APPENDIX D:
~~DRAFT~~FINAL ENVIRONMENTAL IMPACT ANALYSIS

for the Proposed

Low Carbon Fuel Standard Regulation

California Air Resources Board

1001 I Street

Sacramento, California 95814

Date of Release: November 6, 2024

This page intentionally left blank.

Table of Contents

ATTACHMENTS

TABLES

FIGURES

This page intentionally left blank.

LIST OF ABBREVIATIONS

AAM	Auto Acceleration Mechanism
AB	Assembly Bill
ADF	Alternative Diesel Fuel
AJF	alternative jet fuel
APE	area of potential effect
BAAQMD	Bay Area Air Quality Management District
BEV	battery-electric vehicle
BLM	U.S. Bureau of Land Management
BMP	best management practice
CAAQS	California ambient air quality standards
CalEEMod	California Emissions Estimator Model
CAL FIRE	California Department of Forestry and Fire Protection
CARB or Board	California Air Resources Board
CBE	Communities for a Better Environment
CCR	California Code of Regulations
CCS	carbon capture and storage
CEQA	California Environmental Quality Act
CFR	Code of Federal Regulations
CI	carbon intensity
CNG	compressed natural gas
CO	carbon monoxide
CO_2	carbon dioxide
CWA	Clean Water Act

DAC	direct air capture
dBA	A-weighted decibels
CalGEM	California Department of Conservation Geologic Energy Management Division
EA	Environmental Assessment
EER	Energy Economy Ratio
EIA	environmental impact analysis
EIR	environmental impact report
EJAC	Environmental Justice Advisory Committee
EMFAC	California Emissions FACtor Model
EV	electric vehicle
FCI	Fast Charging Infrastructure
FIP	Federal Implementation Plan
FTA	Federal Transit Administration
gCO_2e/MJ	grams of carbon dioxide equivalent per megajoule of fuel energy
GHG	greenhouse gas
GTAP	Global Trade Analysis Project
HRI	Hydrogen Refueling Infrastructure
LUC	Land use change
ISOR	Initial Statement of Reasons
LCA	Life Cycle Analysis
LCFS	Low Carbon Fuel Standard
L-CNG	Liquefied Compressed Natural Gas
LD	light-duty

L_{eq}	equivalent sound level
L_{max}	maximum noise levels
LNG	liquefied natural gas
LRT	LCFS Reporting Tool
MHD	medium- and heavy-duty
$MTCO_2e$	metric tons of carbon dioxide equivalent
NAAQS	national ambient air quality standards
NO_X	oxides of nitrogen
PHEV	plug-in hybrid electric vehicle
PM	particulate matter
PM10	respirable particulate matter
PM2.5	fine particulate matter
ppb	parts per billion
PPV	peak particle velocity
PRC	Public Resources Code
Proposed Amendments	proposed regulatory amendments to the Low Carbon Fuel Standard
RCRA	Resource Conservation and Recovery Act
RNG	renewable natural gas
SAF	Sustainable Aviation Fuel
SB	Senate Bill
SIP	State Implementation Plan
SMR	steam methane reformation
TAC	toxic air contaminant
TCR	tribal cultural resource

UCO	used cooking oil
U.S. DOT	U.S. Department of Transportation
U.S. EPA	U.S. Environmental Protection Agency
U.S. GS	U.S. Geological Survey
UST	underground storage tank
VdB	vibration decibels
WSA	Water Supply Assessment
ZEV	zero-emission vehicle

PREFACE

The California Air Resources Board (CARB or Board) released a Draft Environmental Impact Analysis (Draft EIA) for the Low Carbon Fuel Standard (LCFS) Regulation, herein referred to as the Proposed Amendments, on January 5, 2024, for a 45-day public review and comment period that closed on February 20, 2024. A total of 408 comment letters were received. Out of the 408 total comments received, 117 of the comment letters were determined to raise significant environmental issues related to the analysis in the Draft EIA and are responded to in the Response to Comments on the Draft and Recirculated Environmental Impact Analysis (RTC).

After the end of the Draft EIA public review period, CARB identified revisions to certain aspects of the Proposed Amendments that merited recirculation of the Draft EIA. Those revisions included updates to the project description and the analyses of the air quality and greenhouse gas (GHG) sections of the Draft EIA. The project description was updated by incorporating 15-day changes released on August 12, 2024, to: remove fossil jet fuel from the list of transportation fuels subject to the LCFS; modify the annual carbon intensity benchmarks for gasoline and fuels used as a substitute for gasoline, diesel fuel, fuels used as a substitute for diesel fuel, and fuels used as a substitute for fossil jet fuel; expand zero emission vehicle refueling infrastructure crediting opportunities; remove eligibility for hydrogen produced from fossil fuels beginning in 2031; modify crediting provisions for biomass-based diesel pathways; reduce certain crediting periods for avoided methane emissions; provide an opportunity for automakers to generate base credits; and add further details to the sustainability certification proposal.[1] Additionally, background information and analysis was provided in the project description to consider whether dairy herd size expansion may be a reasonably foreseeable compliance response to the Proposed Amendments. Lastly, in response to public comment, the analyses of the air quality and GHG sections were reassessed and expanded with additional information for clarity. These sections were updated with modeling outputs that reflect the Proposed Scenario in the 15-day Notice package released August 12, 2024. Also, additional specificity was provided regarding the changes to the sources of particulate matter (PM) and oxides of nitrogen (NOx) emissions under the Proposed Amendments. This information matches the level of detail posted after the 45-day comment period on the Supplemental 2023 LCFS ISOR Documentation webpage.[2] The workbooks underlying these emission change graphics are also posted on the Supplemental Documentation webpage incorporated with the 15-day Notice package.[3] These evaluations are provided in Chapter 4.0 below.

---

[1] See California Air Resources Board, *Attachment A-1: Proposed 15-day Changes, Proposed Amendments to the Low Carbon Fuel Standard.* August 12, 2024. *https://ww2.arb.ca.gov/sites/default/files/barcu/regact/2024/lcfs2024/15day_atta-1.pdf*

[2] California Air Resources Board. *Supplemental 2023 LCFS ISOR Documentation.* April 9, 2024. https://ww2.arb.ca.gov/resources/documents/supplemental-2023-lcfs-isor-documentation

[3] California Air Resources Board. *Supplemental 2023 LCFS ISOR Documentation.* April 9, 2024. https://ww2.arb.ca.gov/resources/documents/supplemental-2023-lcfs-isor-documentation.

These revisions and additional information did not identify any new, significant environmental impacts, any substantial increases in the severity of a significant environmental impact, or any alternative or mitigation measure considerably different from those considered in the Draft EIA. Nonetheless, the revisions and additional information resulted in the addition of substantial new information compared to what was presented in the Draft EIA. Therefore, CARB determined that recirculation of the project description and the air quality and GHG sections was warranted. The Recirculated EIA was released on August 16, 2024, for a 45-day public review and comment period that closed on September 30, 2024. A total of 23 comment letters were received on the Recirculated EIA. All 23 comment letters are responded to in the RTC.

CARB staff combined the Draft EIA with the revised sections from the recirculated Draft EIA and made modifications to the Draft EIA to create the Final EA. Specifically, CARB replaced the project description, air quality and GHG sections in the Draft EIA with the sections from the recirculated Draft EIA. These changes are not shown in strike-though and underline format.

A second set of 15-day changes released on October 1, 2024, included additional modifications to the proposal to: delay the phase-out of hydrogen produced using fossil gas as a feedstock to 2035, revise the earlier changes to crediting for biomass-based diesel pathways, clarify automakers' ability to generate base credits, modify the timeline for triggering the proposed Automatic Acceleration Mechanism, update provisions such as capacity factors and eligibility criteria for hydrogen refueling infrastructure, clarify that non-crop feedstocks may also be assigned a land use change value, designate corn stover as a specified source feedstock, allow book-and-claim accounting of biomethane to produce electricity for electric vehicle charging, specify the reduction of crediting periods for avoided methane emissions, and ease verification requirements in specific cases, among other changes.[4] The modifications consist of revisions to provide programmatic consistency or more flexibility for regulated entities to comply with the existing proposed requirements, as well as definition, numbering, and provision clarifications that do not alter the compliance responses or associated impact conclusions. None of the modifications alter the types of foreseeable compliance responses evaluated or the significance determinations reached in the EIA, introduce new significant effects on the environment, or provide new information of substantial importance relative to the EIA. As a result, these revisions did not require recirculation of the EIA pursuant to the CEQA Guidelines, California Code of Regulations, Title 14, Section 15088.5, before consideration by the Board. To facilitate identifying modifications to the document resulting from the second set of 15-day changes and in response to comments received on the Draft EIA and Recirculated EIA, modified text is presented in the Final EIA with strike-through for deletions and underline for additions.

