Department of Transportation.
Significant New Alternatives Policy	USEPA's Significant New Alternatives Policy (SNAP) program provide an evolving list of alternatives (i.e., chemicals that may replace one that is currently in use for a specific purpose). USEPA makes decisions informed by the overall understanding of the environmental and human health impacts as well as the current knowledge regarding available substitutes. Where USEPA is determining whether to add a new substitute to the list, USEPA compares the risk posed by the new substitute to the risks posed by other alternatives on the list and determines whether that specific new substitutes poses more risk than already-listed alternatives for the same use. Section 612 of the Clean Air Act

Table 10: Applicable Laws and Regulations for Greenhouse Gases	
Regulation	**Description**
	provides that USEPA must prohibit the use of a substitute where it has determined that there are other available substitutes that pose less overall risk to human health and the environment.
State	
Executive Order B-30-15	Executive Order B-30-15 established a California GHG reduction target of 40 percent below 1990 levels by 2030. To accomplish this goal, directs state agencies to take measures consistent with their existing authority to reduce greenhouse gas emissions. In addition, the California Air Resources Board will initiate a public process in the summer of 2015 and work closely with other state agencies to update the State's climate change Scoping Plan. The updated Scoping Plan will provide a framework for achieving the 2030 target and will be completed and adopted by the Air Resources Board in 2016. Concurrent planning efforts related to energy efficiency in existing buildings (AB 758), short-lived climate pollutants, sustainable freight, Greenhouse Gas Reduction Fund Investments, forest health, and others will be coordinated with, and feed into, the updated Scoping Plan.
Executive Order S-3-05	Executive Order S-3-05, which was signed by former Governor Schwarzenegger in 2005, proclaims that California is vulnerable to the impacts of climate change. It declares that increased temperatures could reduce the Sierra's snowpack, further exacerbate California's air quality problems, and potentially cause a rise in sea levels. To combat those concerns, the Executive Order established total greenhouse gas emission targets. Specifically, emissions are to be reduced to the 2000 level by 2010, the 1990 level by 2020, and to 80 percent below the 1990 level by 2050. The Executive Order directed the Secretary of the California Environmental Protection Agency (CalEPA) to coordinate a multi-agency effort to reduce greenhouse gas emissions to the target levels. The Secretary will also submit biannual reports to the governor and state legislature describing: progress made toward reaching the emission targets; impacts of global warming on California's resources; and mitigation and adaptation plans to combat these impacts. To comply with the Executive Order, the Secretary of the Cal/EPA created the Climate Action Team (CAT) made up of members from various state agencies and commission. CAT released its first report in March 2006. The report proposed to achieve the targets by building on voluntary

Table 10: Applicable Laws and Regulations for Greenhouse Gases	
Regulation	**Description**
	actions of California businesses, local government and community actions, as well as through state incentive and regulatory programs.
Clean Energy and Pollution Reduction Act of 2015 (SB 350, Statues of 2015)	The Clean Energy and Pollution Reduction Act of 2015 requires the amount of electricity generated and sold to retail customers per year from eligible renewable energy resources be increased to 50% by December 31, 2030. This act also requires doubling of the energy efficiency savings in electricity and natural gas for retail customers, through energy efficiency and conservation, by December 31, 2030.
Senate Bill 605, Short-Lived Climate Pollutants	Senate Bill 605 directs ARB to complete a comprehensive strategy to reduce emissions of short-lived climate pollutants in the state through the following actions: (1) Complete an inventory of sources and emissions of short-lived climate pollutants in the state based on available data. (2) Identify research needs to address any data gaps. (3) Identify existing and potential new control measures to reduce emissions. (4) Prioritize the development of new measures for short-lived climate pollutants that offer cobenefits by improving water quality or reducing other air pollutants that impact community health and benefit disadvantaged communities, as identified pursuant to Section 39711. (5) Coordinate with other state agencies and districts to develop measures identified as part of the comprehensive strategy.
Assembly Bill 32, the California Global Warming Solutions Act, Statutes of 2006	In September 2006, former Governor Arnold Schwarzenegger signed AB 32, the California Global Warming Solutions Act of 2006. AB 32 establishes regulatory, reporting, and market mechanisms to achieve quantifiable reductions in GHG emissions and a cap on statewide GHG emissions. AB 32 requires that statewide GHG emissions be reduced to 1990 levels by 2020. This reduction will be accomplished through an enforceable statewide cap on GHG emissions that will be phased in starting in 2012. To effectively implement the cap, AB 32 directs ARB to

Table 10: Applicable Laws and Regulations for Greenhouse Gases	
Regulation	**Description**
	develop and implement regulations to reduce statewide GHG emissions from substantial stationary and mobile source categories. Requires ARB to produce a Scoping Plan by 1/1/2009 and at least every 5 years afterwards that details how the state will meet its GHG reduction targets. AB 32 requires that ARB adopt a quantified cap on GHG emissions representing 1990 emissions levels and disclose how it arrives at the cap; institute a schedule to meet the emissions cap; and develop tracking, reporting, and enforcement mechanisms to ensure that the state achieves the reductions in GHG emissions necessary to meet the cap. AB 32 also includes guidance to institute emissions reductions in an economically efficient manner and conditions to ensure that businesses and consumers are not unfairly affected by the reductions.
Assembly Bill 1493, Statutes of 2002	In September 2004, ARB approved regulations to reduce GHG emissions from new motor vehicles. The Board took this action pursuant to Chapter 200, Statutes of 2002 (AB 1493, Pavley) which directed the Board to adopt regulations that achieve the maximum feasible and cost effective reduction in greenhouse gas emissions from motor vehicles. The regulations, which took effect in 2006 following an opportunity for legislative review, apply to new passenger vehicles and light duty trucks beginning with the 2009 model year.
Executive Order S-1-07	Executive Order S-1-07, which was signed by former Governor Schwarzenegger in 2007, proclaims that the transportation sector is the main source of GHG emissions in California, at over 40 percent of statewide emissions. It establishes a goal that the carbon intensity of transportation fuels sold in California should be reduced by a minimum of 10 percent by 2020. This order also directed ARB to determine if this LCFS could be adopted as a discrete early action measure after meeting the mandates in AB 32. ARB adopted the LCFS on April 23, 2009.
Senate Bill 1368, Statutes of 2006	SB 1368 is the companion bill of AB 32 and was signed by former Governor Schwarzenegger in September 2006. SB 1368 requires the CPUC to establish a GHG emission performance standard for baseload generation from investor owned utilities by February 1, 2007. The CEC must establish a similar standard for local publicly owned utilities by June 30, 2007. These standards cannot exceed the GHG emission rate from a baseload combined-cycle natural gas fired plant. The legislation further requires that all electricity

Table 10: Applicable Laws and Regulations for Greenhouse Gases	
Regulation	**Description**
	provided to California, including imported electricity, must be generated from plants that meet the standards set by the CPUC and CEC.
Senate Bill 1078, Statutes of 2002, Senate Bill 107, Statutes of 2006, and SBx1 2	SB 1078 (Chapter 516, Statutes of 2002) requires retail sellers of electricity, including investor-owned utilities and community choice aggregators, to provide at least 20 percent of their supply from renewable sources by 2017. SB 107 (Chapter 464, Statutes of 2006) changed the target date to 2010. In 2010, SBx1 2 was chaptered, which expanded the State's Renewable Portfolio Standard to 33 percent renewable power by 2020.
Senate Bill 97, Statutes of 2007	As directed by SB 97, the Natural Resources Agency adopted Amendments to the CEQA Guidelines for GHG emissions on December 30, 2009. On February 16, 2010, the Office of Administrative Law approved the Amendments, and filed them with the Secretary of State for inclusion in the California Code of Regulations. The Amendments became effective on March 18, 2010.
Senate Bill 375, Statutes of 2008	SB 375, signed in September 2008, aligns regional transportation planning efforts, regional GHG reduction targets, and land use and housing allocation. SB 375 requires Metropolitan Planning Organizations (MPOs) to adopt a Sustainable Communities Strategy (SCS) or Alternative Planning Strategy (APS), which will prescribe land use allocation in that MPO's Regional Transportation Plan (RTP). ARB, in consultation with MPOs, will 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 8 years, but can be updated every 4 years if advancements in emissions technologies affect the reduction strategies to achieve the targets. ARB is also charged with reviewing each MPO's SCS or APS for consistency with its assigned targets. If MPOs do not meet the GHG reduction targets, transportation projects would not be eligible for funding programmed after January 1, 2012. This bill also extends the minimum time period for the Regional Housing Needs Allocation (RNHA) cycle from 5 years to 8 years for local governments located within an MPO that meets certain requirements. City or county land use policies (including general plans) are not required to be consistent with the RTP (and associated SCS or APS). However, new provisions of CEQA

Table 10: Applicable Laws and Regulations for Greenhouse Gases	
Regulation	**Description**
	would incent qualified projects that are consistent with an approved SCS or APS, categorized as “transit priority projects.”
Executive Order S-13-08	Sea level rise is a foreseeable indirect environmental impact associated with climate change, largely attributable to thermal expansion of the oceans and melting polar ice. As discussed above in the environmental setting (subheading “Adaptation to Climate Change”), sea level rise presents impacts to California associated with coastal erosion, water supply, water quality, saline-sensitive species and habitat, land use compatibility, and flooding. Former Governor Arnold Schwarzenegger signed Executive Order S-13-08 on November 14, 2008. This executive order directed the California Natural Resources Agency (CNRA) to develop the 2009 California Climate Adaptation Strategy (CNRA 2009)), which summarizes the best known science on climate change impacts in seven distinct sectors—public health, biodiversity and habitat, ocean and coastal resources, water management, agriculture, forest resources, and transportation and energy infrastructure—and provides recommendations on how to manage against those threats. This executive order also directed OPR, in cooperation with the CNRA, to provide land use planning guidance related to sea level rise and other climate change impacts by May 30, 2009, which is also provided in the 2009 California Climate Adaptation Strategy (CNRA 2009) and OPR continues to further refine land use planning guidance related to climate change impacts. Executive Order S-13-08 also directed CNRA to convene an independent panel to complete the first California Sea Level Rise Assessment Report. This report is to be completed no later than December 1, 2010. The report is intended to provide information on the following: • Relative sea level rise projections specific to California, taking into account issues such as coastal erosion rates, tidal impacts, El Niño and La Niña events, storm surge, and land subsidence rates; • The range of uncertainty in selected sea level rise projections; • A synthesis of existing information on projected sea level rise impacts to state infrastructure (such as

Table 10: Applicable Laws and Regulations for Greenhouse Gases	
Regulation	**Description**
	roads, public facilities and beaches), natural areas, and coastal and marine ecosystems; and • Discussion of future research needs regarding sea level rise for California.
ARB's Landfill Methane Control Measure	The regulation requires owners and operators of certain uncontrolled municipal solid waste landfills to install gas collection and control systems, and requires existing and newly installed gas and control systems to operate in an optimal manner. The regulation allows local air districts to voluntarily enter into agreements with ARB to implement and enforce the regulation and to assess fees to cover costs. Some local air districts have also adopted rules to implement federal standards for the installation of gas collection and control systems.
AB 341 (Chesbro, Chapter 476, Statutes of 2011)	AB 341 (Chesbro, Chapter 476, Statutes of 2011 established a State target to reduce by 75 percent the amount of solid waste sent to landfills by 2020 through recycling, composting, and source reduction practices.
AB 1826 (Chesbro, Chapter 727, Statutes of 2014)	AB 1826 (Chesbro, Chapter 727, Statutes of 2014) requires businesses generating specified amounts of organic wastes to begin arranging for the recycling and diversion of those wastes from landfill disposal beginning in 2016.
Refrigerant Management Plan	The Refrigerant Management Plan requires facilities with refrigeration systems with more than 50 pounds of high-GWP refrigerant to: conduct and report periodic leak inspections; promptly repair leaks; and keep service records on site.
Compliance Offset Protocols under the State's Cap-and-Trade Program	Compliance Offset Protocols under the State's Cap-and-Trade Program include a livestock protocol, rice cultivation protocol, and mine methane capture protocol. The protocols provide methods to quantify, report, and credit GHG emission reductions from sectors not covered by the Cap-and-Trade Program.
Assembly Bill 1257 (Bocanegra, Chapter 749, Statutes of 2013)	AB 1257 directs the CEC to assemble a report by November 2015 (and every four years after), in consultation with other State agencies, to identify strategies for maximizing the benefits obtained from natural gas as an energy source.

Table 10: Applicable Laws and Regulations for Greenhouse Gases	
Regulation	**Description**
Assembly Bill 1900 (Gatto, Chapter 602, Statutes of 2012)	AB 1900 directed the CPUC to adopt natural gas constituent standards (in consultation with ARB and the Office of Environmental Health and Hazard Assessment). The legislation is also designed to streamline and standardize customer pipeline access rules, and encourage the development of statewide policies and programs to promote all sources of biomethane production and distribution.
Low Carbon Fuel Standard	The Low Carbon Fuel Standard (LCFS) requires transportation fuel providers to procure clean fuels to reduce the carbon intensity of California's fuel mix. The LCFS provides a market signal to incentivize using captured methane as a transportation fuel, among other clean fuel options.
Senate Bill 1122 (Rubio, Chapter 612, Statutes 2012)	Senate Bill 1122 directed the California Public Utility Commission (CPUC) to require the State's investor-owned utilities to develop and offer 10 to 20 year market-price contracts to procure an additional 250 megawatts of cumulative electricity generation from biogas facilities that commence operating on or after June of 2013.

9. HAZARDS AND HAZARDOUS MATERIALS

A. Existing Conditions

California Health and Safety Code (Section 25501) defines "hazardous materials" as any material that, because of its quantity, concentration, or physical or chemical characteristics, poses a significant present or potential hazard to human health and safety or to the environment if released into the workplace or the environment. Hazardous materials are grouped into four categories based on their characteristics: toxic (causes human health effects), ignitable (has the ability to burn), corrosive (causes severe burns or damage to materials) and reactive (causes explosions or generates toxic gases). A hazardous waste is any hazardous material that is finished with its intended use and is discarded. This may include items, such as spent fuels, industrial solvents and chemicals, process water, and other spent materials (i.e., some types of batteries and fuel cells). California's hazardous waste regulations provides the following means to determine whether or not a waste is hazardous: (1) a list of criteria (toxic, ignitable, corrosive and reactive) that a waste may exhibit; (2) a list of those wastes that are subject to regulation; and (3) a list of chemical names and common names that are presumed to be hazardous in California. The California Hazardous Waste Control Law

recognizes more than 780 hazardous chemicals and nearly 30 additional common materials that may be hazardous. Naturally occurring asbestos is also often found in a type of rock (serpentine) located in the California Coast Ranges and Sierra foothills.

B. Regulatory Setting

Applicable laws and regulations associated with hazards and hazardous materials are discussed in Table 11.