[4] See California Air Resources Board, *Attachment A-1: Proposed Second 15-day Changes*. October 1, 2024. *https://ww2.arb.ca.gov/sites/default/files/barcu/regact/2024/lcfs2024/2nd_15day_atta-1.pdf*

1.0 Introduction and Background

A. Introduction

This ~~draft~~ final environmental impact analysis (~~Draft~~ Final EIA) is a program environmental document prepared for the proposed regulatory amendments to the Low Carbon Fuel Standard (LCFS) (Proposed Amendments). This ~~Draft~~ Final EIA is included as Appendix D of the Proposed Amendments that will be presented to the Board for consideration. Chapter 2, "Project Description," of this ~~Draft~~ Final EIA presents a summary of the Proposed Amendments, as defined under the California Environmental Quality Act (CEQA). A detailed description of the Proposed Amendments is included in the "Staff Report: Initial Statement of Reasons for the Low Carbon Fuel Standard Regulation" released on December 19, 2023, which is hereby incorporated by reference and available at https://ww2.arb.ca.gov/rulemaking/2024/lcfs2024.

This ~~Draft~~ Final EIA is intended to identify and disclose the Proposed Amendments' potential significant impacts on the environment and identify potential feasible mitigation measures and alternatives to lessen or avoid those significant environmental impacts. The Proposed Amendments are designed to improve California's long-term ability to support the consumption of increasingly lower-carbon-intensity (CI) fuels and to improve the program's overall effectiveness. The Proposed Amendments are intended to create environmental benefits, including criteria air pollutant reductions and air quality improvements. However, in some cases, as described in Chapter 4.0 of this ~~Draft~~ Final EIA, potentially significant effects to environmental resources may occur due to implementation of compliance responses (i.e., actions taken in response to measures contained in the Proposed Amendments that would have a physical impact on the environment) associated with the Proposed Amendments. 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, due to project-specific environmental review processes associated with compliance responses and compliance with local and state laws and regulations. However, this ~~Draft~~ Final EIA takes the conservative approach in its post-mitigation significance conclusions (i.e., tending to overstate the risk that feasible mitigation may not be sufficient to mitigate an impact to less than significant or may not be implemented by other parties) and discloses, for CEQA compliance purposes, that potentially significant environmental impacts may be unavoidable.

B. 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. An EIA for broad programs cannot be as detailed as it can be for specific projects (Title 14 California Code of Regulations [CCR] Section 15146). For example, the assessment of a construction project would be naturally more detailed than one concerning the adoption of a local general plan because construction-related effects can be predicted with more accuracy (Title 14 CCR Section15146[a]). Because this analysis addresses a broad regulatory program, a general level of detail is appropriate. However, this ~~Draft~~ Final EIA makes a rigorous effort to evaluate significant adverse impacts

and beneficial impacts of the reasonably foreseeable compliance responses that could result from implementation of the Proposed Amendments and contains as much information about those impacts as is currently available, without being unduly speculative.

The scope of analysis in this Final EIA is intended to help focus public review and comments on the Proposed Amendments and, ultimately, to inform the California Air Resources Board (CARB or Board) of the environmental benefits and adverse impacts of the Proposed Amendments. This analysis specifically focuses on potentially significant adverse and beneficial impacts on the physical environment resulting from reasonably foreseeable compliance responses to implementation of the Proposed Amendments.

The analysis of potentially significant adverse environmental impacts of the Proposed Amendments is based on the following assumptions:

1. The analysis addresses the potentially significant adverse environmental impacts resulting from implementation of the Proposed Amendments compared to existing conditions.
2. The analysis of environmental impacts and determinations of significance are based on reasonably foreseeable compliance responses taken in response to implementation of the Proposed Amendments.
3. The analysis addresses environmental impacts 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 Proposed Amendments are programmatic. While the general locations of existing facilities and infrastructure are known, decisions by the regulated entities regarding compliance options and the precise location of the many components covered in the Proposed Amendments are unknown. Furthermore, attempting to predict decisions by entities regarding the specific location and design of infrastructure, source and production of materials, and other activities undertaken in response to implementation of the Proposed Amendments would be speculative (if not impossible) at this early stage, given the influence of other business and market considerations in those decisions. As a result, there is some inherent uncertainty in the degree of mitigation that would ultimately need to be implemented to reduce any potentially significant impacts identified in this ~~Draft~~ Final EIA. Consequently, this ~~Draft~~ Final EIA takes the conservative approach in its post-mitigation significance conclusions (i.e., tending to overstate the potential that feasible mitigation may not be implemented by the agency with authority to do so, or may not be sufficient) and discloses, for CEQA compliance purposes, that potentially significant environmental impacts may be unavoidable, where appropriate. It is also possible that the amount of mitigation necessary to reduce environmental impacts to below a significant level may be less than disclosed in this ~~Draft~~ Final EIA on a case-by-case basis. Specific actions undertaken to implement the Proposed Amendments would undergo

project-level environmental review and compliance processes as required at the time they are proposed. It is expected that many individual development projects would be able to feasibly avoid or mitigate potentially significant impacts to a less-than-significant level.

5. This ~~Draft~~ Final EIA generally does not analyze site-specific impacts when the location of future facilities or other infrastructure changes are speculative. However, the analyses in the documents prepared for this rulemaking do examine regional (e.g., local air district and/or air basin) and local issues to the degree feasible where appropriate. As a result, the impact conclusions in the resource-oriented sections of Chapter 4.0, “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 Proposed Amendments.

C. Background

The LCFS, established pursuant to Executive Order S-01-07, calls for a reduction in the carbon intensity (CI) of transportation fuels sold for use in California as one of the measures to meet the reductions in statewide greenhouse gas (GHG) emissions mandated by the California Global Warming Solutions Act of 2006 (Assembly Bill [AB] 32), codified at Health and Safety Code Section 38500 et seq.). Under the LCFS, CI is an expression of the combined carbon emissions from all production, distribution, and consumption steps in the life cycle of a transportation fuel—steps that occur due to demand for and consumption of transportation fuels in California. The LCFS is a performance-based standard that allows the market to determine how the overall CI of California’s transportation fuels would be reduced. Implementation of the LCFS regulation is intended to decrease GHG emissions from transportation fuels and to realize additional benefits, including diversification of the State’s fuels portfolio, reduced dependence on petroleum and the associated economic impacts of gasoline and diesel price spikes, greater innovation and development of cleaner fuels, and support for California’s ongoing efforts to improve ambient air quality.

On April 23, 2009, the Board approved the original LCFS regulation for adoption. The regulation became effective on January 12, 2010, and additional provisions became effective on April 15, 2010. The first year of the program, 2010, was intended solely as a reporting year for regulated parties to begin acclimating to the recordkeeping, reporting, and other administrative provisions by using the LCFS Reporting Tool and filing demonstrations of fuel pathways. These fuel pathways are the sum of the greenhouse gases emitted throughout each stage of a fuel’s production and use, also known as the “well-to-wheels” or "life cycle" analysis for the fuel. Actual implementation of the CI requirements began on January 1, 2011. The Board amended crude oil and other provisions in the original LCFS regulation in 2011, and those amendments took effect on November 26, 2012. In 2015, the Board re-adopted the LCFS to comply with a court order arising from a challenge to the original adoption and began implementation on January 1, 2016. In September 2018, the Board approved amendments to the LCFS regulation and Regulation on Commercialization of Alternative Diesel Fuels. The regulations became effective on January 4, 2019. The Board also approved further

amendments to the LCFS on May 27, 2020, to strengthen the cost containment provisions in the program and establish requirements that utilities spend a portion of their base credit proceeds on electrification projects in low-income, disadvantaged, and rural communities. Since the implementation of LCFS, the use of low carbon fuels in California has been increasing. Before LCFS, the only alternative fuels with market share were natural gas and ethanol. Between 2011 and 2022, renewable diesel, biodiesel, and renewable natural gas use has increased each year.[5] Since 2011, biodiesel use has grown over ten times—from 12 million to 163 million gallons per year; renewable diesel has increased from less than 2 million to 250 million gallons per year; and renewable natural gas use in vehicles has increased from 2 million to 87 million diesel gallon equivalent per year. Renewable natural gas, known as biomethane, has also increased as more methane capture projects are developed, resulting in near saturation of biomethane in the natural gas vehicle fuel pool.[6]

Between 2019 and 2022, electricity and hydrogen used as vehicle fuels increased by over 50%. Electricity has taken on an increasingly larger share of the fuel pool, earning 24% of LCFS credits in 2022, as electric vehicle charging has increased significantly in recent years. Hydrogen quantities, although still relatively small, nearly doubled from 2018 to 2019, and have more than quadrupled since 2018. Alternative jet fuel (AJF) quantities reported to the LCFS have increased as well. Since 2019, when AJF became eligible as an opt-in fuel in the LCFS, volumes have increased from about 1.8 million gallons in 2019 to about 11.6 million gallons in 2022, and those volumes continue to increase. Collectively, alternative fuels supported by the LCFS displaced over 3.9 billion gallons of petroleum fuel in 2022 in California.