Table 11: Applicable Laws and Regulations for Hazards and Hazardous Materials

Regulations	Description
Federal	
CWA (40 CFR 112)	The 1972 amendments to the CWA provide the statutory basis for the NPDES permit program and the basic structure for regulating the discharge of pollutants from point sources to waters of the U.S. Section 402 of the CWA specifically required EPA to develop and implement the NPDES program.
Safe Drinking Water Act (SDWA)	SDWA is the main federal law that ensures the quality of Americans' drinking water. Under SDWA, EPA sets standards for drinking water quality and oversees the states, localities, and water suppliers who implement those standards. SDWA was originally passed by Congress in 1974 to protect public health by regulating the nation's public drinking water supply. The law was amended in 1986 and 1996 and requires many actions to protect drinking water and its sources: rivers, lakes, reservoirs, springs, and ground water wells. SDWA does not regulate private wells which serve fewer than 25 individuals.
Federal Hazardous Materials Regulations (FHMR) Title 49, Code of Federal Regulations, Parts 100-180	The regulations establish criteria for the safe transport of hazardous materials. Compliance is mandatory for intrastate and interstate transportation.
Toxic Substances Control Act (TSCA) 15 U.S.C. Section 2601 et seq.	TSCA provides EPA with authority to require reporting, record-keeping and testing requirements, and restrictions relating to chemical substances and/or mixtures. TSCA addresses the production, importation, use, and disposal of specific chemicals including polychlorinated biphenyls (PCBs), asbestos, radon and lead-based paint.
Resource Conservation and Recovery Act (RCRA) 42 U.S.C. Section 6901 et	RCRA of 1976 gives EPA the authority to control hazardous waste from the "cradle-to-grave." This includes the generation, transportation, treatment, storage, and disposal of hazardous waste. RCRA also set forth a framework for the management of non-hazardous solid wastes. The 1986 amendments to RCRA

Table 11: Applicable Laws and Regulations for Hazards and Hazardous Materials	
Regulations	**Description**
seq. (40 CFR)	enabled EPA to address environmental problems that could result from underground tanks storing petroleum and other hazardous substances. HSWA - the Federal Hazardous and Solid Waste Amendments - are the 1984 amendments to RCRA that focused on waste minimization and phasing out land disposal of hazardous waste as well as corrective action for releases. Some of the other mandates of this law include increased enforcement authority for EPA, more stringent hazardous waste management standards, and a comprehensive underground storage tank program. Federal regulations adopted by EPA are found in Title 40, Code of Federal Regulations (40 CFR).
Comprehensive Environmental Response, Compensation and Liability Act (CERCLA)	CERCLA, commonly known as Superfund, was enacted by Congress on December 11, 1980. This law created a tax on the chemical and petroleum industries and provided broad Federal authority to respond directly to releases or threatened releases of hazardous substances that may endanger public health or the environment. CERCLA also enabled the revision of the National Contingency Plan (NCP). The NCP provided the guidelines and procedures needed to respond to releases and threatened releases of hazardous substances, pollutants, or contaminants. The NCP also established the NPL. The Superfund Amendments and Reauthorization Act (SARA) of 1986 reauthorized CERCLA to continue cleanup activities around the country. Several site-specific amendments, definitions clarifications, and technical requirements were added to the legislation, including additional enforcement authorities. Also, Title III of SARA authorized the Emergency Planning and Community Right-to-Know Act (EPCRA).
Emergency Planning and Community Right-to-Know Act (EPCRA) (42 USC Section 9601 et seq.)	The SARA of 1986 created EPCRA (40 CFR Parts 350-372), also known as SARA Title III, a statute designed to improve community access to information about chemical hazards and to facilitate the development of chemical emergency response plans by state/tribe and local governments. EPCRA required the establishment of state/tribe emergency response commissions (SERCs/TERCs), responsible for coordinating certain emergency response activities and for appointing local emergency planning committees.
State	
Hazardous Materials Transportation California Vehicle	Regulations pertaining to the safe transport of hazardous materials are in California Vehicle Code Sections 31301-31309. All motor carriers and drivers involved in transportation of hazardous materials must comply with the requirements

Table 11: Applicable Laws and Regulations for Hazards and Hazardous Materials	
Regulations	**Description**
Code Sections 31301-31309	contained in federal and state regulations, and must apply for and obtain a hazardous materials transportation license from the California Highway Patrol. A driver is required to obtain a hazardous materials endorsement issued by the driver's country or state of domicile to operate any commercial vehicle carrying hazardous materials. The driver is required to display placards or markings while hauling hazardous waste, unless the driver is exempt from the endorsement requirements. A driver who is a California resident is required to obtain an endorsement from California Highway Patrol.
Hazardous Waste Control Law California Health & Safety Code, Division 20, Chapter 6.5, 22 CCR, Division 4.5	California requirements and statutory responsibilities in managing hazardous waste in California – this includes the generation, transportation, storage, treatment, recycling, and disposal of hazardous waste. The statute and regulation are implemented by Cal/EPA Department of Toxic Substances Control.
California Accidental Release Prevention (CalARP) Program 19 CCR Division 2, Chapter 4.5, Sections 2735-2785	The purpose of the CalARP program is to prevent accidental releases of substances that can cause serious harm to the public and the environment, to minimize the damage if releases do occur, and to satisfy community right-to-know laws. This is accomplished by requiring businesses that handle more than a threshold quantity of a regulated substance listed in the regulations to develop a Risk Management Plan (RMP). An RMP is a detailed engineering analysis of the potential accident factors present at a business and the mitigation measures that can be implemented to reduce this accident potential.
Hazardous Material Business Plan & Area Plan Program Health and Safety Code Sections 25500 – 25520 19 CCR, Division 2, Chapter 4, Article 3 & 4	The business and area plans program, relating to the handling and release or threatened release of hazardous materials, was established in California to protect the public health and safety and the environment. Basic information on the location, type, quantity, and the health risks of hazardous materials handled, used, stored, or disposed of in the state, which could be accidently released into the environment, is not now available to firefighters, health officials, planners, public safety officers, health care providers, regulatory agencies, and other interested persons. The information provided by business and area plans is necessary in order to prevent or mitigate the damage to the health and safety of persons and the environment from the release or threatened release of hazardous materials into the workplace and environment. Certified Unified Program Agencies (CUPAs) use information collected from the Business Plan and

Table 11: Applicable Laws and Regulations for Hazards and Hazardous Materials	
Regulations	**Description**
	CalARP programs to identify hazardous materials in their communities. This information provides the basis for the Area Plan and is used to determine the appropriate level of emergency planning necessary to respond to a release.
Unified Program Administration Health and Safety Code, Chapter 6.11, Sections 25404-25404.8 27 CCR, Division 1, Subdivision 4, Chapter 1, Sections 15100-15620	A CUPA, which is authorized by the Secretary of Cal/EPA to carry out several of the hazardous waste/hazardous materials regulatory programs administered by the State in a coordinated and consistent manner. The six hazardous waste and materials program elements covered by the CUPA include: 1) Hazardous Waste Generators 2) Underground Tanks 3) Above Ground Tanks 4) Accidental Release Program 5) Hazardous Material Release Response Plans & Spill Notification 6) Hazardous Materials Management Plans & Inventory Reporting The intent of the CUPA is to simplify the hazardous materials regulatory environment and provide a single point of contact for businesses to address inspection, permitting, billing, and enforcement issues.
Fuels and Fuel Additive Program (40 CFR 79)	EPA regulates diesel fuels under two programs; one is administered under the Office of Pollution Prevention and Toxic Substances (OPPTS) and the other is administered under the Transportation and Air Quality group. The OPPTS requires that all chemicals produced in the U.S. are registered with the Toxic Substances Control Act. The Transportation and Air Quality group requires that any fuels sold for ground transportation purposes must be registered with EPA and the volumes reported on a quarterly basis.
Local	
Various Local Ordinances	Various ordinances and codes may be adopted at the local level to provide stricter requirements in the management of hazardous materials and waste activities within the jurisdiction.

10. HYDROLOGY AND WATER QUALITY

A. Existing Conditions

1. Surface Waters

Surface waters occur as streams, lakes, ponds, coastal waters, lagoons, estuaries, floodplains, dry lakes, desert washes, wetlands and other collection sites. Water bodies modified or developed by man, including reservoirs and aqueducts, are also considered surface waters. Surface water resources are very diverse throughout the state, due to the high variance in tectonics, topography, geology/soils, climate, precipitation, and hydrologic conditions. Overall, California has the most diverse range of watershed conditions in the U.S., with varied climatic regimes ranging from Mediterranean climates with temperate rainforests in the north coast region to desert climates containing dry desert washes and dry lakes in the southern central region.

The average annual runoff for the State is 71 million acre-feet (DWR 2003). The state has more than 60 major stream drainages and more than 1,000 smaller, but significant drainages that drain coastal mountains and inland mountainous areas. High snowpack levels and resultant spring snowmelt yield high surface runoff and peak discharge in the Sierra Nevada and Cascade Mountains that feed surface flows, fill reservoirs and recharge groundwater. Federal, state and local engineered water projects, aqueducts, canals, and reservoirs serve as the primary conduits of surface water sources to areas that have limited surface water resources. Most of the surface water storage is transported for agricultural, urban, and rural residential needs to the San Francisco Bay Area and to cities and areas extending to southern coastal California. Surface water is also transported to southern inland areas, including Owens Valley, Imperial Valley, and Central Valley areas.

2. Groundwater

The majority of runoff from snowmelt and rainfall flows down mountain streams into low gradient valleys and either percolates into the ground or is discharged to the sea. This percolating flow is stored in alluvial groundwater basins that cover approximately 40 percent of the geographic extent of the state (DWR 2003). Groundwater recharge occurs more readily in areas underlain by coarse sediments, primarily in mountain base alluvial fan settings. As a result, the majority of California's groundwater basins are located in broad alluvial valleys flanking mountain ranges, such as the Cascade Range, Coast Ranges, Transverse Ranges, and the Sierra Nevada.

There are 250 major groundwater basins that serve approximately 30 percent of California's urban, agricultural and industrial water needs, especially in southern portion of San Francisco Bay, the Central Valley, greater Los Angeles area, and inland desert areas where surface water is limited. On average, more than 15 million acre-feet of groundwater are extracted each year in the State, of which more than 50 percent is extracted from 36 groundwater basins in the Central Valley.

3. Water Quality

Land uses have a great effect on surface water and groundwater water quality in the State of California. Water quality degradation of surface waters occurs through nonpoint- and point- source discharges of pollutants. Nonpoint source pollution is defined as not having a discrete or discernible source and is generated from land runoff, precipitation, atmospheric deposition, seepage, and hydrologic modification (EPA 1993). Nonpoint-source pollution includes runoff containing pesticides, insecticides, and herbicides from agricultural areas and residential areas; acid drainage from inactive mines; bacteria and nutrients from septic systems and livestock; ROGs and toxic chemicals from urban runoff and industrial discharges; sediment from timber harvesting, poor road construction, improperly managed construction sites, and agricultural areas; and atmospheric deposition and hydromodification. In comparison, point-source pollution is generated from identifiable, confined, and discrete sources, such as a smokestack, sewer, pipe or culvert, or ditch. These pollutant sources are regulated by the EPA and SWRCB through RWQCB. Many of the pollutants discharged from point-sources are the same as for nonpoint-sources, including municipal (bacteria and nutrients), agricultural (pesticides, herbicides, and insecticides), and industrial pollutants (ROGs and other toxic effluent).

B. Regulatory Setting

Applicable laws and regulations associated with hydrology, water quality, and water supply are discussed in Table 12.

Table 12: Applicable Laws and Regulations for Hydrology, Water Quality, and Water Supply

Regulation	Description
Federal	
National Flood Insurance Program (FEMA)	Designated floodplain mapping program, flooding and flood hazard reduction implementation, and federal subsidized flood insurance for residential and commercial property. Administered by the FEMA.
Executive Order 11988	Requires actions to be taken for federal activities to reduce the risks of flood losses, restore and preserve floodplains, and minimize flooding impacts to human health and safety.
CWA	Administered primarily by the EPA. Pertains to water quality standards, state responsibilities, and discharges of waste to waters of the U.S. Sections 303, 401, 402, and 404.
CWA Section 303	Defines water quality standards consisting of: 1) designated beneficial uses of a water, 2) the water quality criteria (or “objectives” in California) necessary to support the uses, and 3) an antidegradation policy that protects existing uses and high water quality. Section 303(d) requires states to identify water quality impairments where conventional control methods will not achieve compliance with the standards, and establish

Table 12: Applicable Laws and Regulations for Hydrology, Water Quality, and Water Supply	
Regulation	**Description**
	Total Maximum Daily Load (TMDL) programs to achieve compliance.
CWA Section 401	State certification system for federal actions which may impose conditions on a project to ensure compliance with water quality standards.
CWA Section 402	Section 402 mandates permits for municipal stormwater discharges, which are regulated under the NPDES General Permit for Municipal Separate Storm Sewer Systems (MS4) (MS4 Permit). Several of the cities and counties issue their own NPDES municipal stormwater permits for the regulations of stormwater discharges. These permits require that controls are implemented to reduce the discharge of pollutants in stormwater discharges to the maximum extent possible, including management practices, control techniques, system design and engineering methods, and other measures as appropriate. As part of permit compliance, these permit holders have created Stormwater Management Plans for their respective locations. These plans outline the requirements for municipal operations, industrial and commercial businesses, construction sites, and planning and land development. These requirements may include multiple measures to control pollutants in stormwater discharge. During implementation of specific projects, applicants will be required to follow the guidance contained in the Stormwater Management Plans as defined by the permit holder in that location.
CWA Section 404	Permit system for dredging or filling activity in waters of the U.S., including wetlands, and administered by USACE.
National Toxics Rule and California Toxics Rule	Applicable receiving water quality criteria promulgated by EPA for priority toxic pollutants consisting generally of trace metals, synthetic organic compounds, and pesticides.
State	
California Water Rights	The SWRCB administers review, assessment, and approval of appropriative (or priority) surface water rights permits/licenses for diversion and storage for beneficial use. Riparian water rights apply to the land and allow diversion of natural flows for beneficial uses without a permit, but users must share the resources equitably during drought. Groundwater management planning is a function of local government. Groundwater use by overlying property owners is not formally regulated, except in cases where the groundwater basin supplies are limited and uses have been adjudicated, or through appropriative

Table 12: Applicable Laws and Regulations for Hydrology, Water Quality, and Water Supply	
Regulation	**Description**
	procedures for groundwater transfers.
Public Trust Doctrine	Body of common law that requires the state to consider additional terms and conditions when issuing or reconsidering appropriative water rights to balance the use of the water for many beneficial uses irrespective of the water rights that have been established. Public trust resources have traditionally included navigation, commerce, and fishing and have expanded over the years to include protection of fish and wildlife, and preservation goals for scientific study, scenic qualities, and open-space uses.
Porter-Cologne Water Quality Control Act and California Water Code (Title 23)	The SWRCB is responsible for statewide water quality policy development and exercises the powers delegated to the State by the federal government under the CWA. Nine RWQCBs adopt and implement water quality control plans (Basin Plans) which designate beneficial uses of surface waters and groundwater aquifers, and establish numeric and narrative water quality objectives for beneficial use protection. RWQCBs issue waste discharge requirements for discharge activities to water and land, require monitoring and maintain reporting programs, and implement enforcement and compliance policies and procedures. Other state agencies with jurisdiction in water quality regulation in California include the Department of Public Health (drinking water regulations), Department of Pesticide Regulation, Department of Toxic Substances Control, CDFW, and the Office of Environmental Health and Hazard Assessment.
Policy for Implementation of Toxics Standards for Inland Surface Waters, Enclosed Bays, and Estuaries of California	Commonly referred to as the State Implementation Policy (or SIP), the SIP provides implementation procedures for discharges of toxic pollutants to receiving waters.
Thermal Plan	The Water Quality Control Plan for Control of Temperature in the Coastal and Interstate Water and Enclosed Bays and Estuaries of California was adopted by the SWRCB in 1972 and amended in 1975. The Thermal Plan restricts discharges of thermal waste or elevated temperature waste to waters of the state. Generally, the Thermal Plan prohibits discharges from increasing ambient temperatures by more than 1ºF over more

Table 12: Applicable Laws and Regulations for Hydrology, Water Quality, and Water Supply	
Regulation	**Description**
	than 25 percent of a stream cross section, increasing ambient temperatures by more than 4ºF in any location, and prohibits discharge of waste that exceeds more than 20ºF above the ambient temperature.
Statewide NPDES General Permit for Stormwater Associated with Land Disturbance and Construction Activity (Order No. 2009-0009-DWQ, NPDES No. CAR000002)	NPDES permit for stormwater and non-storm discharges from construction activity that disturbs greater than 1 acre. The general construction permit requires the preparation of a SWPPP that identifies BMPs to be implemented to control pollution of storm water runoff. The permit specifies minimum construction BMPs based on a risk-level determination of the potential of the project site to contribute to erosion and sediment transport and sensitivity of receiving waters to sediment. While small amounts of construction-related dewatering are covered under the General Construction Permit, the RWQCB has also adopted a General Order for Dewatering and Other Low Threat Discharges to Surface Waters (General Dewatering Permit). This permit applies to various categories of dewatering activities and may apply to some construction sites, if construction of specific projects required dewatering in greater quantities than that allowed by the General Construction Permit and discharged the effluent to surface waters. The General Dewatering Permit contains waste discharge limitations and prohibitions similar to those in the General Construction Permit.
Statewide NPDES General Permit for Discharges of Stormwater Associated with Industrial Facilities (Order No. 97-003-DWQ, NPDES No. CAS000001)	NPDES permit for stormwater and non-storm discharges from types of industrial sites based on the Standard Industrial Classification. The general industrial permit requires the preparation of a SWPPP that identifies potential onsite pollutants, BMPs to be implemented, and inspection/monitoring.
Senate Bill 1168	This bill requires all groundwater basins designated as high- or medium-priority basins by DWR that are designated as basins subject to critical conditions of overdraft to be managed under a groundwater sustainability plan or coordinated groundwater sustainability plans by January 31, 2020, and requires all other groundwater basins designated as high- or medium-priority basins to be managed under a groundwater sustainability plan or coordinated groundwater sustainability plans by January 31,

Table 12: Applicable Laws and Regulations for Hydrology, Water Quality, and Water Supply	
Regulation	**Description**
	2022. This bill would require a groundwater sustainability plan to be developed and implemented to meet the sustainability goal, established as prescribed, and would require the plan to include prescribed components.
Assembly Bill 1739	This bill establishes groundwater reporting requirements for a person extracting groundwater in an area within a basin that is not within the management area of a groundwater sustainability agency or a probationary basin. The bill requires the reports to be submitted to the SWRCB or, in certain areas, to an entity designated as a local agency by the SWRCB.
Senate Bill 1319	This bill allows the SWRCB to designate a groundwater basin as a probationary basin subject to sustainable groundwater management requirements. This bill also authorizes SWRCB to develop an interim management plan in consultation with the DWR under specified conditions.
Local	
Water Agencies	Water agencies enter into contracts or agreements with the federal and state governments to protect the water supply and to ensure the lands within the agency have a dependable supply of suitable quality water to meet present and future needs.
Floodplain Management	General plans guide county land use decisions, and require the identification of water resource protection goals, objectives, and policies. Floodplain management is addressed through ordinances, land use planning, and development design review and approval. Local actions may be coordinated with FEMA for the National Flood Insurance Program. Typical provisions address floodplain use restrictions, flood protection requirement, allowable alteration of floodplains and stream channels, control of fill and grading activities in floodplains, and prevention of flood diversions where flows would increase flood hazards in other areas.
Drainage, Grading, and Erosion Control Ordinances	Counties regulate building activity under the federal Uniform Building Code, local ordinances, and related development design review, approval, and permitting. Local ordinances are common for water quality protection addressing drainage, stormwater management, land grading, and erosion and sedimentation control.
Environmental Health	The RWQCBs generally delegate permit authority to county health departments to regulate the construction and operation/maintenance of on-site sewage disposal systems

Table 12: Applicable Laws and Regulations for Hydrology, Water Quality, and Water Supply	
Regulation	**Description**
	(e.g., septic systems and leach fields, cesspools).

11. LAND USE AND PLANNING

A. Existing Conditions

In California, the State Planning and Zoning Law (California Government Code section 65000 et seq.) provides the primary legal framework that cities and counties must follow in land use planning and controls. Planned land uses are designated in the city or county general plan, which serves as the comprehensive master plan for the community. Also, city and county land use and other related resource policies are defined in the General Plan. The primary land use regulatory tool provided by the California Planning and Zoning Law is the zoning ordinance adopted by each city and county. Planning and Zoning Law requirements are discussed in the regulatory setting below.

When approving land use development, cities and counties must comply with CEQA, which requires that they consider the significant environmental impacts of their actions and the adoption of all feasible mitigation measures to substantially reduce significant impacts, in the event a project causes significant or potentially significant effects on the environment. In some cases, building permits may be ministerial, and therefore exempt from CEQA, but most land use development approval actions by cities and counties require CEQA compliance.

Land use decisions in California are also be governed by state agencies such as the California Coastal Commission, California State Lands Commission, California Department of Parks and Recreation, and others, where the state has land ownership or permitting authority with respect to natural resources or other state interests.

B. Regulatory Setting

Applicable laws and regulations associated with land use and planning are discussed in Table 13.

Table 13: Applicable Laws and Regulations for Land Use and Planning	
Regulation	**Description**
Federal	
FLPMA	FLPMA is the principal law governing how the BLM manages public lands. FLPMA requires the BLM to manage public land resources for multiple use and sustained yield for both present and future generations. Under FLPMA, the BLM is authorized to

Table 13: Applicable Laws and Regulations for Land Use and Planning	
Regulation	**Description**
	grant right-of-ways for generation, transmission, and distribution of electrical energy. Although local agencies do not have jurisdiction over the federal lands managed by the BLM, under FLPMA and the BLM regulations at 43 CFR Part 1600, the BLM must coordinate its planning efforts with state and local planning initiatives. FLPMA defines an Area of Critical Environmental Concern (ACEC) as an area within the public lands where special management attention is required (when such areas are developed or used or where no development is required) to protect and prevent irreparable damage to important historic, cultural, or scenic values, fish and wildlife resources, or other natural systems or processes, or to protect life and safety from natural hazards. The BLM identifies, evaluates, and designates ACECs through its resource management planning process. Allowable management practices and uses, mitigation, and use limitations, if any, are described in the planning document and the concurrent or subsequent ACEC Management Plan. ACECs are considered land use authorization avoidance areas because they are known to contain resource values that could result in denial of applications for land uses that cannot be designed to be compatible with management objectives and prescriptions for the ACEC.
BLM Resource Management Plans	Established by FLPMA, Resource Management Plans are designed to protect present and future land uses and to identify management practices needed to achieve desired conditions within the management area covered by the Resource Management Plans. Management direction is set forth in the Resource Management Plans in the form of goals, objectives, standards, and guidelines. These, in turn, direct management actions, activities, and uses that affect land management, and water, recreation, visual, natural, and cultural resources.
National Forest Management Act (NFMA)	NFMA is the primary statute governing the administration of national forests. The act requires the Secretary of Agriculture to assess forest lands, develop a management program based on multiple-use, sustained-yield principles, and implement a resource management plan for each unit of the National Forest System. Goal 4 of the USFS's National Strategic Plan for the National Forests states that the nation's forests and grasslands play a significant role in meeting America's need for producing and transmitting energy. Unless otherwise restricted, National Forest Service lands are available for energy exploration, development, and infrastructure (e.g., well sites, pipelines, and

Table 13: Applicable Laws and Regulations for Land Use and Planning	
Regulation	**Description**
	transmission lines). However, the emphasis on non-recreational special uses, such as utility corridors, is to authorize the special uses only when they cannot be reasonably accommodated on non-National Forest Service lands.
State	
State Planning and Zoning Law	California Government Code section 65300 et seq. establishes the obligation of cities and counties to adopt and implement general plans. The general plan is a comprehensive, long-term, and general document that describes plans for the physical development of the city or county. The general plan addresses a broad range of topics, including, at a minimum, land use, circulation, housing, conservation, open space, noise, and safety. In addressing these topics, the general plan identifies the goals, objectives, policies, principles, standards, and plan proposals that support the city or county's vision for the area. The general plan is also a long-range document that typically addresses the physical character of an area over a 20-year period. Although the general plan serves as a blueprint for future development and identifies the overall vision for the planning area, it remains general enough to allow for flexibility in the approach taken to achieve the plan's goals.
Subdivision Map Act (Government Code section 66410 et seq.)	In general, land cannot be divided in California without local government approval. The primary goals of the Subdivision Map Act are: (a) to encourage orderly community development by providing for the regulation and control of the design and improvements of the subdivision with a proper consideration of its relation to adjoining areas; (b) to ensure that the areas within the subdivision that are dedicated for public purposes will be properly improved by the subdivider so that they will not become an undue burden on the community; and (c) to protect the public and individual transferees from fraud and exploitation. (61 Ops. Cal.Atty. Gen. 299, 301 [1978]; 77 Ops. Cal.Atty. Gen. 185 [1994]). Dividing land for sale, lease or financing is regulated by local ordinances based on the state Subdivision Map Act (Government Code section 66410 et seq.).
Local	
General Plans	The most comprehensive land use planning is provided by city and county general plans, which local governments are required by State law to prepare as a guide for future development. The general plan contains goals and policies concerning topics that are mandated by state law or which the jurisdiction has chosen to include. Required topics are: land use, circulation, housing,

Table 13: Applicable Laws and Regulations for Land Use and Planning	
Regulation	**Description**
	conservation, open space, noise, and safety. Other topics that local governments frequently choose to address are public facilities, parks and recreation, community design, or growth management, among others. City and county general plans must be consistent with each other. County general plans must cover areas not included by city general plans (i.e., unincorporated areas).
Specific and Community Plans	A city or county may also provide land use planning by developing community or specific plans for smaller, more specific areas within their jurisdiction. These more localized plans provide for focused guidance for developing a specific area, with development standards tailored to the area, as well as systematic implementation of the general plan. Specific and community plans are required to be consistent with the city or county's general plan.
Zoning	The city or county zoning code is the set of detailed requirements that implement the general plan policies at the level of the individual parcel. The zoning code presents standards for different uses and identifies which uses are allowed in the various zoning districts of the jurisdiction. Since 1971, state law has required the city or county zoning code to be consistent with the jurisdiction's general plan, except in charter cities.

12. MINERAL RESOURCES

A. Existing Conditions

The CGS classifies the regional significance of mineral resources in accordance with the California Surface Mining and Reclamation Act of 1975 and assists in the designation of land containing significant aggregate resources. Mineral Resources Zones (MRZs) have been designated to indicate the significance of mineral deposits. The MRZ categories follow:

MRZ-1: Areas where adequate information indicates that no significant mineral deposits are present or where it is judged that little likelihood exists for their presence.

MRZ-2: Areas where adequate information indicates significant mineral deposits are present, or where it is judged that a high likelihood exists for their presence.

MRZ-3: Areas containing mineral deposits the significance of which cannot be evaluated from available data.

MRZ-4: Areas where available information is inadequate for assignment to any other MRZ.

California ranks as 7th in the U.S. for non-fuel mineral production, accounting for approximately 3.9 percent of the nation's total. In 2011, there were approximately 700 active mineral mines that produced: sand and gravel, boron, Portland cement, crushed stone, gold, masonry cement, clays, gemstones, gypsum, salt, silver, and other minerals (Clinkenbeard and Smith 2013).

B. Regulatory Setting

Applicable laws and regulations associated with mineral resources are discussed in Table 14.

Table 14: Applicable Laws and Regulations for Mineral Resources

Regulation	Description
Federal	
Mining and Mineral Policy Act	The Mining and Mineral Act of 1970 declared that the Federal Government policy is to encourage private enterprise in the development of a sound and stable domestic mineral industry, domestic mineral deposits, minerals research, and methods for reclamation in the minerals industry.
State	
Surface Mining and Reclamation Act (SMARA)	The intent of SMARA of 1975 is to promote production and conservation of mineral resources, minimize environmental effects of mining, and to assure that mined lands will be reclaimed to conditions suitable for alternative uses. An important part of the SMARA legislation requires the State Geologist to classify land according to the presence or absence of significant mineral deposits. Local jurisdictions are given the authority to permit or restrict mining operations, adhering to the SMARA legislation. Classification of an area using MRZs to designate lands that contain mineral deposits are designed to protect mineral deposits from encroaching urbanization and land uses that are incompatible with mining. The MRZ classifications reflect varying degrees of mineral significance, determined by available knowledge of the presence or absence of mineral deposits as well as the economic potential of the deposits.
CBSC (24 CCR)	California's minimum standards for structural design and construction are given in the CBSC (24 CCR). The CBSC is based on the Uniform Building Code (International Code Council 1997), which is used widely throughout U.S. (generally adopted on a state-by-state or district-by-district basis) and has been modified for California conditions with numerous, more detailed or more stringent regulations. The CBSC provides standards for

Table 14: Applicable Laws and Regulations for Mineral Resources	
Regulation	**Description**
	various aspects of construction, including (i.e., not limited to) excavation, grading, and earthwork construction; fills and embankments; expansive soils; foundation investigations; and liquefaction potential and soil strength loss. In accordance with California law, proponents of specific projects would be required to comply with all provisions of the CBSC for certain aspects of design and construction.
Local	
Local Grading and Erosion Control Ordinances	Many counties and cities have grading and erosion control ordinances. These ordinances are intended to control erosion and sedimentation caused by construction activities. A grading permit is typically required for construction-related projects. As part of the permit, project applicants usually must submit a grading and erosion control plan, vicinity and site maps, and other supplemental information. Standard conditions in the grading permit include a description of BMPs similar to those contained in a SWPPP.
City/County General Plans	Most city and county general plans have an element that addresses mineral resources within that jurisdiction.

13. NOISE

A. Existing Conditions

Acoustics is the scientific study that evaluates perception, propagation, absorption, and reflection of sound waves. Sound is a mechanical form of radiant energy, transmitted by a pressure wave through a solid, liquid, or gaseous medium. Sound that is loud, disagreeable, unexpected, or unwanted is generally defined as noise. Common sources of environmental noise and noise levels are presented in Table 15.

Table 15: Typical Noise Levels		
Common Outdoor Activities	**Noise Level (dB)**	**Common Indoor Activities**
	110	Rock band
Jet flyover at 1,000 feet	100	--
Gas lawnmower at 3 feet	90	--
Diesel truck moving at 50 mph at 50 feet	80	Food blender at 3 feet, Garbage disposal at 3 feet
Noisy urban area, Gas	70	Vacuum cleaner at 10 feet, Normal

Table 15: Typical Noise Levels		
Common Outdoor Activities	**Noise Level (dB)**	**Common Indoor Activities**
lawnmower at 100 feet		speech at 3 feet
Commercial area, Heavy traffic at 300 feet	60	
Quiet urban daytime	50	Large business office, Dishwasher in next room
Quiet urban nighttime	40	Theater, Large conference room (background)
Quiet suburban nighttime	30	Library, Bedroom at night, Concert hall (background)
Quiet rural nighttime	20	Broadcast/Recording Studio
	10	--
Threshold of Human Hearing	0	Threshold of Human Hearing
Notes: dB=A-weighted decibels; mph=miles per hour Source: Caltrans 2009: p.2-21		

1. Sound Properties

A sound wave is initiated in a medium by a vibrating object (e.g., vocal chords, the string of a guitar, the diaphragm of a radio speaker). The wave consists of minute variations in pressure, oscillating above and below the ambient atmospheric pressure. The number of pressure variation cycles occurring per second is referred to as the frequency of the sound wave and is expressed in hertz.