Through ongoing innovation, fuel producers are achieving reductions in the carbon intensities of their fuel pathways. For example, corn ethanol producers in California have begun producing cellulosic ethanol by converting the residual corn kernel fiber using “bolt-on” additions to their existing facilities. “Bolt-on” facilities would include adding an additional piece of equipment to the existing framework, upgrading the processes without having to do any major reconfigurations. Moreover, new projects with the potential to generate credits are being explored at biofuel production facilities, waste management operations (e.g., landfills, livestock manure, and wastewater treatment plants), crude production fields (e.g., solar-generated electricity and steam), and petroleum refineries (e.g., production of renewable hydrogen and co-processing of renewable feedstocks). Several oil refineries in California have also converted their refining operations to process waste or vegetable oils instead of crude oil in order to produce renewable diesel and alternative jet fuel. Providers of electricity and hydrogen for battery electric and fuel cell vehicles are also increasing participation in the program. For example, fixed guideway systems are currently generating credits and utilities

[5] California Air Resources Board, *Low Carbon Fuel Standard Dashboard.* (Accessed on September 19, 2023). *https://ww2.arb.ca.gov/resources/documents/lcfs-data-dashboard*

[6] California Air Resources Board, *LCFS Quarterly Data Summary Spreadsheet*. (Accessed on September 14, 2023). *https://ww2.arb.ca.gov/resources/documents/low-carbon-fuel-standard-reporting-tool-quarterly-summaries*

are offering zero-emission vehicle (ZEV) rebates using LCFS credit revenue (CARB LCFS Utility Rebate Programs).

In 2016, the California legislature adopted Senate Bill (SB) 32, which builds on the progress of AB 32 by codifying a statewide target to reduce GHG emissions 40% below 1990 levels by 2030. This target was later superseded by the passage of AB 1279 (Muratsuchi, Chapter 337, Statutes of 2022), which established long-term statewide GHG reduction targets of reducing GHG emissions by 85% from a 1990 level and achieving carbon neutrality by no later than 2045. California's *2022 Climate Change Scoping Plan to Achieve Carbon Neutrality* (2022 Scoping Plan Update), adopted in December 2022 by CARB, provides the framework for the state to achieve this target through continuation of existing measures implemented under SB 32 and through the development of new strategies. The 2022 Scoping Plan Update identifies developing more stringent LCFS targets as one of the primary measures for achieving the State's GHG 2045 target of carbon neutrality.

To meet those goals, CARB staff developed the Proposed Amendments to improve California's long-term ability to support the consumption of increasingly lower-CI fuels and improve the LCFS program's overall effectiveness. The Proposed Amendments are described in greater detail in Chapter 2.0, "Project Description."

D. Environmental Review Process: Requirements under the CARB Certified Regulatory Program

CARB is the lead agency for the Proposed Amendments and prepared this ~~Draft~~ Final EIA pursuant to its regulatory program certified by the Secretary of the Natural Resources Agency (Title 14 CCR Section 15251[d]; Title 17 CCR Sections 60000–60008). In accordance with Public Resources Code [PRC] Section 21080.5 of CEQA, public agencies with certified regulatory programs are exempt from certain CEQA requirements, including but not limited to preparing environmental impact reports, negative declarations, and initial studies (Title 14 CCR Section 15250). CARB prepared this ~~Draft~~ Final EIA to assess the potential for significant adverse and beneficial environmental impacts associated with the Proposed Amendments, as required by CARB's certified regulatory program (Title 17 CCR Section 60005[b]). The resource areas from the CEQA Guidelines Environmental Checklist were used as a framework for assessing the potential for significant impacts (Title 17 CCR Section 60005[b]).

If comments received during the public review period raise significant environmental issues, staff will summarize and respond to the comments in the responses to comments prepared for this ~~Draft~~ Final EIA. The written responses to environmental comments will be considered prior to final action on the Proposed Amendments (Title 17 CCR Section 60007[a]).

E. Organization of This ~~Draft~~ Final EIA

This ~~Draft~~ Final EIA is organized into the following chapters to assist the reader in obtaining information about the Proposed Amendments and its specific environmental issues.

- **Chapter 1.0, "Introduction and Background,"** provides a project overview and background information, and other introductory material.
- **Chapter 2.0, "Project Description,"** summarizes the Proposed Amendments**,** the potential reasonably foreseeable compliance responses taken in response to the Proposed Amendments, and implementation assumptions.
- **Chapter 3.0, "Environmental and Regulatory Setting,"** contains the environmental and regulatory setting relevant to the environmental analysis of the Proposed Amendments.
- **Chapter 4.0, "Impact Analysis and Mitigation Measures,"** identifies the potential environmental impacts associated with the Proposed Amendments and mitigation measures for each resource impact area.
- **Chapter 5.0, "Cumulative and Growth-Inducing Impacts,"** analyzes the potential for cumulative effects of implementing the Proposed Amendments against a backdrop of past, present, and reasonably foreseeable future projects.
- **Chapter 6.0, "Mandatory Findings of Significance,"** discusses the potential for adverse impacts on human beings, cumulatively considerable environmental impacts, and whether the Proposed Amendments would have the potential to degrade the quality of the environment.
- **Chapter 7.0, "Alternatives Analysis,"** discusses a reasonable range of potentially feasible alternatives that could reduce or eliminate adverse environmental impacts associated with the Proposed Amendments.

F. Public Review Process for the Environmental Analysis

On February 12, 2023, CARB issued a Notice of Preparation for the Proposed Amendments, announcing that it would prepare an EA, which is the equivalent of an EIA. At a public workshop held on February 22, 2023, CARB staff discussed proposed regulatory concepts for the Proposed Amendments. Staff also described plans to prepare a Draft EIA for the Proposed Amendments and invited public feedback on the scope of environmental analysis.

In accordance with CARB's certified regulatory program, and consistent with CARB's commitment to public review and input, ~~this~~ the Draft EIA ~~is~~ was subject to a public review process. ~~This~~ The Draft EIA ~~will be~~ was posted for a public review period that ~~begins~~ began on January 5, 2024, and ~~ends~~ ended on February 20, 2024. This period complies with requirements for a minimum of 45 days of public review (Title 17 CCR Section 60004.2[b][2]).

At the conclusion of the review period, staff ~~will~~ compiled public comments and responses on the Draft EIA made during the noticed 45-day comment period. As the result of changes to the project description and new analysis in the air quality and GHG sections, CARB recirculated those portions of the EIA. The Recirculated EIA was released on August 16, 2024, for a 45-day public review and comment period that closed on September 30, 2024.

At the conclusion of the Recirculated EIA review period, staff complied public comments and responses on the Recirculated EIA ~~(or during any further comment period if CARB determines recirculation of this Draft EIA is necessary)~~, and prepared a final hearing package, which includes the Final EIA and response to environmental comments, for the Proposed Amendments for the Board's consideration at a public hearing. If the final Proposed Amendments are adopted by the Board, a Notice of Decision will be filed with the Secretary of the Natural Resources Agency and will be posted on CARB's regulatory webpage.

This page intentionally left blank.

2.0 Project Description

A. Introduction

CEQA requires agencies to evaluate the environmental impacts of a project, or the "whole of an action," when conducting CEQA analyses (see CEQA Guidelines Section 15378). The CEQA "project" for purposes of this Recirculated Draft EIA includes the Proposed Amendments. While the Proposed Amendments constitute the "project" for CEQA purposes (CEQA Guidelines Section 15378), this document also uses the term "project" to refer to reasonably foreseeable activities, such as construction of fuel facilities that might be undertaken in response to the Proposed Amendments.

This chapter provides a background summary of the existing LCFS regulation and summarizes the Proposed Amendments, including establishing appropriate average carbon intensity (CI) requirements through 2045 and other changes, updates, and improvements to existing provisions, models, and procedures. Additional details about the amendments are available in the Initial Statement of Reasons (ISOR),[7] ~~and in~~ the 15-day ~~Notice~~ package released August 12, 2024, and the second 15-day package released October 1, 2024. The third part of this chapter describes an illustrative, reasonably foreseeable compliance response scenario resulting from these Proposed Amendments. This information provides a basis for the subsequent discussion of the reasonably foreseeable environmental effects of the Proposed Amendments in Chapter 3.0, as required by CEQA (PRC Section 21159).

For a detailed description of how the Proposed Amendments are different from the current regulation as amended in 2018 and 2019, see Chapter II of the ISOR and the ~~15-day Notice package released August 12, 2024~~ two 15-day packages. For a description of the regulatory background driving the need for the Proposed Amendments, see Chapter III of the ISOR, Appendix D to the ISOR, and section D of this chapter.

B. Project Objectives

The current LCFS regulation is designed to reduce the CI of fuels used in California's transportation sector by requiring annual reductions in the volume-weighted average CI of transportation fuels used in the state. While fuels with higher CIs can and will be used, the LCFS regulation creates financial incentives for the development and use of fuels with lower CIs. Fuel reporting entities, such as fuel producers or distributors, must meet the annual CI standard through mechanisms such as producing lower-carbon fuels, buying such fuel from producers to sell on the market, purchasing credits

[7] California Air Resources Board, *Staff Report: Initial Statement of Reasons: Public Hearing to Consider the Proposed Amendments to the Low Carbon Fuel Standard.* December 19, 2023. https://ww2.arb.ca.gov/sites/default/files/barcu/regact/2024/lcfs2024/isor.pdf

generated by others, using banked credits generated in previous years, or a combination of these strategies. The LCFS regulation establishes three sets of performance standards that determine the treatment of each fuel used in California: 1) a standard for gasoline and alternative fuels that substitute for gasoline, 2) a standard for diesel fuel and its substitutes, and 3) a standard for fuels used as a substitute for fossil jet fuel. These standards were established to achieve an average 20% reduction in the CI of the statewide mix of transportation fuels by 2030 and all subsequent years, as compared to 2010, in line with California's 2030 GHG target to reduce GHG emissions by 40% from the 1990 levels as enacted through Senate Bill (SB) 32 (Pavley, Chapter 249, Statutes of 2016).