Directly measuring sound pressure fluctuations would require the use of a very large and cumbersome range of numbers. To avoid this and have a more useable numbering system, the decibel (dB) scale was introduced. A sound level expressed in decibels is the logarithmic ratio of two like pressure quantities, with one pressure quantity being a reference sound pressure. For sound pressure in air the standard reference quantity is generally considered to be 20 micropascals, which directly corresponds to the threshold of human hearing. The use of the decibel is a convenient way to handle the million-fold range of sound pressures to which the human ear is sensitive. A decibel is logarithmic; it does not follow normal algebraic methods and cannot be directly summed. For example, a 65 dB source of sound, such as a truck, when joined by another 65 dB source results in a sound amplitude of 68 dB, not 130 dB (i.e., doubling the source strength increases the sound pressure by 3 dB). A sound level increase of 10 dB corresponds to 10 times the acoustical energy, and an increase of 20 dB equates to a 100 fold increase in acoustical energy.

The loudness of sound perceived by the human ear depends primarily on the overall sound pressure level and frequency content of the sound source. The human ear is not equally sensitive to loudness at all frequencies in the audible spectrum. To better relate overall sound levels and loudness to human perception, frequency-dependent weighting networks were developed. The standard weighting networks are identified as A through E. There is a strong correlation between the way humans perceive sound and A-weighted sound levels (dBA). For this reason the dBA can be used to predict community response to noise from the environment, including noise from transportation and stationary sources. Sound levels expressed as dB in this section are A-weighted sound levels, unless noted otherwise.

Noise can be generated by a number of sources, including mobile sources (i.e., transportation) such as automobiles, trucks, and airplanes and stationary sources (i.e., non-transportation) such as construction sites, machinery, and commercial and industrial operations. As acoustic energy spreads through the atmosphere from the source to the receiver, noise levels attenuate (i.e., decrease) depending on ground absorption characteristics, atmospheric conditions, and the presence of physical barriers. Noise generated from mobile sources generally attenuate at a rate of 4.5 dB per doubling of distance. Stationary noise sources spread with more spherical dispersion patterns that attenuate at a rate of 6 to 7.5 dB per doubling of distance.

Atmospheric conditions such as wind speed, turbulence, temperature gradients, and humidity may additionally alter the propagation of noise and affect levels at a receiver. Furthermore, the presence of a large object (e.g., barrier, topographic features, and intervening building façades) between the source and the receptor can provide significant attenuation of noise levels at the receiver. The amount of noise level reduction (i.e., shielding) provided by a barrier primarily depends on the size of the barrier, the location of the barrier in relation to the source and receivers, and the frequency spectra of the noise. Natural (e.g., berms, hills, and dense vegetation) and human-made features (e.g., buildings and walls) may be used as noise barriers.

All buildings provide some exterior-to-interior noise reduction. A building constructed with a wood frame and a stucco or wood sheathing exterior typically provides a minimum exterior-to-interior noise reduction of 25 dB with its windows closed, whereas a building constructed of a steel or concrete frame, a curtain wall or masonry exterior wall, and fixed plate glass windows of one-quarter-inch thickness typically provides an exterior-to-interior noise reduction of 30–40 dB with its windows closed (Paul S. Veneklasen & Associates 1973, cited in Caltrans 2002: p. 7-37).

2. Common Noise Descriptors

The intensity of environmental noise fluctuates over time, and several different descriptors of time-averaged noise levels are used. The selection of a proper noise descriptor for a specific source depends on the spatial and temporal distribution,

duration, and fluctuation of both the noise source and the environment. The noise descriptors most often in relation to the environment are defined below (Caltrans 2009).

Equivalent Noise Level (L_{eq}): The equivalent steady-state noise level in a stated period of time that would contain the same acoustic energy as the time-varying noise level during the same period (i.e., average noise level).

Maximum Noise Level (L_{max}): The highest instantaneous noise level during a specified time period.

Minimum Noise Level (L_{min}): The lowest instantaneous noise level during a specified time period.

Day-Night Noise Level (L_{dn}): The 24-hour L_{eq} with a 10-dB penalty applied during the noise-sensitive hours from 10 p.m. to 7 a.m., which are typically reserved for sleeping.

Community Noise Equivalent Level (CNEL): Similar to the L_{dn} described above with an additional 5-dB penalty applied during the noise-sensitive hours from 7 p.m. to 10 p.m., which are typically reserved for relaxation, conversation, reading, and watching television.

Community noise is commonly described in terms of the ambient noise level, which is defined as the all-encompassing noise level associated with a given noise environment. A common statistical tool to measure the ambient noise level is the L_{eq} descriptor listed above, which corresponds to a steady-state A-weighted sound level containing the same total energy as a time-varying signal over a given time period (usually one hour). The L_{eq} is the foundation of the composite noise descriptors such as L_{dn} and CNEL, as defined above, and shows very good correlation with community response to noise.

3. Effects of Noise on Humans

Excessive and chronic exposure to elevated noise levels can result in auditory and non-auditory effects on humans. Auditory effects of noise on people are those related to temporary or permanent hearing loss caused by loud noises. Non-auditory effects of exposure to elevated noise levels are those related to behavioral and physiological effects. The non-auditory behavioral effects of noise on humans are associated primarily with the subjective effects of annoyance, nuisance, and dissatisfaction, which lead to interference with activities such as communications, sleep, and learning. The non-auditory physiological health effects of noise on humans have been the subject of considerable research attempting to discover correlations between exposure to elevated noise levels and health problems, such as hypertension and cardiovascular disease. The mass of research infers that noise-related health issues are predominantly the result of behavioral stressors and not a direct noise-induced response. The extent to which noise contributes to non-auditory health effects remains a subject of considerable research, with no definitive conclusions.

The degree to which noise results in annoyance and interference is highly subjective and may be influenced by several non-acoustic factors. The number and effect of these non-acoustic environmental and physical factors vary depending on individual characteristics of the noise environment such as sensitivity, level of activity, location, time of day, and length of exposure. One key aspect in the prediction of human response to new noise environments is the individual level of adaptation to an existing noise environment. The greater the change in the noise levels that are attributed to a new noise source, relative to the environment an individual has become accustom to, the less tolerable the new noise source will be perceived.

With respect to how humans perceive and react to changes in noise levels, a 1 dB increase is imperceptible, a 3 dB increase is barely perceptible, a 6 dB increase is clearly noticeable, and a 10 dB increase is subjectively perceived as approximately twice as loud (Egan 2007: p. 21). These subjective reactions to changes in noise levels was developed on the basis of test subjects' reactions to changes in the levels of steady-state pure tones or broad-band noise and to changes in levels of a given noise source. It is probably most applicable to noise levels in the range of 50 to 70 dB, as this is the usual range of voice and interior noise levels. For these reasons, a noise level increase of 3 dB or more is typically considered substantial in terms of the degradation of the existing noise environment.

Negative effects of noise exposure include physical damage to the human auditory system, interference, and disease. Exposure to noise may result in physical damage to the auditory system, which may lead to gradual or traumatic hearing loss. Gradual hearing loss is caused by sustained exposure to moderately high noise levels over a period of time; traumatic hearing loss is caused by sudden exposure to extremely high noise levels over a short period. Gradual and traumatic hearing loss both may result in permanent hearing damage. In addition, noise may interfere with or interrupt sleep, relaxation, recreation, and communication. Although most interference may be classified as annoying, the inability to hear a warning signal may be considered dangerous. Noise may also be a contributor to diseases associated with stress, such as hypertension, anxiety, and heart disease. The degree to which noise contributes to such diseases depends on the frequency, bandwidth, and level of the noise, and the exposure time (Caltrans 2009).

4. Vibration

Vibration is the periodic oscillation of a medium or object with respect to a given reference point. Sources of vibration include natural phenomena (e.g., earthquakes, volcanic eruptions, sea waves, landslides) and those introduced by human activity (e.g., explosions, machinery, traffic, trains, construction equipment). Vibration sources may be continuous, (e.g., operating factory machinery or transient in nature, explosions). Vibration levels can be depicted in terms of amplitude and frequency, relative to displacement, velocity, or acceleration.

Vibration amplitudes are commonly expressed in peak particle velocity (PPV) or root-mean-square (RMS) vibration velocity. PPV is defined as the maximum instantaneous positive or negative peak of a vibration signal. PPV is typically used in the monitoring of transient and impact vibration and has been found to correlate well to the stresses experienced by buildings (FTA 2006, Caltrans 2004). PPV and RMS vibration velocity are normally described in inches per second (in/sec).

Although PPV is appropriate for evaluating the potential for building damage, it is not always suitable for evaluating human response. It takes some time for the human body to respond to vibration signals. In a sense, the human body responds to average vibration amplitude. The RMS of a signal is the average of the squared amplitude of the signal, typically calculated over a 1-second period. As with airborne sound, the RMS velocity is often expressed in decibel notation as vibration decibels (VdB), which serves to compress the range of numbers required to describe vibration (FTA 2006). This is based on a reference value of 1micro (μ) inch/second.

The typical background vibration-velocity level in residential areas is approximately 50 VdB. Groundborne vibration is normally perceptible to humans at approximately 65 VdB. For most people, a vibration-velocity level of 75 VdB is the approximate dividing line between barely perceptible and distinctly perceptible levels (FTA 2006).

Typical outdoor sources of perceptible groundborne vibration are construction equipment, steel-wheeled trains, and traffic on rough roads. If a roadway is smooth, the groundborne vibration is rarely perceptible. The range of interest is from approximately 50 VdB, which is the typical background vibration-velocity level, to 100 VdB, which is the general threshold where minor damage can occur in fragile buildings. Construction activities could generate groundborne vibrations that potentially pose a risk to nearby structures. Constant or transient vibrations can weaken structures, crack facades, and disturb occupants (FTA 2006).

Construction vibrations can be transient, random, or continuous. Transient construction vibrations are generated by blasting, impact pile driving, and wrecking balls. Continuous vibrations result from vibratory pile drivers, large pumps, and compressors. Random vibration can result from jackhammers, pavement breakers, and heavy construction equipment. Table 16 describes the general human response to different levels of groundborne vibration-velocity levels.

Table 16: Human Response to Different Levels of Groundborne Noise and Vibration

Vibration-Velocity Level	Human Reaction
65 VdB	Approximate threshold of perception.
75 VdB	Approximate dividing line between barely perceptible and distinctly perceptible. Many people find that transportation-related vibration at this level is unacceptable.

Table 16: Human Response to Different Levels of Groundborne Noise and Vibration	
Vibration-Velocity Level	**Human Reaction**
85 VdB	Vibration acceptable only if there are an infrequent number of events per day.

Notes: VdB = vibration decibels referenced to 1 μ inch/second and based on the root mean square (RMS) velocity amplitude.
Source: FTA 2006: p. 7-8

5. Sensitive Land Uses

Noise-sensitive land uses are generally considered to include those uses where noise exposure could result in health-related risks to individuals, as well as places where quiet is an essential element of their intended purpose. Residential dwellings are of primary concern because of the potential for increased and prolonged exposure of individuals to both interior and exterior noise levels. Additional land uses such as parks, schools, historic sites, cemeteries, and recreation areas are also generally considered sensitive to increases in exterior noise levels. Places of worship and transit lodging, and other places where low interior noise levels are essential are also considered noise-sensitive. These types of receptors are also considered vibration-sensitive land uses in addition to commercial and industrial buildings where vibration would interfere with operations within the building, including levels that may be well below those associated with human annoyance.

B. Regulatory Setting

Applicable laws and regulations associated with noise are discussed in Table 17.

Table 17: Applicable Laws and Regulations for Noise	
Regulation	**Description**
Federal	
Federal Noise Control Act (1972) EPA (40 CFR 201-211)	This act established a requirement that all federal agencies administer their programs to promote an environment free of noise that jeopardizes public health or welfare. EPA was given the responsibility for providing information to the public regarding identifiable effects of noise on public health or welfare, publishing information on the levels of environmental noise that will protect the public health and welfare with an adequate margin of safety, coordinating federal research and activities related to noise control, and establishing federal noise emission standards for selected products distributed in interstate commerce. This act also directed that all federal agencies comply with applicable federal, state, interstate, and

Table 17: Applicable Laws and Regulations for Noise	
Regulation	**Description**
	local noise control regulations.
Quiet Communities Act (1978)	This act promotes the development of effective state and local noise control programs, to provide funds for noise research, and to produce and disseminate educational materials to the public on the harmful effects of noise and ways to effectively control it.
14 CFR, Part 150 (FAA)	These address airport noise compatibility planning and include a system for measuring airport noise impacts and present guidelines for identifying incompatible land uses. All land uses are considered compatible with noise levels of less than 65 dBA L_{dn}. At higher noise levels, selected land uses are also deemed acceptable, depending on the nature of the use and the degree of structural noise attenuation provided.
International Standards and Recommended Practices (International Civil Aviation Organization)	This contains policies and procedures for considering environmental impacts (e.g., aircraft noise emission standards and atmospheric sound attenuation factors).
32 CFR, Part 256 (Department of Defense Air Installations Compatible Use Zones [AICUZ] Program)	AICUZ plans prepared for individual airfields are primarily intended as recommendations to local communities regarding the importance of maintaining land uses which are compatible with the noise and safety impacts of military aircraft operations.
23 CFR, Part 772, Federal Highway Administration (FHWA) standards, policies, and procedures	FHWA standards, policies, and procedures provide procedures for noise studies and noise abatement measures to help protect the public health and welfare, to supply noise abatement criteria, and to establish requirements for information to be given to local officials for use in the planning and design of highways.
29 CFR, Part 1910, Section 1910.95 (U.S. Department of Labor Occupational Safety and Health Administration [OSHA])	This regulation established a standard for noise exposure in the workplace.
FTA Guidance	This guidance presents procedures for predicting and assessing noise and vibration impacts of proposed mass transit projects. All types of bus and rail projects are covered. Procedures for

Table 17: Applicable Laws and Regulations for Noise	
Regulation	**Description**
	assessing noise and vibration impacts are provided for different stages of project development, from early planning before mode and alignment have been selected through preliminary engineering and final design. Both for noise and vibration, there are three levels of analysis described. The framework acts as a screening process, reserving detailed analysis for projects with the greatest potential for impacts while allowing a simpler process for projects with little or no effects. This guidance contains noise and vibration impact criteria that are used to assess the magnitude of predicted impacts. A range of mitigation is described for dealing with adverse noise and vibration impacts.
49 CFR 210 (Federal Rail Administration [FRA] Railroad Noise Emission Compliance Standards) and FRA Guidance (2005)	This section and guidance provides contains criteria and procedures for use in analyzing the potential noise and vibration impacts of various types of high-speed fixed guideway transportation systems.
State	
CPUC Section 21670	The State Aeronautics Act of the CPUC establishes statewide requirements for airport land use compatibility planning and requires nearly every county to create an Airport Land Use Commission or other alternative.
Section 5000 et seq. (21 CCR Division 2.5, Chapter 6), California Airport Noise Regulations promulgated in accordance with the State Aeronautics Act	In Section 5006, the regulations state that: “The level of noise acceptable to a reasonable person residing in the vicinity of an airport is established as a CNEL value of 65 dBA for purposes of these regulations. This criterion level has been chosen for reasonable persons residing in urban residential areas where houses are of typical California construction and may have windows partially open. It has been selected with reference to speech, sleep, and community reaction.
24 CCR, Part 2	These establish standards governing interior noise levels that apply to all new single-family and multi-family residential units in California. These standards require that acoustical studies be performed before construction at building locations where the existing L_{dn} exceeds 60 dBA. Such acoustical studies are required to establish mitigation that will limit maximum Ldn

Table 17: Applicable Laws and Regulations for Noise	
Regulation	**Description**
	levels to 45 dBA in any habitable room.

14. EMPLOYMENT, POPULATION, AND HOUSING

A. Existing Conditions

a) Population

The estimated population of California in 2015 was estimated to be approximately 38,897,000 (DOF 2014). Since California became a state in 1850, the population has been increasing rapidly. Within the first 150 years of California's statehood, the population increased from fewer than 100,000 citizens to approximately 37 million in 2000 (DOF 2013). It is expected that the population of California will reach approximately 44 million in 2030 and approximately 50 million in 2050 (DOF 2013).

b) Housing

As population within the state increases, housing distribution and household conditions are expected to evolve. Estimated housing units, households, and vacancy rates for the State of California in 2013 are shown below in Table 18. Data was derived from the 2010 Census (US Census Bureau 20145).

Table 18: California Housing Profile	
Housing units, 2014	13,900,766
Homeownership rate, 2009-2013	55.3 percent
Households, 2009-2013	12,542,460
Persons per Household, 2009-2013	2.94
Housing units in Multi-units structures, 2009-2013	31 percent
Source: US Census 2014	

c) Employment

In mid-2015, the civilian labor force in California was approximately 19,043,000. Of this labor force, approximately 17,484,000 people were employed and 1,195,000 were considered unemployed. The number of and the unemployment rate decreased steadily decreased in 2015 from 7.0 percent in January to 6.3 percent in June (DOF 2015).

B. Regulatory Setting

See land use planning and housing-related regulations in Section 11.0, Land Use and Planning.

15. PUBLIC SERVICES

A. Existing Conditions

1. Law Enforcement

Enforcement of environmental laws in California is the responsibility of the Attorney General's Office and the CalEPA. The Attorney General represents the people of California in civil and criminal matters before trial courts, appellate courts and the supreme courts of California and the U.S. In regards to environmental issues, the Attorney General enforces laws that safeguard the environment and natural resources in the state. Recent actions by the Attorney General related to air quality and climate change issues include: legally defending the state's clean cars law against multiple challenges, filing numerous actions against the Bush Administration regarding regulation of global warming pollution, working with local governments to ensure that land use planning processes take account of global warming, promoting renewable energy and enhanced energy efficiency in California, and working with other state leaders and agencies to implement AB 32, the Global Warming Solutions Act of 2006.

CalEPA was created in 1991 by Governor's Executive Order. CalEPA's mission is to restore, protect and enhance the environment, to ensure public health, environmental quality and economic vitality. The CalEPA is comprised of various boards, departments and offices, including: ARB, Department of Pesticide Regulation, DTSC, Office of Environmental Health Hazard Assessment, and SWRCB (including the nine RWQCBs).

California's environmental laws are enforced by state and local agencies, each charged with enforcing the laws governing a specific media such as air, water, hazardous waste, solid waste, and pesticides. Enforcement agencies for these media are as follows:

- Air: ARB (part of CalEPA) and Local Air Districts.
- Water: SWRCB (part of CalEPA), RWQCBs (part of CalEPA), local waste water officials, and the California Department of Public Health.
- Hazardous Waste: DTSC (part of CalEPA) and CUPA.
- Carcinogens/Reproductive Toxins: Prop. 65 through the Office of Environmental Health Hazard Assessment (part of CalEPA).
- Pesticides: Department of Pesticide Regulation (part of CalEPA) and County Agricultural Commissioners

Statewide law enforcement service is provided by the California Highway Patrol, which is responsible for protecting State resources and providing crime prevention services and traffic enforcement along the State's highways and byways.

Community law enforcement service is provided by local police and sheriff agencies (i.e., cities and counties, respectively) to prevent crime, respond to emergency incidents, and provide traffic enforcement on local roadways.

2. Fire Protection and Emergency Medical Response Services

State-level fire protection and emergency response service is provided by the California Department of Forestry and Fire Protection (CAL FIRE), primarily in rural areas of the State. CAL FIRE is an emergency response and resource protection department. CAL FIRE protects lives, property and natural resources from fire, responds to emergencies of all types, and protects and preserves timberlands, wildlands, and urban forests.

Local and urban fire protection service is provided by local fire districts and/or local agencies (e.g., fire departments of cities and counties). In addition to providing fire response services most fire agencies also provide emergency medical response services (i.e., ambulance services) within their service areas.

3. Schools

Statewide, the regulation of education for youth is provided by the California Department of Education. The State Board of Education (SBE) is the governing and policy-making body of the California Department of Education. The SBE sets K-12 education policy in the areas of standards, instructional materials, assessment, and accountability. Locally, school districts are responsible for the management and development of elementary, middle, and high-school facilities.

B. Regulatory Setting

Applicable laws and regulations associated with public services are discussed in Table 19.

Table 19: Applicable Laws and Regulations for Public Services

Regulation	Description
Federal	**None applicable.**
American with Disabilities Act	Guidelines to ensure that facilities are accessible to individuals with disabilities. Implements requirements for the design and construction of buildings.
State	
State Fire Responsibility	Areas delineated by the CAL FIRE for which the state assumes primary financial responsibility for protecting natural resources

Table 19: Applicable Laws and Regulations for Public Services	
Regulation	**Description**
Areas	from damages of fire. Local jurisdictions are required to adopt minimum recommended requirements for road design, road identification, emergency fire suppression and fuel breaks and greenbelts. All projects within or adjacent to a State Fire Responsibility Area must meet these requirements.
State School Funding	Education Code Section 17620 authorizes school districts to levy a fee, charge, dedication, or other requirement for any development project for the construction or reconstruction of school facilities.

16. RECREATION

A. Existing Conditions

California contains 118 state parks, nine state recreation areas, 8 state forests, as well as numerous reserve, wildlife areas, and fish hatcheries. General plans for State parks, recreation areas, and beaches are publicly available. The California Outdoor Recreation Plan and associated research provide policy guidance to all public agencies – federal, state, local, and special districts that oversee outdoor recreation on lands, facilities and services throughout California. Agencies and departments that have involvement in recreational activities include Boating and Waterways, Fish and Wildlife, Tahoe Regional Planning Association, various conservancies, and others (California State Parks 2008).

Recreational lands and facilities are also managed by regional and local park and recreation agencies and open space districts. City and county general plans contain recreation elements that provide framework for planning agencies to consider when projects are developed and implemented.

B. Regulatory Setting

Applicable laws and regulations associated with recreation are discussed in Table 20.

Table 20: Applicable Laws and Regulations for Recreation	
Regulation	**Description**
Federal	
FLPMA, 1976 – 43 CFR 1600	Establishes public land policy; guidelines for administration; and provides for the “multiple use” management, protection, development, and enhancement of public lands. Multiple use management, defined as “management of the public lands and their various resource values so that they are utilized in the combination that will best meet the present and future needs of

Table 20: Applicable Laws and Regulations for Recreation	
Regulation	**Description**
	the American people" with recreation identified as one of the resource values.
State	
	None applicable
Local	
General Plans	General plans for cities and counties contain designations for recreational areas. These are policy documents with planned land use maps and related information that are designed to give long-range guidance to those local officials making decisions affecting the growth and resources of their jurisdictions. Because of the number and variety of general plans and related local plans, they are not listed individually.

17. TRANSPORTATION, TRAFFIC, AND SHIPPING

A. Existing Conditions

Existing roadway systems in the U.S. and California generally consist of highways, freeways, arterials, local streets, and intersections/ramps. The existing average annual daily traffic (AADT) volumes on the roadway segments that comprise these systems vary considerably (i.e., from hundreds to hundreds of thousands). The level of service (LOS), a scale used to determine the operating quality of a roadway segment or intersection based on volume-to-capacity ratio (V/C) or average delay, also vary from LOS A, the best and smoothest operating conditions, to LOS F, most congested operating conditions. Other roadway and traffic volume characteristics such as roadway length, number of lanes and facility type (e.g., two-lane freeway), right-of-way width and pavement width, terrain classification (e.g., flat), percent of heavy-duty truck traffic, and accident rates (e.g., number of accidents per million vehicle miles traveled) also vary substantially depending on the location. In addition to the roadway systems, circulation networks provide additional transportation opportunities and include mass transit, airports, and non-motorized travel (e.g., pedestrian and bicycle paths).

B. Regulatory Setting

Applicable laws and regulations associated with transportation and traffic are discussed in Table 21.

Table 21: Applicable Laws and Regulations for Transportation and Traffic	
Regulation	**Description**
Federal	
40 CFR, Part 77 (FAA)	Requires a determination of no hazard to air navigation for structures that will be more than

Table 21: Applicable Laws and Regulations for Transportation and Traffic	
Regulation	**Description**
	200 feet above ground level.
State	
California Vehicle Code (VC) Sections 353; 2500-2505; 31303-31309; 32000-32053; 32100-32109; 31600-31620; California Health and Safety Code Section 25160 et seq.	Regulates the highway transport of hazardous materials.
VC Sections 13369; 15275 and 15278	Addresses the licensing of drivers and the classification of licenses required for the operation of particular types of vehicles and also requires certificates permitting operation of vehicles transporting hazardous materials.
VC Sections 35100 et seq.; 35250 et seq.; 35400 et seq.	Specifies limits for vehicle width, height, and length.
VC Section 35780	Requires permits for any load exceeding Caltrans weight, length, or width standards on public roadways.
California Streets and Highways Code Section 117, 660-672	Requires permits for any load exceeding Caltrans weight, length, or width standards on County roads.
California Streets and Highways Code Sections 117, 660-670, 1450, 1460 et seq., and 1480 et seq.	Regulate permits from Caltrans for any roadway encroachment from facilities that require construction, maintenance, or repairs on or across State highways and County roads.

18. UTILITIES AND SERVICE SYSTEMS

A. Existing Conditions

a) Water Supply and Distribution

The principal water supply facilities in California are operated by the USBR and DWR. In California, the Mid-Pacific Region of the USBR is responsible for the management of the Central Valley Project (CVP). The CVP serves farms, homes, and industry in California's Central Valley as well as the major urban centers in the San Francisco Bay Area. The CVP consists of 20 dams and reservoirs, 11 power plants, and 500 miles of major canals and reaches from the Cascade Mountains near Redding in the north to the Tehachapi Mountains near Bakersfield in the south. In addition to delivering water for municipal and industrial uses and the environment, the CVP produces electric power

and provides flood protection, navigation, recreation, and water quality benefits (USBR 2011).

DWR is a State agency that is responsible for managing and implementing the State Water Project (SWP). The SWP is a water storage and delivery system of reservoirs, aqueducts, power plants and pumping plants. Its main purpose is to store water and distribute it to 29 urban and agricultural water suppliers in Northern California, the San Francisco Bay Area, the San Joaquin Valley, the Central Coast, and Southern California (DWR 2010).

Local water districts, irrigation districts, special districts, and jurisdictions (e.g., cities and counties) manage and regulate the availability of water supplies and the treatment and delivery of water to individual projects. Depending on their location and the source of their supplies, these agencies may use groundwater, surface water through specific water entitlements, or surface water delivered through the CVP or SWP. In some remote areas not served by a water supply agency, individual developments may need to rely upon the underlying groundwater basin for their water supply. In these cases, the project would be required to secure a permit from the local or state land use authority and seek approval for development of the groundwater well(s).

b) Wastewater Collection and Treatment

The SWRCB is the state agency responsible for the regulation of wastewater discharges to surface waters and groundwater via land discharge. The SWRCB and nine RWQCBs are responsible for development and enforcement of water quality objectives and implementation plans that protect the beneficial uses of the federal and state waters. The SWRCB also administers water rights in California. The RWQCB's are responsible for issuing permits or other discharge requirements to individual wastewater dischargers and for ensuring that they are meeting the requirements of the permit through monitoring and other controls.

Wastewater collection, treatment, and discharge service for developed and metropolitan areas is typically provided by local wastewater service districts or agencies that may or may not be operated by the local jurisdiction (e.g., city or county). These agencies are required to secure treatment and discharge permits for the operation of a wastewater facility from the RWQCB. Wastewater is typically collected from a specific development and conveyed through a series of large pipelines to the treatment facility where it is treated to permitted levels and discharged to surface waters or the land.

In areas that are remote or that are not served by an individual wastewater service provider, developments would be required to install an individual septic tank or other on-site wastewater treatment system. These facilities would need to be approved by the local or state land use authority and the RWQCB.

c) Electricity and Natural Gas

The CPUC regulates investor-owned electric and natural gas companies located within California. The CPUC's Energy Division develops and administers energy policy and programs and monitors compliance with the adopted regulations. One-third of California's electricity and natural gas is provided by one of three companies: Pacific Gas and Electric Company, Southern California Edison, San Diego Gas and Electric Company (CPUC 2010).

Locally, energy service is provided by a public or private utility. New development projects would need to coordinate with the local service provider to ensure adequate capacity is available to serve the development.

d) Solid Waste Collection and Disposal

Statewide, the California Department of Resources Recycling and Recovery (CalRecycle), which is a department of the CNRA, is responsible for the regulation of the disposal and recycling of all solid waste generated in California. Cal Recycle acts as an enforcement agency in the approval and regulation of solid waste disposal and recycling facilities. Local agencies can create local enforcement agencies and, once approved by Cal Recycle, they can serve as the enforcement agency for landfills and recycling facilities with their jurisdictions.

Local agencies or private companies own and operate landfill facilities and solid waste is typically hauled to these facilities by private or public haulers. Individual projects would need to coordinate with the local service provider and landfill to determine if adequate capacity exists to serve the project.

B. Regulatory Setting

Applicable laws and regulations associated with utilities are discussed in Table 22.

Table 22: Applicable Laws and Regulations for Utilities

Regulation	Description
Federal	
Federal Power Act of 1935	In the Federal Power Act of 1935 (49 Stat. 803), created the Federal Power Commission, an independent regulatory agency with authority over both the interstate transmission of electricity and the sale of hydroelectric power at the wholesale level. The act requires the commission to ensure that electricity rates are "reasonable, nondiscriminatory and just to the consumer." The Federal Power Act of 1935 also amended the criteria that the commission must apply in deciding whether to license the construction and operation of new hydroelectric facilities.

Table 22: Applicable Laws and Regulations for Utilities	
Regulation	**Description**
Natural Gas Act of 1938	Together with the Federal Power Act of 1935, the Natural Gas Act of 1938 (NGA) (P.L. 75-688, 52 Stat. 821) was an essential piece of energy legislation in the first half of the 20th century. These statutes regulated interstate activities of the electric and natural gas industries, respectively. The acts are similarly structured and constitute the classic form of command-and-control regulation authorizing the federal government to enter into a regulatory compact with utilities. In short, the Natural Gas Act enabled federal regulators to set prices for gas sold in interstate commerce in exchange for exclusive rights to transport the gas.
Natural Gas Policy Act of 1978	The Natural Gas Policy Act of 1978 (NGPA) granted the FERC authority over intrastate as well as interstate natural gas production. The NGPA established price ceilings for wellhead first sales of gas that vary with the applicable gas category and gradually increase over time.
State	
Waste Heat and Carbon Emissions Reduction Act of 2007	The Waste Heat and Carbon Emissions Reduction Act of 2007 (AB 1613), placed requirements on the CPUC, the CEC, and local electric utilities to develop incentive programs and technical efficiency guidelines to encourage the installation of small CHP systems. The CEC approved efficiency and certification guidelines for eligible systems under AB 1613 in January 2010, and the CPUC approved standardized contracting and pricing provisions between CHP operators and the Investor Owned Utilities in November 2012.
Section 21151.9 of the PRC/ Section 10910 et seq. of the Water Code	Required the preparation of a water supply assessment (WSA) for large developments. These assessments are prepared by public water agencies responsible for providing service and address whether there are adequate existing and projected future water supplies to serve the proposed project. All projects that meet the qualifications for preparing a WSA must identify the water supplies and quantities that would serve the project as well as project the total water demand for the service area (including the project's water demands) by source in 5-year increments over a 20-year period. This information must include data for a normal, single-dry, and multiple-dry years. The WSA is required to be approved by the water service agency before the project can be implemented.