LCFS standards are expressed in terms of the CI of gasoline and diesel fuel and their substitutes, measured in grams of carbon dioxide equivalent per megajoule of fuel energy (gCO_2e/MJ). Each step in the life cycle of the fuel, including production, transportation, distribution, and consumption, is modeled by fuel pathway applicants and certified by CARB to determine the CI of the fuel.[8] In addition to the direct life cycle emissions, indirect land use change emissions are calculated on a fuel-by-fuel basis and included in their total CI.[9] The various factors used to determine a fuel's CI value are referred to as the fuel pathway.

The current LCFS regulation applies to most types of transportation fuels used in California,[10] including:

1. California reformulated gasoline,
2. California ultra-low sulfur diesel fuel,
3. Compressed or liquefied natural gas,
4. Electricity,
5. Compressed or liquefied hydrogen,
6. Any fuel blend containing hydrogen,
7. Any fuel blend containing greater than 10% ethanol by volume,
8. Any fuel blend containing biomass-based diesel,
9. Neat denatured ethanol,
10. Neat biomass-based diesel,

[8] California Air Resources Board, *CA-GREET3.0 Model and calculators*. (Accessed August 14, 2024). https://ww2.arb.ca.gov/resources/documents/lcfs-life-cycle-analysis-models-and-documentation
[9] California Air Resources Board, *LCFS Land Use Change Assessment.* (Accessed August 14, 2024). https://ww2.arb.ca.gov/resources/documents/lcfs-land-use-change-assessment
[10] As defined under Cal. Code Regs., tit. 17, § 95482(a).

11. Alternative jet fuel (AJF), and
12. Propane and any other liquid or non-liquid fuel not otherwise exempted from the regulation.

The regulatory requirements initially apply to California producers and importers of fuels, although the compliance obligations can be transferred to downstream owners of the fuel. Providers of certain low-CI fuels (i.e., electricity, hydrogen, and biogas fuels) are not subject to the LCFS unless they opt into the program to generate credits from the supply of the fuel to the California market.

Table 1 provides the CI reductions required under the current LCFS regulation. As indicated, CI is required to be reduced through a series of annual targets to reach the 2030 goal of a 20% reduction in the average CI of fuels in California compared to 2010.

Table 1: Carbon Intensity Reduction Requirements through 2030[11] (Relative to 2010)

	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Required CI Reduction (%)	6.25	7.5	8.75	10	11.2	12.5	13.75	15	16.25	17.5	18.7	20

Under the LCFS regulation, a fuel reporting entity is a California fuel producer, provider, or importer that must meet the annual compliance requirements of the LCFS regulation. Supplying a fuel with a CI that is below the standard in a given year generates credits; conversely, supplying a fuel with a CI above the standard generates deficits. Credits and deficits are determined on a quarterly basis. For a given annual compliance period, a fuel reporting entity's compliance obligation is determined by adding up all the quarterly deficits assessed to that party. A regulated party's annual compliance obligation is met when the regulated party demonstrates, via its annual report, that it possessed and has retired a number of credits that is equal to its compliance obligation. Credits are "tradeable." That is, a regulated party can purchase them from other program participants. Credits earned from CI reductions from diesel and diesel substitutes, the alternative fuels that substitute diesel, may be used to offset deficits generated from the supply of gasoline and gasoline substitutes, and vice versa. The credits are also "bankable" (i.e., surrendering credits that the fuel reporting entity already has accumulated in prior compliance periods is permissible). A fuel reporting

[11] California Air Resources Board, *Unofficial electronic version of the Low Carbon Fuel Standard Regulation*. 2020. *https://ww2.arb.ca.gov/sites/default/files/2020-07/2020_lcfs_fro_oal-approved_unofficial_06302020.pdf*

entity may also, under certain circumstances, pass the LCFS compliance obligation for that fuel to the buyer of the fuel as part of the sales transaction.

A fuel pool is the full collection of fuels that a fuel reporting entity produces in California for use in the State, imports into California for use in the State, and/or buys in California for use in the State. A fuel reporting entity's fuel pool may include gasoline, diesel, blendstocks, and substitutes. Blendstocks are components that are either used alone or are blended with other component(s) (e.g., ethanol) to produce a finished fuel. A blendstock generally has one or more fuel pathways. A substitute is a fuel that is used in place of the standard fuel for that type of application (e.g., diesel is typically used in heavy-duty vehicle applications, so a fuel substitute for that diesel might be compressed natural gas [CNG] or liquefied natural gas [LNG]).

The LCFS regulation designates a number of lower-carbon fuels as "opt-in" for which participation in the program is optional. These include:

1. Electricity,
2. Biogas CNG,
3. Biogas LNG,
4. Biogas liquefied compressed natural gas (L-CNG),
5. AJF, and
6. Renewable propane.

Providers of these fuels have no obligation to participate in the LCFS program. However, as previously noted, the LCFS regulation provides the opportunity to generate credits for these fuels, and credits could be sold to or surrendered by fuel reporting entities who need the credits to meet compliance obligations. Parties may opt into the LCFS program to become fuel reporting entities for these fuels. The provider of an opt-in fuel participates by registering as a fuel reporting entity and agreeing to be bound by LCFS compliance, recordkeeping, reporting, and other requirements.

The LCFS regulation also provides fuel reporting entities options to directly reduce the CI of conventional fuels and generate credits. The innovative crude provision, which provides credits for crude oil that has been produced or transported using innovative methods and delivered to California refineries for processing, promotes the development and implementation of innovative crude oil production methods that reduce greenhouse gas (GHG) emissions. Allowable methods are carbon capture and storage (CCS), solar steam generation, solar and wind electrical power generation, and solar heat generation. The Low-Complexity/Low-Energy-Use Refinery provision provides credits to small refineries. To incentivize GHG reductions at refineries, the LCFS regulation also established the Renewable Hydrogen Refinery Credit Program and the Refinery Investment Credit Program.

The LCFS Reporting Tool (LRT) is an accounting system that records the credit or deficit "obligation" based on the type of fuel and business transactions. The LRT calculates the overall credit/deficit for the quarter based on the annual standard, fuel CI, volume, and Energy Economy Ratio (EER), if applicable. EERs are used to adjust credits associated with a vehicle's fuel efficiency. On an annual basis, fuel reporting entities are required to review these submittals and submit an annual report verifying the validity of the four quarterly reports. The results are used to determine compliance with LCFS targets for that given year. The LCFS regulation requires fuel reporting entities to use the LRT to report fuel and credit transactions subject to the LCFS regulation.

C. Objectives of the Proposed Amendments

There have been several major new climate statutes enacted and executive orders issued since the last major LCFS rulemaking in 2018. In 2022, Governor Gavin Newsom signed several climate bills, including Assembly Bill (AB) 1279 (Muratsuchi, Chapter 337, Statues of 2022),[12] SB 905 (Caballero, Chapter 359, Statutes of 2022),[13] and SB 1020 (Laird, Chapter 361, Statutes of 2022).[14] A particular focus on the transportation sector was established through Executive Order N-79-20,[15] which established a State goal that sales of all new passenger vehicles be zero emission by 2035 and that 100% of medium- and heavy-duty vehicles in the State be zero emission by 2045 for all operations where feasible and by 2035 for drayage trucks. The 2022 Scoping Plan for Achieving Carbon Neutrality (2022 Scoping Plan Update),[16] approved by the Board in December 2022, lays out a cost-effective and technologically feasible path to achieve these targets and achieve carbon neutrality by 2045. In order to implement the 2022 Scoping Plan Update, California needs to reduce emissions by driving down fossil fuel demand in transportation, transitioning to zero-emission technology wherever feasible, and increasing the supply of low-carbon alternative fuels as quickly as possible.

The primary objectives of the Proposed Amendments are:

[12] AB 1279 requires an 85% reduction in anthropogenic GHG emissions below 1990 levels by 2045.
[13] SB 905 requires CARB to establish a program and adopt regulations related to the development of carbon capture, removal, and storage projects.
[14] SB 1020 includes new benchmarks of 90% clean electricity by 2035 and 95% by 2040 ahead of the 100% goal by 2045.
[15] State of California Executive Department, Executive Order N-79-20. September 23, 2020. https://www.gov.ca.gov/wp-content/uploads/2020/09/9.23.20-EO-N-79-20-Climate.pdf
[16] California Air Resources Board, *2022 Scoping Plan for Achieving Carbon Neutrality*. November 16, 2022. https://ww2.arb.ca.gov/sites/default/files/2022-12/2022-sp_1.pdf

1. Improve California's long-term ability to support the production and use of increasingly lower-CI transportation fuels and to improve the program's overall effectiveness;
2. Update the annual carbon intensity benchmarks through 2030 and establish more stringent post-2030 benchmarks in alignment with the 2022 Scoping Plan;
3. Increase the flexibility of the program to adjust for potential future market over-performance by including a mechanism that would automatically accelerate the compliance targets under certain conditions;
4. Include a step-down in the near-term CI target to further support ambition;
5. Incentivize fuel production and refueling infrastructure buildout needed to meet California's long-term climate goals and reduce dependence on petroleum fuels, including opportunities to leverage federal funding for low-carbon hydrogen production and zero emission vehicle (ZEV) fueling, and support the transition of biomethane fuel pathways for combustion out of transportation;
6. Update standard values in the regulation, including emission factors, as well as life cycle assessment (LCA) modeling tools to use more detailed or recent data; and
7. Streamline implementation of the program.