ATTACHMENT 1 REFERENCES

1. Arnold, Jeanne E., and Anthony P. Graesch. 2004. The Later Evolution of the Island Chumash. In Foundations of Chumash Complexity, edited by Jeanne E. Arnold, pp. 3-4. Costen Institute of Archaeology, University of California, Los Angeles, CA.

2. Bean, Lowell J., 1978. Social Organization. In California, edited by Robert F. Heizer, pp. 673–674. Handbook of North American Indians, Vol. 8, William G. Sturtevant, general editor, Smithsonian Institution, Washington, D.C.

3. Bean, Lowell J., and Charles R. Smith. 1978. Gabrielino. In California, edited by Robert F. Heizer, pp. 538. Handbook of North American Indians, Vol. 8, William G. Sturtevant, general editor, Smithsonian Institution, Washington, D.C.

4. Bean, Lowell J., and Sylvia Brakke Vane. 1978. Cults and their Transformations. In California, edited by Robert F. Heizer, pp. 662-669. Handbook of North American Indians, Vol. 8, William G. Sturtevant, general editor, Smithsonian Institution, Washington, D.C.

5. Beck, Warren A., and Ynez D. Haase. 1974. Historical Atlas of California, p 24. University of Oklahoma Press, Norman, Oklahoma

6. Bryant, W.A. and Hart, E.W. 2007. Fault-Rupture Hazard Zones in California, Alquist-Priolo Earthquake Fault Zoning Act with Index into Earthquake Fault Zone Maps, Special Publication 42, California Geological Survey. Available: ftp://ftp.consrv.ca.gov/pub/dmg/pubs/sp/Sp42.pdf. Accessed November 13, 2015.

7. California Air Resources Board (ARB). 2009. California Almanac of Emissions and Air Quality. Available: http://www.arb.ca.gov/aqd/almanac/almanac09/almanac2009all.pdf. Accessed: November 13, 2015.

8. ARB. 2013. Almanac Emission Projection Data. 2012 Estimated Annual Average Emissions. Statewide. Available: http://www.arb.ca.gov/app/emsinv/2013/emseic1_query.php?F_DIV=-4&F_YR=2012&F_SEASON=A&SP=2013&F_AREA=CA. Accessed: February 2016.

9. ARB. 2015. 2015 Edition. California GHG emission Inventory. Available: http://www.arb.ca.gov/cc/inventory/pubs/reports/ghg_inventory_trends_00-13%20_10sep2015.pdf. Accessed: February 2016.

10. California Department of Conservation. 2015. The California Land Conservation Act 2014 Status Report. The Williamson Act. Available:

http://www.conservation.ca.gov/dlrp/lca/stats_reports/Documents/2014%20LCA%20Status%20Report_March_2015.pdf. Accessed: February 2016.

11. California Department of Fish and Wildlife (CDFW). 2014b (August). Summary of Natural Community Conservation Plans. Available: https://www.wildlife.ca.gov/Conservation/Planning/NCCP. Accessed: November 13, 2015.

12. CDFW. 2015. State Wildlife Action Plan. 2015 Update. Volume 1: Plan Update. Available: https://www.wildlife.ca.gov/SWAP. Accessed: February 2016.

13. CDFW. 2014a. Timberland Conservation Program. Available: ftp://ftp.conservation.ca.gov/pub/oil/SB4DEIR/docs/AGF_CDFW_2014.pdf. Accessed: February 2016.

14. California Department of Transportation (Caltrans). 2002. California Airport Land Use Planning Handbook. http://www.dot.ca.gov/hq/planning/aeronaut/documents/alucp/AirportLandUsePlanningHandbook.pdf. Accessed: November 13, 2015.

15. Caltrans. 2004. Transportation- and Construction-Induced Vibration Guidance Manual, p 5. Available: http://www.dot.ca.gov/hq/env/noise/pub/vibrationmanFINAL.pdf. Accessed: November 13, 2015.

16. Caltrans. 2008. A Historical Context and Archaeological Research Design for Mining Properties in California. Division of Environmental Analysis, Department of Transportation, Sacramento, CA. Available: http://www.dot.ca.gov/ser/downloads/cultural/work_camps_final.pdf. Accessed: November 13, 2015.

17. Caltrans. 2009. Technical Noise Supplement, 2-21, 2-52, 2-65 – 2-66. Available: http://www.dot.ca.gov/hq/env/noise/pub/tens_complete.pdf. Accessed: February 2016.

18. California Department of Finance (DOF). 2013. Historical Census Populations of California, Counties, and Incorporate Cities, 1850-2010. Available: http://www.dof.ca.gov/research/demographic/state_census_data_center/historical_census_1850-2010/documents/2010-1850_STCO_IncCities-FINAL.xls. Accessed: February 2016.

19. DOF. 2014. Total Population Projections for California and Counties: July 1, 2015 to 2060 in 5-year Increments. Available: http://www.dof.ca.gov/research/demographic/reports/projections/P-1/documents/P-1_Total_CAProj_2010-2060_5-Year.xls. Accessed: February 2016.

20. DOF. 2015. California Civilian Labor Force and Employment. Available: http://www.dof.ca.gov/HTML/FS_DATA/LatestEconData/FS_Employment.htm. Accessed: November 13, 2015.

21. California Department of Water Resources (DWR). 2003. California's Groundwater: Bulletin 118 Update 2003 Report. Available: http://www.water.ca.gov/pubs/groundwater/bulletin_118/california%27s_groundwater__bulletin_118_-_update_2003_/bulletin118_entire.pdf. Accessed: November 13, 2015.

22. DWR. 2008 (October). *Managing an Uncertain Future: Climate Change Adaptation Strategies for California's Water*. Available at http://www.water.ca.gov/climatechange/docs/ClimateChangeWhitePaper.pdf. Accessed February 2016.

23. DWR. 2010. California State Water Project Overview. Available: http://www.water.ca.gov/swp/. Accessed: November 13, 2013.

24. California Energy Commission (CEC). 2012 (February). Combined Heat and Power: Policy Analysis and 2011-2030 Market Assessment. Prepared by ICF International, Inc.

25. CEC. 2014a. California's Major Electricity Generation Sources.

26. CEC. 2014b. California Energy Demand 2014-2024 Final Forecast, Volume 1: Statewide Electricity Demand, End-User Natural Gas Demand, and Energy Efficiency. Available: http://www.energy.ca.gov/2013publications/CEC-200-2013-004/CEC-200-2013-004-V1-CMF.pdf. Accessed: November 13, 2015.

27. California Natural Resources Agency (CNRA). 2009. California Climate Adaptation Strategy – A Report to the Governor of California. Available: http://resources.ca.gov/docs/climate/Statewide_Adaptation_Strategy.pdf. Accessed: November 13, 2015.

28. California Natural Resources Agency. 2012. *Our Changing Climate: Vulnerability & Adaptation to the Increasing Risks of Climate Change in California*. Available at http://www.energy.ca.gov/2012publications/CEC-500-2012-007/CEC-500-2012-007.pdf. Accessed June 8, 2015.

29. California Public Utility Commission (CPUC). 2010. California's Electricity Options and Challenges Report to Governor Gray Davis. Available: http://docs.cpuc.ca.gov/published/report/gov_report.htm. Accessed: September 2010.

30. California State Parks (CSP). 2008. California Outdoor Recreation Plan. Available: http://www.parks.ca.gov/pages/795/files/2009-2014%20corp.pdf. Accessed: November 13, 2015.

31. Castillo, Edward D. 1978. The Impact of Euro-American Exploration and Settlement. In California, edited by Robert F. Heizer, pp. 99–109. Handbook of North American Indians, Vol. 8, William G. Sturtevant, general editor, Smithsonian Institution, Washington, D.C.

32. Clinkenbeard and Smith. 2013. California Non-Fuel Minerals 2011. Available: http://www.conservation.ca.gov/cgs/minerals/min_prod/Documents/non_fuel_2011.pdf. Accessed: November 13, 2015.

33. Cook, Sherburne A. 1976. The Population of California Indians: 1769-1970, pp. 4, 38, 43. University of California Press, Berkeley, CA.

34. Cook, Sherburne A. 1978. Historical Demography. In California, edited by Robert F. Heizer, pp. 91–98. Handbook of North American Indians, Vol. 8, William G. Sturtevant, general editor, Smithsonian Institution, Washington, D.C.

35. d'Azevedo, Warren (editor). 1986. Handbook of North American Indians, Vol. 11: Great Basin, pp. ix. Smithsonian Institution, Washington, D.C.

36. Egan, M. David. 2007. Architectural Acoustics, pp. 21. J. Ross Publishing. Fort Lauderdale, FL.

37. Erlandson, Jon M., Torben C. Rick, Terry L. Jones, and Judith F. Porcasi. 2007. One if by Land, Two if by Sea: Who Were the First Californians? In California Prehistory: Colonization, Culture, and Complexity, edited by Terry L. Jones and Kathryn A. Klar, pp. 53–62. AltaMira Press, Lanham, Maryland.

38. Farmland Mapping and Monitoring Program. 2015. California Department of Conservation. Available: http://www.conservation.ca.gov/dlrp/fmmp/Pages/county_info.aspx. Accessed: November 13, 2015.

39. Federal Transit Administration (FTA). 2006. Transit Noise and Vibration Impact Assessment. Available: http://www.fta.dot.gov/documents/FTA_Noise_and_Vibration_Manual.pdf. Accessed: November 13, 2015.

40. Gilreath, Amy J. 2007. Rock Art in the Golden State: Pictographs and Petroglyphs, Portable and Panoramic. In California Prehistory: Colonization, Culture, and Complexity, edited by Terry L. Jones and Kathryn A. Klar, pp. 273–278. AltaMira Press, Lanham, Maryland.

41. Harden, D. 1997. California Geology, p. 442. Prentice Hall Inc.: New Jersey.

42. Heizer, Robert F. 1978. Trade and Trails. In California, edited by Robert F. Heizer, pp. 690–693. Handbook of North American Indians, Vol. 8, William G. Sturtevant, general editor, Smithsonian Institution, Washington, D.C.

43. Hoover, Mildred B., Hero E. Rensch, Ethel G. Rensch, and William N. Abeloe. 2002. Historic Spots in California. 5th ed. Revised by Douglas E. Kyle, pp. xiii, xiv, 105-106, 302. Stanford University Press, Palo Alto, CA.

44. Hughes, Richard E., and Randall Milliken. 2007. Prehistoric Material Conveyance. In California Prehistory: Colonization, Culture, and Complexity, edited by Terry L. Jones and Kathryn A. Klar, pp. 259–271. AltaMira Press, Lanham, Maryland.

45. Intergovernmental Panel on Climate Change (IPCC). 2014. Forster, P., V. Ramaswamy, P. Artaxo, T. Berntsen, R. Betts, D.W. Fahey, J. Haywood, J. Lean, D.C. Lowe, G. Myhre, J. Nganga, R. Prinn, G. Raga, M. Schulz and R. Van Dorland, 2007: Changes in Atmospheric Constituents and in Radiative Forcing. In: Climate Change 2007: The Physical Science Basis. Contribution of Working Group I to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change [Solomon, S., D. Qin, M. Manning, Z. Chen, M. Marquis, K.B. Averyt, M. Tignor and H.L. Miller (eds.)]. Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA. Table 2.14, pp. 212-213. Available: http://www.ipcc.ch/publications_and_data/ar4/wg1/en/ch2s2-10-2.html. Accessed: November 13, 2015.

46. IPCC. 2013. Carbon and Other Biogeochemical Cycles. Available: https://www.ipcc.ch/pdf/assessment-report/ar5/wg1/WG1AR5_Chapter06_FINAL.pdf. Accessed: November 13, 2015.

47. Jefferson, George T. 2004. Colorado Desert District Paleontologic Resources and Collections Management Policy, pp. 1, 10. State of California Department of Parks and Recreation.

48. Jones, Terry L., and Kathryn A. Klar (editors). 2007. California Prehistory: Colonization, Culture, and Complexity, pp. 299-301, 303, 305, 306-307, 313. AltaMira Press, Lanham, Maryland

49. Kroeber, Alfred L. 1922. Elements of Culture in Native California, pp. 278. University of California Publications in American Archaeology and Ethnology 13(8): 278.

50. Kroeber, Alfred L. 1925. Handbook of the Indians of California. Bulletin 78, Bureau of American Ethnology, Smithsonian Institution, pp. back cover, front

cover. Government Printing Office, Washington, D.C. Reprinted 1976 by Dover Publications, Inc., New York.

51. Moratto, Michael J. 1984. California Archaeology. Academic Press, New York, pp. 226-227.

52. Mount, J.F. 1995. California Rivers and Streams: The Conflict between Fluvial Process and Land Use, pp. 146-147. University of California Press: Berkeley, CA

53. Office of Planning and Research (OPR). 2005. Tribal Consultation Guidelines: Supplement to General Plan Guidelines, p. 6. Available: http://opr.ca.gov/docs/09_14_05_Updated_Guidelines_922.pdf. Accessed: November 13, 2015.

54. Ortiz, Alfonso. 1983. Southwest: Key to Tribal Tributaries, edited by Robert F. Heizer, pp. viii-ix. Handbook of North American Indians, Vol. 10, William G. Sturtevant, general editor, Smithsonian Institution, Washington, D.C.

55. Paleontology Portal. 2003. California, US. Available: http://www.paleoportal.org/index.php?globalnac=time_space&sectionnav=state&state_id=10. Accessed: November 2011.

56. Ritchie, D. and Gates, A.G. 2001. Encyclopedia of Earthquakes and Volcanoes, pp. 248-251. Checkmark Books, New York.

57. Rolle, W. F. 1969. California a History. Second Edition, pp. 74, 218-220, 252-253, 258-259. Thomas Y. Crowell Company, USA.

58. Rondeau, Michael F., Jim Cassidy, and Terry L. Jones. 2007. Colonization Technologies: Fluted Projectile Points and the San Clemente Island Woodworking/Microblade Complex. In California Prehistory: Colonization, Culture, and Complexity, edited by Terry L. Jones and Kathryn A. Klar, pp. 63-70. AltaMira Press, Lanham, Maryland.

59. San Diego Natural History Museum. 2010. Fossil Mysteries: Fossil Field Guide. Available: http://www.sdnhm.org/exhibitions/current-exhibitions/fossil-mysteries/fossil-field-guide-a-z/ankylosaur/. Accessed: November 13, 2015.

60. Schuyler, Robert L. 1978. Indo-Euro-American Interaction: Archeological Evidence from Non-Indian Sites, edited by Robert F. Heizer, pp. 69, 75. Handbook of North American Indians, Vol. 8, William G. Sturtevant, general editor, Smithsonian Institution, Washington, D.C.

61. Shipley, William F. 1978. Native Languages of California. In California, edited by Robert F. Heizer. Handbook of North American Indians, Vol. 8, William G. Sturtevant, general editor, pp. 80-81. Smithsonian Institution, Washington, D.C.

62. Staniford, Edward F. 1975. The Pattern of California History, pp. 98-103. Canfield Press, San Francisco, CA.

63. State Water Resources Control Board. 2015 (June 29). Water Quality Control Plan for the San Francisco Bay Region. Available: http://www.waterboards.ca.gov/sanfranciscobay/water_issues/programs/planningtmdls/basinplan/web/docs/BP_all_chapters.pdf. Accessed: November 19, 2015.

64. University of California at Berkeley. 2009-2010. Languages of California. Available: http://linguistics.berkeley.edu/~survey/languages/california-languages.php. Accessed: November 13, 2015.

65. U.S. Bureau of Reclamation. 2011. Central Valley Project – General Description. Available: http://www.usbr.gov/projects/Project.jsp?proj_Name=Central+Valley+Project. Accessed: November 13, 2015.