D. Description of the Proposed Amendments to the Low Carbon Fuel Standard

1. Strengthen the Annual Carbon Intensity Benchmarks Pre- and Post-2030

The current LCFS targets a 20% reduction in average fuel CI by 2030 and maintains that target for all subsequent years. Staff is proposing to increase the stringency of the LCFS program by strengthening the annual CI benchmarks pre- and post-2030. Strengthening the CI benchmarks would result in faster decarbonization of the transportation fuel pool, which is needed for alignment with AB 1279 (carbon neutrality and an 85% reduction from a 1990 statewide GHG inventory by 2045) and the ambition called for in the 2022 Scoping Plan Update. The 2022 Scoping Plan Update lays out a path to achieve state goals and achieve carbon neutrality by 2045. There is an opportunity to strengthen the CI benchmarks because investment in low-carbon fuel production and adoption of electric vehicles (EVs) have outpaced projections, resulting in "overperformance" in the low-carbon fuels market relative to the current targets. Staff is proposing to strengthen the pre-2030 CI benchmarks and create post-2030 CI

benchmarks to signal long-term support for LCFS, which will help signal a strong LCFS market for the more infrastructure-heavy investment needed (e.g., refinery conversions and CCS). Staff is proposing a 30% CI reduction target in 2030 and a 90% reduction target in 2045 to accelerate GHG reductions in transportation fuel to align with 2022 Scoping Plan Update direction. Scenarios modeled both in-house[17] by CARB and by external stakeholders[18] indicate that a reduction of 30% by 2030 and 90% by 2045 is achievable and necessary to decarbonize the transportation fuels sector and support the state's broader climate goals.

Table 2 provides the proposed CI reductions from 2024 through 2045 from a 2010 baseline. The proposed amendments will extend the LCFS targets to meet a 90% reduction in fuel CI from a 2010 baseline by 2045 while updating the 2030 reduction to 30% from 20%. CI reduction targets have historically been listed in comparison to 2010, the year before the first CI reductions began. This is distinct from the use of 2023 as the CEQA baseline for the purposes of the Proposed Amendments.

Table 2: Proposed Carbon Intensity Reduction Requirements from 2024 through 2046 (Relative to 2010)

Year	Proposed CI Reduction Target
2024	12.5%
2025	22.7%
2026	24.2%
2027	25.6%
2028	27.1%
2029	28.6%
2030	30.0%
2031	34.5%

[17] California Air Resources Board, *Low Carbon Fuel Standard 2023 Amendments: Standardized Regulatory Impact Assessment (SRIA*). September 8, 2023. *https://ww2.arb.ca.gov/sites/default/files/2023-09/lcfs_sria_2023_0.pdf*

[18] ICF Resources LLC, *Analyzing Future Low Carbon Fuel Targets in California: Initial Results for Accelerated Decarbonization, Central Case*. Submitted to Auto-Acceleration Mechanism for the Low Carbon Fuel Standard Public Comment Docket. June 30, 2023. *https://ww2.arb.ca.gov/form/public-comments/submissions/4306*

Ro, J.W., Murphy, C.W., & Wang, Q., *Fuel Portfolio Scenario Modeling (FPSM) of 2030 and 2035 Low Carbon Fuel Standard Targets in California*. UC Davis ITS Research Report UC-ITS-RIMI-3L, Davis CA. DOI: 10.7922/G2S46Q8C. *https://escholarship.org/uc/item/6f2284rg*

Bushnell, J., Lade, G., Smith, A., Witcover, J. & Xiao, W., *Energy Institute at Haas WP 340: Forecasting Credit Supply Demand Balance for the Low-Carbon Fuel Standard Program*. August 2023. *https://haas.berkeley.edu/wp-content/uploads/WP340.pdf*

Year	Proposed CI Reduction Target
2032	39.0%
2033	43.5%
2034	48.0%
2035	52.5%
2036	57.0%
2037	61.5%
2038	66.0%
2039	70.5%
2040	75.0%
2041	78.0%
2042	81.0%
2043	84.0%
2044	87.0%
2045	90.0%
2046	90.0%

Additionally, the growth in credit generation in the past few years demonstrated the challenge of anticipating potential technological advancements and market dynamics in the long run when establishing CI benchmarks. To accommodate documented rapid advances in transportation fuel decarbonization that have already occurred, and which could occur again, the Proposed Amendments include both a near-term step-down in CI benchmark stringency (9%) in 2025, and an Automatic Acceleration Mechanism (AAM).

Staff is proposing to include an Automatic Acceleration Mechanism (AAM) to increase the stringency of the CI benchmarks of the program when specific regulatory conditions are satisfied. Under the current staff proposal, if activated, the AAM would advance the upcoming year's CI benchmark, and all subsequent years by one year. This can only be triggered once a year. For example, if the AAM is activated in 2029 based on 2028 LCFS reporting, the 2030 CI reduction target would be increased to 34.5%. An AAM can support the deeper transportation sector decarbonization needed through mid-century by increasing regulatory clarity for the market, acting alongside existing provisions that also help to provide program certainty, such as the maximum credit price and the Credit Clearance Market (CCM). The AAM would be triggered when the credit bank to average quarterly deficit ratio exceeds three and credit generation exceeds deficit generation based on the prior ~~year's~~ four quarters' reporting.

Market conditions that meet both conditions would result in the AAM being activated. As described above, this reasonably foreseeable compliance response would result in future compliance targets moving forward one year. Impacts to resource categories in

this EIA would not change in a scenario where the AAM is activated but could potentially happen a year earlier than under the existing proposed CI targets schedule. As such, the compliance responses and impacts to resource categories in this EIA describe the impacts associated with the Proposed Targets and a situation in which the AAM is activated and the CI target schedule is accelerated by one year.

2. Biomethane Crediting

Biomethane is currently eligible to generate credits in the LCFS program when used as a transportation fuel. Capturing methane is critical for achieving California's climate targets, including SB 32[19] and SB 1383 (Lara, Chapter 395, Statutes of 2016),[20] which focuses on 2030 climate goals, and AB 1279, which focuses on 2045 climate goals. However, the 2022 Scoping Plan Update indicates biomethane will be primarily needed for sectors outside the transportation sector instead of its current use as a vehicle fuel, given the overall path to zero-emission vehicle technology and the proliferation of low-carbon liquid fuels available in the near term. Therefore, staff is proposing the following amendments to biomethane crediting, which will provide strong support for investment in biomethane capture in the near term, while aligning with the broader direction of the 2022 Scoping Plan Update to shift to production of hydrogen or as an end-use in other sectors outside transportation.

a) Phase Out Biomethane Combustion Crediting

For projects that break ground after December 31, 2029, staff is proposing to phase out pathways for crediting biomethane used in CNG vehicles after December 31, 2040. Pathways for biomethane used to produce renewable hydrogen would be eligible to receive credits until 2045. This concept aligns with the overall transition to non-combustion transportation technology highlighted in the 2022 Scoping Plan Update, as well as the shifting of biomethane resources to hydrogen production.

b) Avoided Methane Emissions

Staff is proposing to reduce the total number of crediting periods for avoided methane emissions crediting to two, rather than three consecutive 10-year periods for projects that break ground prior to January 1, 2030. Projects that are certified before the effective date of the regulation will continue to be allowed three consecutive 10-year crediting periods. Staff also proposes~~, and~~ to include new regulatory provisions for projects that break ground after December 31, 2029. For projects that break ground after December 31, 2029, staff is proposing that pathways for avoided methane

[19]Forty percent reduction from a 1990 statewide GHG inventory by 2030.[20] Forty percent reduction in methane, 40% reduction in hydrofluorocarbons, and 50% reduction in anthropogenic black carbon below 2013 levels by 2030.