66. U.S. Census Bureau. 2014. State and County Quickfacts. Available: http://quickfacts.census.gov/qfd/states/06000.html. Accessed: February 2016.

67. US EIA. 2013a (August 1). Energy in Brief. Available: http://www.eia.gov/energy_in_brief/article/major_energy_sources_and_users.cfm. Accessed: February 2016.

68. US EIA. 2013b. California. State Profile and Energy Estimates. Available: http://www.eia.gov/state/?sid=CA. Accessed: February 2016.

69. U.S. Environmental Protection Agency (US EPA). 1993. Guidance Specifying Management Measures for Sources of Nonpoint Pollution in Coastal Waters, EPA 840-B-92-002. U.S. Environmental Protection Agency, Office of Water, Washington, DC, Available: http://water.epa.gov/polwaste/nps/whatis.cfm. Accessed: November 13, 2015.

70. US EPA. 2011. Six Common Air Pollutants. Available: http://www3.epa.gov/airquality/urbanair/. Accessed: November 13, 2015.

71. U.S. Geological Survey (USGS) 1995. Groundwater Atlas of the United States: California, Nevada, HA 730-B, U.S. Geological Survey: Denver Colorado. Available: http://pubs.usgs.gov/ha/ha730/ch_b/B-text1.html. Accessed: November 13, 2015.

72. USGS Geological Names Committee. 2010. Divisions of Geologic Time—Major Chronostratigraphic and Geochronologic Units. Available: http://pubs.usgs.gov/fs/2007/3015/fs2007-3015.pdf. Accessed: November 19, 2015.

ATTACHMENT 2: SUMMARY OF ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

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Attachment 2: Summary of Environmental Impacts and Mitigation Measures		
Resource Area Impact **Significance Before Mitigation**	**Potential Mitigation**	**Significance After Mitigation**
Aesthetics		
Impact 1-1: Short-Term Construction-Related and Long-Term Operational Impacts on Aesthetics **Potentially Significant**	**Mitigation Measure 1-1** • *Proponents of new or modified facilities or infrastructure constructed as a result of reasonably foreseeable compliance responses would coordinate with State or local land use agencies to seek entitlements for development including the completion of all necessary environmental review requirements (e.g., CEQA). The local or State land use agency or governing body must follow all applicable environmental regulations as part of approval of a project for development.* • *Based on the results of the environmental review, proponents would implement all feasible mitigation to reduce or substantially lessen the potentially significant scenic or aesthetic impacts of the project.* • *The project proponent would color and finish the surfaces of all project structures and buildings visible to the public to: (1) minimize visual intrusion and contrast by blending with the landscape; (2) minimize glare; and (3) comply with local design policies and ordinances. The project proponent would submit a surface treatment plan to the lead agency for review and approval.* • *To the extent feasible, the sites selected for use as construction staging and laydown areas would be areas that are already disturbed and/or are in locations of low visual sensitivity. Where feasible, construction staging and laydown areas for equipment, personal vehicles, and material storage would be sited to take advantage of natural screening opportunities provided by*	**Potentially Significant and Unavoidable**

Attachment 2: Summary of Environmental Impacts and Mitigation Measures		
Resource Area Impact **Significance Before Mitigation**	**Potential Mitigation**	**Significance After Mitigation**
	existing structures, topography, and/or vegetation. Temporary visual screens would be used where helpful, if existing landscape features did not screen views of the areas. • *All construction, operation, and maintenance areas would be kept clean and tidy, including the re-vegetation of disturbed soil and storage of construction materials and equipment would be screened from view and/or are generally not visible to the public, where feasible.* • *Siting projects and their associated elements next to important scenic landscape features or in a setting for observation from State scenic highways, national historic sites, national trails, and cultural resources would be avoided to the greatest extent feasible.* • *The project proponent would contact the lead agency to discuss the documentation required in a lighting mitigation plan, submit to the lead agency a plan describing the measures that demonstrate compliance with lighting requirements, and notify the lead agency that the lighting has been completed and is ready for inspection.*	
Agriculture Resources		
Impact 2-1: Short-Term Construction-Related and Long-Term Operational-Related Effects to Agricultural and Forest Resources **Potentially Significant**	**Mitigation Measure 2-1** • Proponents of new or modified facilities constructed as a result of reasonably foreseeable compliance responses would coordinate with local or State land use agencies to seek entitlements for development including the completion of all necessary environmental review requirements (e.g., CEQA). The local or State land use agency or governing body must follow all applicable environmental regulations as part of approval of a project	**Potentially Significant and Unavoidable**

Attachment 2: Summary of Environmental Impacts and Mitigation Measures		
Resource Area Impact **Significance Before Mitigation**	**Potential Mitigation**	**Significance After Mitigation**
	for development. • Based on the results of the environmental review, proponents would implement all feasible mitigation to reduce or substantially lessen the environmental impacts of the project. Because ARB has no land use authority, mitigation is not within its purview to reduce potentially significant impacts to less-than-significant levels. Any mitigation specifically required for a new or modified facility would be determined by the local lead agency and future environmental documents by local and State lead agencies should include analysis of the following: ■ Avoidance of lands designated as Important Farmlands (State defined Prime Farmland, Farmland of Statewide Importance, and Unique Farmland) as defined by the Farmland Mapping and Monitoring Program. ■ Analysis of the feasibility of using farmland that is not designated as Important Farmland prior to deciding on the conversion of Important Farmland. ■ The feasibility, proximity, and value of the proposed project sites should be balanced before a decision is made to locate a facility on land designated as Important Farmland. ■ Any action resulting in the conversion of Important Farmlands should consider mitigation for the loss	

Attachment 2: Summary of Environmental Impacts and Mitigation Measures		
Resource Area Impact **Significance Before Mitigation**	**Potential Mitigation**	**Significance After Mitigation**
	of such farmland. Any such mitigation should be completed prior to the issuance of a grading or building permit by providing the permitting agency with written evidence of completion of the mitigation. Mitigation may include but is not limited to: - Permanent preservation of off-site Important Farmland (State defined Prime Farmland, Farmland of Statewide Importance, and Unique Farmland) of equal or better agricultural quality, at a ratio of at least 1:1. - Preservation may include the purchase of agricultural conservation easement(s); purchase of credits from an established agricultural farmland mitigation bank; contribution of agricultural land or equivalent funding to an organization that provides for the preservation of farmland towards the ultimate purchase of an agricultural conservation easement. - Participation in any agricultural land mitigation program, including local government maintained, that provides equal or more effective mitigation than the measures listed.	

Attachment 2: Summary of Environmental Impacts and Mitigation Measures		
Resource Area Impact **Significance Before Mitigation**	**Potential Mitigation**	**Significance After Mitigation**
Air Quality		
Impact 3-1: Short-Term Construction-Related Effects to Air Quality **Potentially Significant**	**Mitigation Measure 3-1** • *Proponents of new or modified facilities or infrastructure constructed as a result of reasonably foreseeable compliance responses would coordinate with State or local land use agencies to seek entitlements for development including the completion of all necessary environmental review requirements (e.g., CEQA). The local or State land use agency or governing body must follow all applicable environmental regulations as part of approval of a project for development.* • *Based on the results of the environmental review, proponents would implement all feasible mitigation to reduce or substantially lessen the potentially significant scenic or aesthetic impacts of the project.* o *Project proponents would apply for, secure, and comply with all appropriate air quality permits for project construction from the local agencies with air quality jurisdiction and from other applicable agencies, if appropriate, prior to construction mobilization.* o *Project proponents would comply with the federal Clean Air Act (The Act) and the California Clean Air Act (e.g., New Source Review and Best Available Control Technology criteria, if applicable).* o *Project proponents would comply with local plans, policies, ordinances, rules, and regulations regarding air quality-related emissions and associated exposure (e.g., construction-related fugitive PM dust regulations, indirect source review, and payment into offsite mitigation funds).*	**Potentially Significant and Unavoidable**

Attachment 2: Summary of Environmental Impacts and Mitigation Measures		
Resource Area Impact **Significance Before Mitigation**	**Potential Mitigation**	**Significance After Mitigation**
	o *For projects located in PM nonattainment areas, prepare and comply with a dust abatement plan that addresses emissions of fugitive dust during construction and operation of the project.*	
Impact 3-2: Long-Term Operational-Related Effects to Air Quality **Beneficial**	No Mitigation Required	**Not Applicable**
Biological Resources		
Impact 4-1: Short-Term Construction-Related Effects to Biological Resources **Potentially Significant**	**Mitigation Measure 4-1** • Proponents of new or modified facilities or infrastructure constructed as a result of reasonably foreseeable compliance responses would coordinate with State or local land use agencies to seek entitlements for development including the completion of all necessary environmental review requirements (e.g., CEQA). The local or State land use agency or governing body must follow all applicable environmental regulations as part of approval of a project for development. • Based on the results of the environmental review, proponents would implement all feasible mitigation to reduce or substantially lessen the potentially significant scenic or aesthetic impacts of the project. o Actions required to mitigate potentially significant biological impacts may include the following; however, any mitigation	**Potentially Significant and Unavoidable**

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Resource Area Impact **Significance Before Mitigation**	**Potential Mitigation**	**Significance After Mitigation**
	specifically required for a new or modified facility would be determined by the local lead agency. o Retain a qualified biologist to prepare a biological inventory of site resources prior to ground disturbance or construction. If protected species or their habitats are present, comply with applicable federal and State endangered species acts and regulations. Construction and operational planning will require that important fish or wildlife movement corridors or nursery sites are not impeded by project activities. o Retain a qualified biologist to prepare a wetland survey of onsite resources. This survey shall be used to establish setbacks and prohibit disturbance of riparian habitats, streams, intermittent and ephemeral drainages, and other wetlands. Wetland delineation is required by Section 404 of the Clean Water Act and is administered by the U.S. Army Corps of Engineers. o Prohibit construction activities during the rainy season with requirements for seasonal weatherization and implementation of erosion prevention practices. o Prohibit construction activities in the vicinity of raptor nests during nesting season or establish protective buffers and provide monitoring, as needed, to address project activities that could cause an active nest to fail. o Prepare site design and development plans that avoid or	

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Resource Area Impact **Significance Before Mitigation**	**Potential Mitigation**	**Significance After Mitigation**
	minimize disturbance of habitat and wildlife resources, and prevent stormwater discharge that could contribute to sedimentation and degradation of local waterways. Depending on disturbance size and location, a National Pollution Discharge Elimination System (NPDES) construction permit may be required from the California State Water Resources Control Board. o Prepare spill prevention and emergency response plans, and hazardous waste disposal plans as appropriate to protect against the inadvertent release of potentially toxic materials. o Plant replacement trees and establish permanent protection suitable habitat at ratios considered acceptable to comply with “no net loss” requirements. o Contractor will keep the site and materials organized and store them in a way to prevent attracting wildlife by not creating places for wildlife to hide or nest (e.g., capping pipes, covering trashcans and emptying trash receptacles consistently and promptly when full).	

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Resource Area Impact **Significance Before Mitigation**	**Potential Mitigation**	**Significance After Mitigation**
Impact 4-2 Long-Term Operational-Related Effects to Biological Resources **Potentially Significant**	**Mitigation Measure 4-2:** Implement Mitigation Measure 4-2	**Potentially Significant and Unavoidable**
Cultural Resources		
Impact 5-1: Short-Term Construction-Related and Long-Term Operational Effects to Cultural Resources **Potentially Significant**	**Mitigation Measure 5-1** • Proponents of new or modified facilities or infrastructure constructed as a result of reasonably foreseeable compliance responses would coordinate with State or local land use agencies to seek entitlements for development including the completion of all necessary environmental review requirements (e.g., CEQA). The local or State land use agency or governing body must follow all applicable environmental regulations as part of approval of a project for development. • Based on the results of the environmental review, proponents would implement all feasible mitigation to reduce or substantially lessen the potentially significant scenic or aesthetic impacts of the project. Actions required to mitigate potentially significant cultural impacts may include the following; however, any mitigation specifically required for a new or modified facility would be determined by the local lead agency. ■ Retain the services of cultural resources specialists with training and background that conforms to the U.S. Secretary of Interior's Professional Qualifications Standards, as	**Potentially Significant and Unavoidable**

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Resource Area Impact **Significance Before Mitigation**	**Potential Mitigation**	**Significance After Mitigation**
	published in Title 36, Code of Federal Regulations, part 61. ■ Seek guidance from the State and federal lead agencies, as appropriate, for coordination of Nation-to-Nation consultations with the Native American Tribes. ■ Provide notice to Native American Tribes of project details to identify potential Tribal Cultural Resources (TCRs). In the case that a TRC is identified, prepare mitigation measures that: - Avoid and preserve the resources in place, - Treat the resource with culturally appropriate dignity, - Employ permanent conservation easements, and - Protect the resource. ■ Consult with lead agencies early in the planning process to identify the potential presence of cultural properties. The agencies will provide the project developers with specific instruction on policies for compliance with the various laws and regulations governing cultural resources management, including coordination with regulatory agencies and Native American Tribes. ■ Define the area of potential effect (APE) for each project, which is the area within which project construction and operation may directly or indirectly cause alterations in the character or use of historic properties. The APE should include a reasonable construction buffer zone and laydown areas, access roads, and borrow areas, as well	

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Resource Area Impact **Significance Before Mitigation**	**Potential Mitigation**	**Significance After Mitigation**
	as a reasonable assessment of areas subject to effects from visual, auditory, or atmospheric impacts, or impacts from increased access. ■ Retain the services of a paleontological resources specialist with training and background that conforms with the minimum qualifications for a vertebrate paleontologist as described in Measures for Assessment and Mitigation of Adverse Impacts to Non-Renewable Paleontologic Resources: Standard Procedures (Society of Vertebrate Paleontology 2010). ■ Conduct initial scoping assessments to determine whether proposed construction activities would disturb formations that may contain important paleontological resources. Whenever possible potential impacts to paleontological resources should be avoided by moving the site of construction or removing or reducing the need for surface disturbance. The scoping assessment should be conducted by the qualified paleontological resources specialist in accordance with applicable agency requirements. ■ The project proponent's qualified paleontological resources specialist would determine whether paleontological resources would likely be disturbed in a project area on the basis of the sedimentary context of the area and a records search for past paleontological finds in the area. The assessment may suggest areas of high known potential for containing resources. If the	

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Resource Area Impact **Significance Before Mitigation**	**Potential Mitigation**	**Significance After Mitigation**
	assessment is inconclusive a surface survey is recommended to determine the fossiliferous potential and extent of the pertinent sedimentary units within the project site. If the site contains areas of high potential for significant paleontological resources and avoidance is not possible, prepare a paleontological resources management and mitigation plan that addresses the following steps: - a preliminary survey (if not conducted earlier) and surface salvage prior to construction; - physical and administrative protective measures and protocols such as halting work, to be implemented in the event of fossil discoveries; - monitoring and salvage during excavation; - specimen preparation; - identification, cataloging, curation and storage; and - a final report of the findings and their significance.	
Energy Demand		
Impact 6-1: Short Term Construction-Related Impacts on Energy Demand	No Mitigation Required	**Not Applicable**

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Resource Area Impact **Significance Before Mitigation**	**Potential Mitigation**	**Significance After Mitigation**
Less-Than-Significant		
Impact 6-2: Long-Term Operational Impacts on Energy Demand **Beneficial**	No Mitigation Required	**Not Applicable**
Geology, Soils and Minerals		
Impact 7-1: Short-Term Construction-Related and Long-Term Operational Effects on Geology, Seismicity, and Soils **Potentially Significant**	**Mitigation Measure 7-1** • Proponents of new or modified facilities or infrastructure constructed as a result of reasonably foreseeable compliance responses would coordinate with State or local land use agencies to seek entitlements for development including the completion of all necessary environmental review requirements (e.g., CEQA). The local or State land use agency or governing body must follow all applicable environmental regulations as part of approval of a project for development. • Based on the results of the environmental review, proponents would implement all feasible mitigation to reduce or substantially lessen the potentially significant scenic or aesthetic impacts of the project. Actions required to mitigate potentially significant geology and soil impacts may include the following; however, any mitigation specifically required for a new or modified facility would be determined by the local lead agency. ▪ Prior to the issuance of any development permits, proponents of new or modified facilities or infrastructure	**Potentially Significant and Unavoidable**