[20] Forty percent reduction in methane, 40% reduction in hydrofluorocarbons, and 50% reduction in anthropogenic black carbon below 2013 levels by 2030.

crediting be available until 2040 for biomethane used as a transportation fuel, and until 2045 for biomethane used to produce hydrogen.

c) Deliverability Requirements

Staff is proposing that pathways for bio-CNG, bio-LNG, and bio-L-CNG vehicles would need to demonstrate physical flow to California after December 31, 2037, if the ~~Executive Officer approves a gas system map identifying interstate pipelines and their majority directional flow based on specified flow data by July 1, 2026~~number of unique Class 3-8 ZEVs reported or registered in California exceeds 132,000 ZEVs or NZEVs on December 31, 2029 The proposed deliverability requirements also would not apply to biomethane matched to hydrogen fuel pathways participating in the LCFS program.

d) Biomethane Book-and-Claim

Staff is proposing to allow book-and-claim accounting of biomethane to produce electricity for electric vehicle charging, provided the electricity is generated using a fuel cell. This proposal increases flexibility for biomethane projects to produce low-CI electricity and supports California's ZEV goals, while also prioritizing electricity generated using non-combustion technology.

3. Project-Based Crediting

Staff is proposing changes to the project-based crediting provisions to align with the 2022 Scoping Plan Update to reduce GHG emissions across the economy while recognizing the broader trend away from fossil fuel production in tandem with demand. Specifically, staff is proposing to phase out crediting of petroleum projects by 2040.

In addition, staff is proposing to limit LCFS credit generation eligibility for direct air capture (DAC) projects to projects located in the United States. Focusing on projects located in the United States would align the LCFS with federal incentives for DAC projects, which also requires projects be within the United States and would support achieving national and State climate goals.

4. Book-and-Claim of Hydrogen

Indirect accounting via book-and-claim of low-CI hydrogen used as a transportation fuel or in the production of a transportation fuel is not allowed within the scope of the current book-and-claim provisions. However, the 2022 Scoping Plan Update calls for accelerating the transition to hydrogen use in support of achieving carbon neutrality. To incentivize the production and use of low-CI hydrogen, staff proposes to expand the existing book-and-claim provisions to include low-CI hydrogen injected into a dedicated hydrogen pipeline physically connected to California.

5. Remove Eligibility of Fossil Fuel-Derived Hydrogen

Staff is proposing to remove credit generation eligibility for hydrogen produced from fossil fuels, effective January 1, 203 beginning of 2035~~end of 2030~~. The 2022 Scoping Plan Update identified a need for low-carbon, renewable hydrogen for the transportation sector (among other sectors) to displace fossil fuels in support of achieving the State's greenhouse gas emission reduction goals. The 2022 Scoping Plan Update scenario did not include hydrogen produced from fossil fuels, with or without carbon capture as low-carbon, renewable hydrogen. Instead, it identified as low carbon and renewable hydrogen produced through steam methane reformation of biomethane, electrolysis, and biomass gasification. Staff is proposing to remove LCFS crediting eligibility for hydrogen produced from fossil fuels at the beginning of 2035~~end of 2030~~ to align with the current operational timeline for projects funded under the hydrogen hubs grants, which will expand the supply of renewable hydrogen in California.

6. Capacity Crediting for Zero-Emission Vehicle Infrastructure for Heavy-Duty Vehicles

Staff is proposing to expand the current ZEV infrastructure crediting provisions by adding crediting for heavy-duty (HD) vehicle infrastructure. Traditionally, the LCFS provided credits for dispensed fuel, but in the 2018 LCFS rulemaking, the Board approved the ZEV infrastructure provisions to support rapid buildout of hydrogen refueling and fast charging stations. Stations approved under the Hydrogen Refueling Infrastructure (HRI) and Direct Current Fast Charging Infrastructure (FCI) provisions can receive additional credits in the early years of ZEV adoption when fewer vehicles are on the road, based on their unused refueling capacity. The programs have been successful to date in incentivizing ZEV infrastructure buildout in the light-duty vehicle sector, and staff is proposing to develop a similar provision to support ZEV refueling of HD ZEVs. This provision is identified as a key strategy for supporting the transition to HD ZEVs in the 2022 Scoping Plan Update, and infrastructure development is key to implementation of critical vehicle regulations such as the Advanced Clean Fleets regulation.[21] A HD HRI and FCI provision would encourage buildout of an early network of heavy-duty truck refueling stations by supporting station economics while the HD ZEV populations are low and would naturally phase out as refueling demand increases.

7. Continue Capacity Crediting for ZEV Infrastructure for Light-Duty Vehicle and Include Medium-Duty Vehicle Charging

The current light-duty ZEV infrastructure crediting provisions sunset at the end of 2025. As the State transitions to widespread ZEV deployment, it is imperative that light-duty refueling infrastructure incentives be expanded to include medium-duty vehicles, which

[21] California Air Resources Board, *Advanced Clean Fleets Board Resolution 23-13.* April 27, 2023. *https://ww2.arb.ca.gov/sites/default/files/barcu/board/res/2023/res23-13.pdf*

have similar refueling needs and characteristics. Therefore, staff is proposing to modify the existing HRI and FCI provisions to combine both light--duty vehicle and medium-duty vehicle refueling. These provisions are designed to accelerate deployment of ZEV infrastructure both for consumers and businesses with light- and medium-duty vehicles.

8. Changes to Eligibility of Biomass-based Diesel

Staff is proposing to stop accepting applications for new biomass-based diesel fuel pathway applications starting on January 1, 2031, contingent on successful implementation of California's medium- and heavy-duty (MHD) zero emission vehicle regulations. This proposal is consistent with the State's goal of transitioning to zero emission technology and aligns biofuel policy with progress on ZEV deployment in the diesel pool. The proposal does not phase out existing biomass-based diesel fuel pathways, which may still report under their previously-certified CIs.

In addition, staff is proposing to provide credits for biomass-based diesel produced from virgin soybean, canola, and sunflower ~~oil and canola~~ oil for up to 20 percent of annual biomass-based diesel reported on a company-wide basis. Quantities of soybean, ~~or~~ canola, and sunflower oil biomass-based diesel in excess of 20 percent would be given the carbon intensity for the applicable year's diesel fuel benchmark from Table 2 of the LCFS regulation, or the certified carbon intensity of the applicable fuel pathway; whichever is higher. As manufacturers comply with increasing ZEV sales requirements and as California prioritizes waste feedstocks and advanced decarbonization technologies, the State must ensure that other regions are able to also access increasing volumes of low-carbon alternative fuels. California expects that overall diesel demand will decline in the State over the coming decades due to the State's portfolio of ZEV and clean fuel polices. This proposed addition allows for California to displace up to 100% of the State's current fossil diesel demand with cleaner alternative diesel. The proposed addition also avoids sending a long-term signal for virgin vegetable oils~~soy or canola oil~~ to serve California demand. For companies that already have a certified fuel pathway prior to the effective date of the amendments and for which the percentage of biomass-based diesel produced from virgin soybean, ~~oil~~ or canola, and sunflower oil was greater than 20 percent of combined reported biodiesel and renewable diesel quantities for that company's 2023 LCFS reporting, this provision would take effect starting January 1, 2028, to provide time to adjust feedstock supply contracts as needed. All other companies would be subject to this requirement upon the effective date of the amended regulation.

9. Provide an Opportunity for Automakers to Generate Base Credits

Staff is proposing to allow original equipment manufacturers (OEMs) of zero emission vehicles to generate a percentage of base credits for residential electric vehicle charging. OEMs would be required to utilize these credit revenues to promote and support transportation electrification in California. The Executive Officer would have

discretion to allow credit generation for OEMs based on the percentage of ZEV sales of model year 2024 vehicles.

10. Sustainability Criteria for Crop-Based Biofuels

The current LCFS regulation uses land use change emissions estimates by feedstock, which were last assessed between 2013-2015 through an extensive expert workgroup. The existing regulatory provisions make fuel pathways from crop-based feedstocks more carbon intensive and disincentivize sourcing biofuel feedstocks from crops and regions with land-use change risks.

To reduce the risk that rapid expansion of biofuel production and biofuel feedstock demand could result in deforestation or adverse land use change, CARB staff are proposing additional guardrails on the use of crop-based feedstocks for biofuel production. Specifically, CARB staff are proposing to require pathway holders track crop-based and forestry-based feedstocks to their point of origin and require independent feedstock certification to ensure feedstocks are not contributing to impacts on other carbon stocks like forests. CARB staff are also proposing to remove palm-derived fuels from eligibility for credit generation, given palm oil has been demonstrated to have the highest risk of being sourced from deforested areas. Palm-derived fuel transactions have not been reported under the program or received any credits to-date.

Staff is proposing that sustainability requirements take effect in phases. The first milestone beginning in 2026 is for fuel producers to collect and submit supply chain data including spatial data of farm boundaries where feedstocks are sourced. Additionally, fuel producers must maintain an attestation letter signed by the fuel producer that assures feedstocks have not been sourced from lands that were converted after 2008.

The next milestone beginning in 2028 is for fuel producers to obtain third-party certification that, at a minimum, ensures feedstocks are not sourced on lands converted after 2008. Staff proposes that the list of certification schemes recognized by the European Union Renewable Energy Directive (EU RED) be automatically accepted for these purposes, owing to similar no-deforestation/no-conversion requirements under the EU RED. Other certification schemes that meet the criteria listed in subsection 95488.9(g)(5) will also be considered for approval by the Executive Officer. The final milestone beginning in 2031 requires sustainability certification of all biomass feedstocks or process energy by a third-party approved by the Executive Officer. Additionally, staff proposes to add specification of the geographic region to Table 6, of the current regulatory text,[22] identifying where land use change (LUC) carbon intensity was modeled for specific feedstock/fuel combinations. Table 6 LUC values were estimated through the GTAP and AEZ-EF modeling framework developed by CARB with input from an expert working group in 2010 and were updated during CARB's re-

[22] Cal. Code Regs., tit. 17, § 95488.3.

adoption of the LCFS program in 2015. GTAP uses economic and trade data to model the land requirements—i.e., the amount of forest, pasture, and cropland converted—to meet an increase in biofuel demand. It estimates these market-mediated land conversions within a focal region (i.e., domestic LUC) and elsewhere (i.e., world-wide LUC), which are used as inputs for the AEZ-EF model to estimate the associated GHG emissions based on regional carbon stocks. LUC carbon intensity for feedstocks from regions other than the regions modeled may not be equivalent with the Table 6 values for those feedstocks shown. The LUC carbon intensity of a given crop feedstock may vary widely based on land use practices and local carbon stocks in the region where it is produced.

To reflect this variability, the Proposed Amendments incorporate a mechanism to assign more conservative LUC carbon intensity values to feedstock/fuel combinations from regions with higher LUC risk. This proposal is informed by the increasing number of fuel pathway applications CARB has received involving crop-based feedstocks from regions other than those previously modeled in 2015 that may not demonstrate equivalency with Table 6 values. Staff's proposal aims to provide more granularity to LUC carbon intensity values. For feedstock/fuel combinations from regions not listed in the updated Table 6, staff proposes to conduct an empirical assessment to determine a conservative LUC value based on historical land conversions for a given feedstock. The empirical/regional LUC carbon intensity of a given feedstock/fuel combination will be compared to its respective modeled/global LUC carbon intensity value in Table 6, and the more conservative value will be assigned, as regional LUC is a subset of total LUC.

11. Verification Requirements

Staff is proposing a number of changes to ease verification requirements for entities reporting to the LCFS program. First, staff proposes to increase the threshold for verification deferral for hydrogen- and electricity-based transactions from 6,000 to 10,000 credits, which helps to reduce the administrative burden of annual verification for these reporting entities. Staff also propose to delay the implementation of the verification for hydrogen- and electricity-based transactions by one year, such that verification begins in 2027 based on 2026 data, in order to give reporting entities additional time to obtain verification services. Finally, staff proposes to clarify the site visit requirement for verification services: in order to verify a Quarterly Fuel Transactions Report, a verifier must visit the central records location annually, and may not need to visit fuel dispensing facilities at all. These clarifications will provide reporting entities with more flexibility while maintaining the integrity of the LCFS verification process.

E. Compliance Responses Associated with the Proposed Amendments to the Low Carbon Fuel Standard

The following provides an illustrative, reasonably foreseeable compliance response scenario to achieve a 90% reduction in average CI by 2045 under the Proposed Amendments. As discussed above, the LCFS is based on a system of credits and relies

on a wide variety of possible compliance responses to achieve the proposed reductions in CI. Compliance with the LCFS is primarily met by increasing the availability and use of low-carbon transportation fuels in California and reducing the greenhouse gas intensity of the existing transportation fuels used in California. The compliance scenario described in this section is based on assumptions that CARB staff has determined to be reasonably foreseeable considering existing fuel types and sources, recent fuel supply trends, and anticipated production and transportation capacities in coming years. Actual compliance responses in response to the Proposed Amendments may vary from those set forth here because fuel producers and suppliers would ultimately determine how the required reduction in CI is achieved. Innumerable variations in these compliance responses could be posited as possible outcomes of the Proposed Amendments; therefore, the scenarios presented by staff are referred to as "illustrative" rather than "predictive" or "forecasted."

Staff conducted an in-depth scenario analysis that informed possible compliance schedules through 2045. The compliance responses described here are based on a reasonable range of assumptions, the modeling results, stakeholder feedback, and information obtained from market reports on alternative fuel technology development, and, therefore, provide a sound basis for evaluating the Proposed Amendments' reasonably foreseeable environmental impacts. Notably, the compliance responses may be described in more detail, as appropriate, in the specific impact discussions in Chapter 3.0, below.

The precise production location and quantities of alternative fuels cannot be predicted with certainty because market interest may inform future feedstock supplies and production locations. However, for the purpose of this analysis, ethanol could be sourced from the following locations:

1. Corn ethanol: South Dakota, North Dakota, Colorado, Idaho, Kansas, New Mexico, Nebraska, California, Minnesota, Montana, Iowa, Illinois, and Texas;
2. Sugarcane ethanol: Brazil and Central America;
3. Molasses ethanol: Brazil and Central America;
4. Sorghum ethanol: South Dakota, Kansas, Nebraska, California, and Texas;
5. Sorghum/corn/wheat slurry ethanol: Kansas; and
6. Cellulosic ethanol: plants could be sited near areas where feedstock is available (e.g., fuel treatment projects such as tree thinning and collection of forest litter, in the Sierra foothills, Midwest, Northern California, Oregon, and Washington, and crop residues within the Midwest and the Central

Valley of California). Additionally, bolt-on cellulosic ethanol processes can be added to corn ethanol facilities to convert corn kernel fiber to ethanol.

Feedstock sources for diesel substitutes and alternative jet fuel (AJF) could include:

1. Used cooking oil for renewable diesel, biodiesel, and AJF provided from sources throughout North America, Europe, and Southeast Asia;
2. animal fat for renewable diesel, biodiesel, and AJF from sources throughout North America, Southeast Asia, Australia, New Zealand, and Brazil;
3. Soy and canola farming and canola oil extraction in the United States, Canada and South America, followed by transportation of soy or canola oil to/within the U.S. (soy or canola oil could then be converted to biodiesel, renewable diesel or AJF and transported to blending stations for use in California motor vehicles; and
4. Biomethane that could be sourced primarily from landfills, dairy and swine farms, organic waste digesters (e.g., food scrap and urban landscaping waste), and wastewater treatment plants.

Feedstock sources for hydrogen production could include:

1. Natural gas provided from sources throughout North America;
2. Biomethane that could be sourced primarily from landfills, dairy and swine farms, organic waste digesters (e.g., food scrap and urban landscaping waste), and wastewater treatment plants;
3. Electricity for electrolysis; and
4. Biomass such as agriculture and forest residues for gasification.

Feedstock sources for electricity production could include:

1. Natural gas provided from sources throughout North America;
2. Biomethane;
3. Water reservoirs;
4. Solar, wind, tidal, and geothermal energy; and
5. Biomass such as agriculture and forest residues.

In addition, various potential innovative technologies could result in new pathways including biodiesel/renewable diesel sourced from algae, synthetic fuels from CCS

projects, creation of additional drop-in renewable biofuels from woody biomass from pyrolysis and Fischer-Tropsch synthesis. Because the LCFS regulation provides flexibility in the types of low-carbon fuels that can be credited, the ability to investigate and develop a full range of conceivable sources of fuels for the future is difficult; however, based on a series of factors grounded in CARB's current understanding of known and expected fuel pathways, CARB has developed one projected compliance response scenario to reflect what may reasonably occur under the Proposed Amendments. The following factors are considered to determine the types of fuels that would reasonably be expected for use in compliance with the proposed regulations:

1. CI value,
2. Feedstock cost and availability,
3. Regulatory requirements for zero-emission vehicle deployment
4. Compatibility with the existing vehicle fleet,
5. Physical/transportation routes for the fuel,
6. Available infrastructure, and
7. Economic feasibility.

CARB has developed a plausible scenario to quantify potential volumes and credits generated by low carbon alternative fuels and petroleum-based projects through 2045. This information is based upon the existing regulatory requirements for zero-emission vehicle deployment as well as reasonable assumptions on known fuel availability and is intended to provide an illustrative reasonably foreseeable scenario that could meet compliance standards. Figure 1 and Figure 2 contain plausible, illustrative quantities of alternative fuels and expected credit generation, respectively, through 2045 (see Appendix C-1 of the ISOR for additional background information used to create this illustrative scenario).