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Resource Area Impact **Significance Before Mitigation**	**Potential Mitigation**	**Significance After Mitigation**
	would prepare a geotechnical investigation/study, which would include an evaluation of the depth to the water table, liquefaction potential, physical properties of subsurface soils including shrink-swell potential (expansion), soil resistivity, slope stability, mineral resources, and the presence of hazardous materials. ■ Proponents of new or modified facilities or infrastructure would provide a complete site grading plan, and drainage, erosion, and sediment control plan with applications to applicable lead agencies. Proponents would avoid locating facilities on steep slopes, in alluvial fans and other areas prone to landslides or flash floods, or with gullies or washes, as much as possible. ■ Disturbed areas outside of the permanent construction footprint would be stabilized or restored using techniques such as soil loosening, topsoil replacement, revegetation, and surface protection (i.e., mulching).	
Greenhouse Gas Emissions		
Impact 8-1: Short-Term Construction-Related and Long-Term Operational Greenhouse Gas Impacts **Beneficial**	No Mitigation Required	**Not Applicable**
Hazards and Hazardous Materials		
Impact 9-1: Short-Term	**Mitigation Measure 9-1** • *Proponents of new or modified facilities or infrastructure*	**Potentially Significant**

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Resource Area Impact **Significance Before Mitigation**	**Potential Mitigation**	**Significance After Mitigation**
Construction-Related Hazard Impacts **Potentially Significant**	*constructed as a result of reasonably foreseeable compliance responses would coordinate with State or local land use agencies to seek entitlements for development including the completion of all necessary environmental review requirements (e.g., CEQA). The local or State land use agency or governing body must follow all applicable environmental regulations as part of approval of a project for development.* • *Based on the results of the environmental review, proponents would implement all feasible mitigation to reduce or substantially lessen the potentially significant scenic or aesthetic impacts of the project. Actions required to mitigate potentially significant upset and accident-related hazard impacts may include the following; however, any mitigation specifically required for a new or modified facility would be determined by the local lead agency.* • *Handling of potentially hazardous materials/wastes should be performed under the direction of a licensed professional with the necessary experience and knowledge to oversee the proper identification, characterization, handling and disposal or recycling of the materials generated as a result of the project. As wastes are generated, they would be placed, at the direction of the licensed professional, in designated areas that offer secure, secondary containment and/or protection from stormwater runoff. Other forms of containment may include placing waste on plastic sheeting (and/or covering with same) or in steel bins or other suitable containers pending profiling and disposal or recycling.* • *The temporary storage and handling of potentially hazardous materials/wastes should be in areas away from sensitive receptors such as schools or residential areas. These areas should be*	**and Unavoidable**

Attachment 2: Summary of Environmental Impacts and Mitigation Measures		
Resource Area Impact **Significance Before Mitigation**	**Potential Mitigation**	**Significance After Mitigation**
	secured with chain-link fencing or similar barrier with controlled access to restrict casual contact from non-project personnel. All project personnel that may come into contact with potentially hazardous materials/wastes will have the appropriate health and safety training commensurate with the anticipated level of exposure.	
Impact 9-2: Long-Term Increased Transport, Use, and Disposal of Hazardous Materials **Less-Than-Significant**	No Mitigation Required	**Not Applicable**
Hydrology and Water Quality		
Impact 10-1: Short-Term Construction-Related Hydrologic Resource Impacts **Potentially Significant**	**Mitigation Measure 10-1** • Proponents of new or modified facilities or infrastructure constructed as a result of reasonably foreseeable compliance responses would coordinate with State or local land use agencies to seek entitlements for development including the completion of all necessary environmental review requirements (e.g., CEQA). The local or State land use agency or governing body must follow all applicable environmental regulations as part of approval of a project for development. • Based on the results of the environmental review, proponents would implement all feasible mitigation to reduce or substantially lessen the potentially significant scenic or aesthetic impacts of the project. Actions required to mitigate potentially significant hydrology and water quality impacts may	**Potentially Significant and Unavoidable**

Attachment 2: Summary of Environmental Impacts and Mitigation Measures		
Resource Area Impact **Significance Before Mitigation**	**Potential Mitigation**	**Significance After Mitigation**
	include the following; however, any mitigation specifically required for a new or modified facility would be determined by the local lead agency. ■ Under the oversight of the local lead agency, prior to issuance of any construction permits, the proponents for the proposed renewable energy project would prepare a stormwater drainage and flood control analysis and management plan. The plans would be prepared by a qualified professional and would summarize existing conditions and the effects of project improvements, and would include all appropriate calculations, a watershed map, changes in downstream flows and flood elevations, proposed on- and off-site improvements, features to protect downstream uses, and property and drainage easements to accommodate downstream flows from the site. Project drainage features would be designed to protect existing downstream flow conditions that would result in new or increased severity of offsite flooding. ■ Establish drainage performance criteria for off-site drainage, in consultation with county engineering staff, such that project-related drainage is consistent with applicable facility designs, discharge rates, erosion protection, and routing to drainage channels, which could be accomplished by, but is not limited to: (a) minimizing directly connected impervious areas; (b) maximizing permeability of the site; and, (c) stormwater quality controls such as infiltration, detention/retention, and/or biofilters; and basins, swales,	

Attachment 2: Summary of Environmental Impacts and Mitigation Measures		
Resource Area Impact **Significance Before Mitigation**	**Potential Mitigation**	**Significance After Mitigation**
	and pipes in the system design. ■ The project proponent would design and construct new facilities to provide appropriate flood protection such that operations are not adversely affected by flooding and inundation. These designs would be approved by the local or State land use agency. The project proponent would also consult with the appropriate flood control authority on the design of offsite stream crossings such that the minimum elevations are above the predicted surface-water elevation at the agency's designated design peak flows. Drainage and flood prevention features shall be inspected and maintained on a routine schedule specified in the facility plans, and as specified by the county authority. ■ As part of subsequent project-level planning and environmental review, the project proponent shall coordinate with the local groundwater management authority and prepare a detailed hydrogeological analysis of the potential project-related effects on groundwater resources prior to issuance of any permits. The proponent shall mitigate for identified adverse changes to groundwater by incorporating technically achievable and feasible modifications into the project to avoid offsite groundwater level reductions, use alternative technologies or changes to water supply operations, or otherwise compensate or offset the groundwater reductions.	
Impact 10-2: Long-Term	**Mitigation Measure 10-2**	**Potentially**

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Resource Area Impact **Significance Before Mitigation**	**Potential Mitigation**	**Significance After Mitigation**
Effects on Hydrology and Water Quality Related to Changes in Land Use **Potentially Significant**	• *Use no-till agriculture to reduce soil erosion.* • *Avoid harvesting in areas with steep slopes.* • *Identify and avoid areas with unstable slopes and local factors that can cause slope instability (groundwater conditions, precipitation, seismic activity, slope angles, and geologic structure).* • *Identify soil properties, engineering constraints, and facility design criteria.* • *Develop a site grading and management plan to identify areas of disturbance, areas of cut and fill, slope during and after grading, existing vegetation, and measures to protect slope, drainages, and existing vegetation in the project area.* • *Develop an erosion control plan to delineate measures to minimize soil loss and reduce sedimentation to protect water quality.* • *Design runoff control features to minimize soil erosion.* • *Construct drainage ditches only where necessary.* • *Use appropriate structures at culvert outlets to prevent erosion.*	**Significant and Unavoidable**
Land Use and Planning		
Short-Term Construction-Related and Long-Term Operational Impacts on Land Use and Planning **Less-Than-Significant**	No Mitigation Required Potential indirect environmental effects are discussed under Impacts 2-1, 2-2, 4-1, 4-2, 8-2, and 10-1.	**Not Applicable**

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Resource Area Impact **Significance Before Mitigation**	**Potential Mitigation**	**Significance After Mitigation**
Mineral Resources		
Impact 12-1: Short-Term Construction-Related Impacts on Mineral Resource **Less-Than-Significant**	No Mitigation Required	**Not Applicable**
Impact 12-2: Long-Term Operational Impacts on Mineral Resources **Less-Than-Significant**	No Mitigation Required	**Not Applicable**
Noise		
Impact 13-1 Short-Term Construction-Related Noise Impacts **Potentially Significant**	**Mitigation Measure 13-1** • *Proponents of new or modified facilities or infrastructure constructed as a result of reasonably foreseeable compliance responses would coordinate with State or local land use agencies to seek entitlements for development including the completion of all necessary environmental review requirements (e.g., CEQA). The local or State land use agency or governing body must follow all applicable environmental regulations as part of approval of a project for development.* • *Based on the results of the environmental review, proponents would implement all feasible mitigation to reduce or substantially lessen the potentially significant scenic or aesthetic impacts of the project. Actions required to mitigate potentially significant noise impacts may include the following; however, any mitigation specifically required for a new or*	**Potentially Significant and Unavoidable**

Attachment 2: Summary of Environmental Impacts and Mitigation Measures		
Resource Area Impact **Significance Before Mitigation**	**Potential Mitigation**	**Significance After Mitigation**
	modified facility would be determined by the local lead agency. • *Ensure noise-generating construction activities (including truck deliveries, pile driving, and blasting) are limited to the least noise-sensitive times of day (e.g., weekdays during the daytime hours) for projects near sensitive receptors.* • *Consider use of noise barriers, such as berms, to limit ambient noise at property lines, especially where sensitive receptors may be present.* • *Ensure all project equipment has sound-control devices no less effective than those provided on the original equipment.* • *All construction equipment used would be adequately muffled and maintained.* • *Consider use of battery-powered forklifts and other facility vehicles.* • *Ensure all stationary construction equipment (i.e., compressors and generators) is located as far as practicable from nearby sensitive receptors or shielded.* • *Properly maintain mufflers, brakes and all loose items on construction and operation related vehicles to minimize noise and address operational safety issues. Keep truck operations to the quietest operating speeds. Advise about downshifting and vehicle operations in sensitive communities to keep truck noise to a minimum.* • *Use noise controls on standard construction equipment; shield impact tools.* • *Consider use of flashing lights instead of audible back-up alarms*	

Attachment 2: Summary of Environmental Impacts and Mitigation Measures		
Resource Area Impact **Significance Before Mitigation**	**Potential Mitigation**	**Significance After Mitigation**
	on mobile equipment. • *Install mufflers on air coolers and exhaust stacks of all diesel and gas-driven engines.* • *Equip all emergency pressure relief valves and steam blow-down lines with silencers to limit noise levels.* • *Contain facilities within buildings or other types of effective noise enclosures.* • *Employ engineering controls, including sound-insulated equipment and control rooms, to reduce the average noise level in normal work areas.*	
Impact 13-2: Long-Term Operational Noise Impacts **Potentially Significant**	***Mitigation Measure 13-2:*** *Implement Mitigation Measure 13-1*	**Potentially Significant and Unavoidable**
Population and Housing		
Impact 14-1: Short-Term Construction-Related and Long-Term Operational-Related Effects to Population and Housing **Less-Than-Significant**	No Mitigation Required	**Not Applicable**
Public Services		
Impact 15-1: Short-Term Construction-Related and Long-Term Operational-Related Effects to Public	No Mitigation Required	**Not Applicable**

Attachment 2: Summary of Environmental Impacts and Mitigation Measures		
Resource Area Impact **Significance Before Mitigation**	**Potential Mitigation**	**Significance After Mitigation**
Services **Less-Than-Significant**		
Recreation		
Impact 16-1: Short-Term Construction-Related and Long-Term Operational-Related Effects to Recreation **Less-Than-Significant**	No Mitigation Required	**Not Applicable**
Transportation and Traffic		
Impact 17-1: Short-Term Construction-Related Impacts on Traffic and Transportation **Potentially Significant**	**Mitigation Measure 17-1** • Proponents of new or modified facilities or infrastructure constructed as a result of reasonably foreseeable compliance responses would coordinate with State or local land use agencies to seek entitlements for development including the completion of all necessary environmental review requirements (e.g., CEQA). The local or State land use agency or governing body must follow all applicable environmental regulations as part of approval of a project for development. • Based on the results of the environmental review, proponents would implement all feasible mitigation to reduce or substantially lessen the potentially significant scenic or aesthetic impacts of the project. Actions required to mitigate potentially significant traffic impacts may include the following; however, any mitigation specifically required for a new or modified facility would be determined by the local lead agency. ■ Minimize the number and length of access, internal,	**Potentially Significant and Unavoidable**

Attachment 2: Summary of Environmental Impacts and Mitigation Measures		
Resource Area Impact **Significance Before Mitigation**	**Potential Mitigation**	**Significance After Mitigation**
	service, and maintenance roads and use existing roads when feasible. ■ Provide for safe ingress and egress to/from the proposed project site. Identify road design requirements for any proposed roads, and related road improvements. ■ If new roads are necessary, prepare a road siting plan and consult standards contained in federal, State, or local requirements. The plans should include design and construction protocols to meet the appropriate roadway standards and be no larger than necessary to accommodate their intended functions (e.g., traffic volume and weight of vehicles). Access roads should be located to avoid or minimize impacts to washes and stream crossings, follow natural contours and minimize side-hill cuts. Roads internal to a project site should be designed to minimize ground disturbance. Excessive grades on roads, road embankments, ditches, and drainages should be avoided, especially in areas with erodible soils. ■ Prepare a Construction Traffic Control Plan and a Traffic Management Plan.	

Attachment 2: Summary of Environmental Impacts and Mitigation Measures		
Resource Area Impact **Significance Before Mitigation**	**Potential Mitigation**	**Significance After Mitigation**
Impact 17-2: Long-Term Operational Impacts on Traffic and Transportation **Potentially Significant**	**Mitigation Measure 17-1:** Implement Mitigation Measure 17-2	**Potentially Significant and Unavoidable**
Utilities and Service Systems		
Impact 18-1: Short-Term Construction Related and Long-Term Operational Impacts on Utilities and Service Systems **Potentially Significant**	**Mitigation Measure 18-1** • Proponents of new or modified facilities or infrastructure constructed as a result of reasonably foreseeable compliance responses would coordinate with State or local land use agencies to seek entitlements for development including the completion of all necessary environmental review requirements (e.g., CEQA). The local or State land use agency or governing body must follow all applicable environmental regulations as part of approval of a project for development. • Based on the results of the environmental review, proponents would implement all feasible mitigation to reduce or substantially lessen the potentially significant scenic or aesthetic impacts of the project. Actions required to mitigate potentially significant utility or service-related impacts may include the following; however, any mitigation specifically required for a new or modified facility would be determined by the local lead agency. ■ Comply with local plans and policies regarding the provision of water supply, wastewater treatment, and storm water drainage utilities, and solid waste services. ■ Where an on-site wastewater system is proposed, submit a	**Potentially Significant and Unavoidable**

Attachment 2: Summary of Environmental Impacts and Mitigation Measures		
Resource Area Impact **Significance Before Mitigation**	**Potential Mitigation**	**Significance After Mitigation**
	permit application to the appropriate local jurisdiction. ■ Where appropriate, prepare a Water Supply Assessment (WSA) consistent with the requirements of Section 21151.9 of the PRC/ Section 10910 et seq. of the Water Code. The WSA would be approved by the local water agency/purveyor prior to construction of the project. ■ Comply with local plans and policies regarding the provision of wastewater treatment services.	