Figure 1: Low-CI Fuel Mix - Proposed Amendments

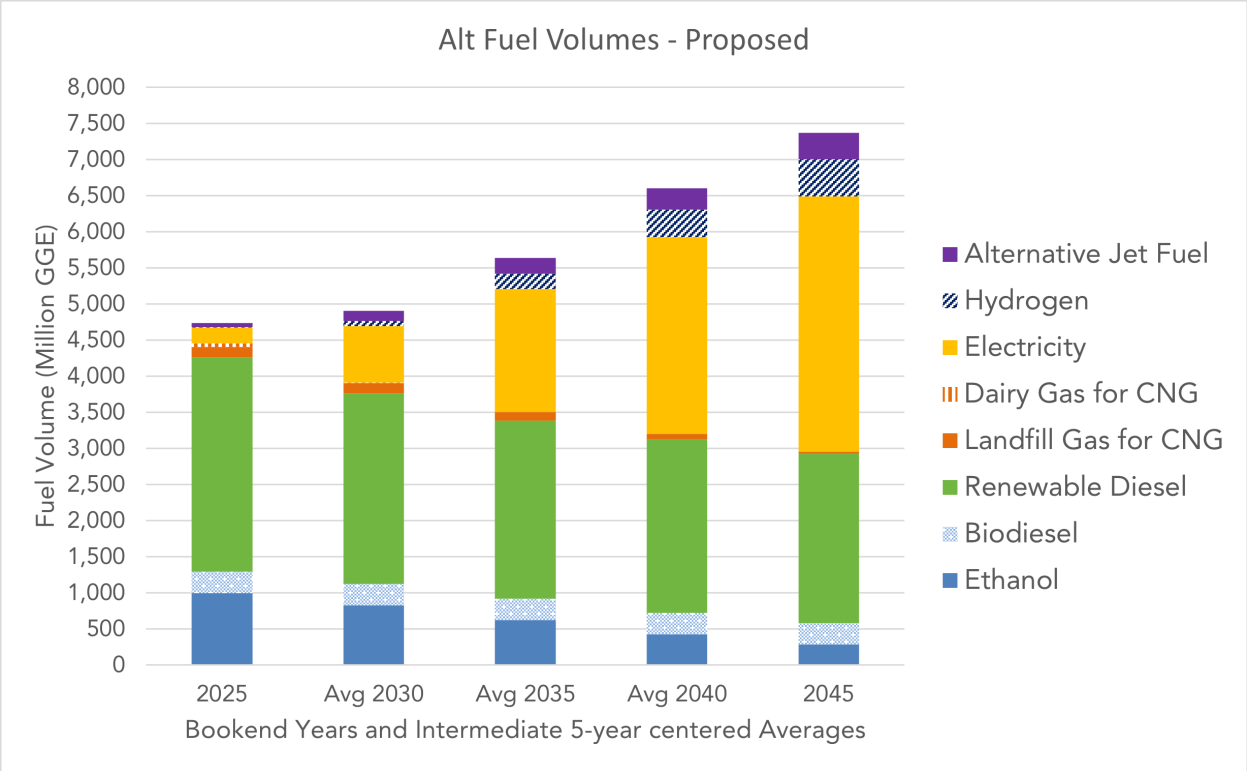
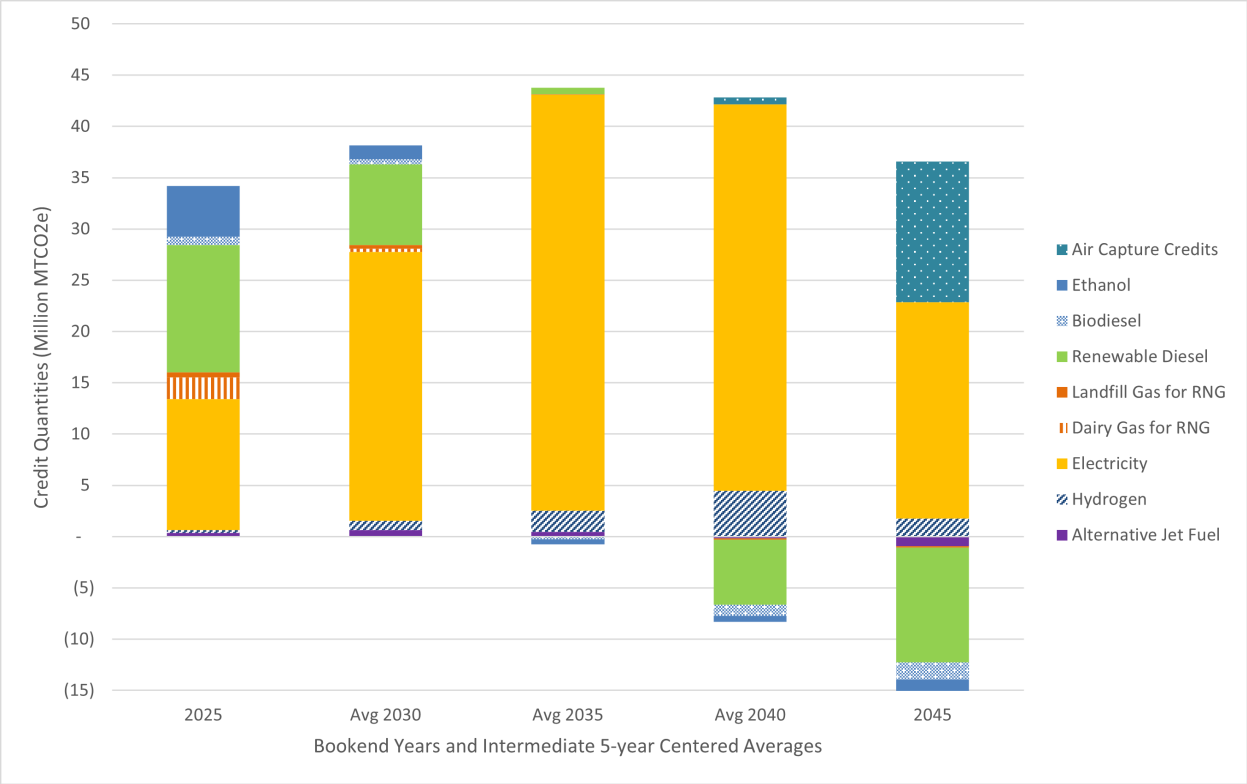


Figure 2: Credits Generated in the Proposed Amendments Scenario



1. Reasonably Foreseeable Technologies, Low-Carbon Fuel Types, and Feedstock Sources and Compliance Responses

The following section provides a discussion of the reasonably foreseeable technologies, low-carbon fuel types, and feedstock sources that could be developed to comply with the proposed CI requirements through 2045. In some cases, the fuels and feedstocks are already supplied to California under the current regulatory setting and would be expected to continue under the Proposed Amendments. Other reasonably foreseeable compliance responses that could occur because of implementation of the Proposed Amendments are also described.

a) Agriculture-Based Ethanol Production

1) Summary

Agriculture-based ethanol production involves the cultivation and production of crops for the primary use as ethanol fuel. Ethanol is currently blended in at up to 10% of gasoline by volume. CO_2 released when ethanol is used in vehicles is assumed to equal the CO_2 captured by the crop while growing and is considered “biogenic.” However, consideration of GHG emissions solely from fuel combustion does not provide a full life cycle analysis. GHGs are also emitted from ethanol production through agricultural

practices to produce the ethanol crop, such as tillage and harvesting, agricultural chemical production, transport of crops, and the manufacture of ethanol from the crops.

2) Compliance Responses

Staff does not anticipate significant increases in the quantity of ethanol under the proposed LCFS amendments, assuming that ethanol continues to be blended into gasoline at up to 10% by volume. Potential compliance responses to the Proposed Amendments could include incremental improvements to ethanol production methods to reduce the CI of the fuel as the program benchmarks become more stringent. In addition, ethanol producers may choose to install CCS technology to further reduce their CI.

b) Renewable Diesel, Biodiesel, and Alternative Jet Fuel

1) Summary

The terms renewable diesel and biodiesel are defined according to the process by which they are produced and, thereby, result in fuels that have different physical properties. Biodiesel and renewable diesel are primarily derived from similar lipid feedstocks, but use varying production methods (transesterification and hydrogenation, respectively) such that renewable diesel is chemically identical to fossil diesel, while biodiesel must be blended in at defined amounts.

Renewable diesel and biodiesel may both be produced from various non-petroleum renewable sources. Used cooking oil, distillers corn oil, animal fat, soybean oil, and canola oil are the most typical feedstocks. Currently, feedstocks for renewable diesel and biodiesel are provided from sources throughout North America, Europe, and Asia.

AJFs are “drop-in” fuels made from fossil or renewable sources, which can replace fossil jet fuel without the need to modify aircraft engines and existing fuel distribution infrastructure. AJFs are expected to primarily be derived from the same renewable sources as renewable diesel, and AJF and renewable diesel are often produced at the same facility.

2) Compliance Responses

Potential compliance responses to the Proposed Amendments could include increases in finished fuel production and transport and increased feedstock processing and transport. This may include construction and operation of new facilities to produce renewable diesel, biodiesel, and AJF and collection and distribution of feedstocks to supply these facilities, or replace existing petroleum refineries. Production plants may be stand-alone or co-located at petroleum refineries.

c) Compressed Natural Gas and Liquefied Natural Gas from Both Fossil and Renewable Sources (Biomethane)

1) Summary

Fossil compressed natural gas (CNG) and liquefied natural gas (LNG) consist mostly of methane and are drawn from gas wells or in conjunction with crude oil production. They can be used in place of gasoline, diesel fuel, and propane. While both are stored forms of natural gas, the key difference is that CNG is stored at high pressure (in gaseous form) whereas LNG is stored at low temperatures, becoming liquid in the process. LNG is often used for transporting natural gas and converted to CNG before distribution to the end user. In the LCFS, these fuels are most often produced from North American gas fields, landfills, and dairy digesters (i.e., biogas as described below). The life cycle emissions that make up the fuel pathway of a specific CNG or LNG fuel include those associated with natural gas recovery, processing, transport and distribution, compression at refueling stations, and use in internal combustion vehicles.

Certain businesses produce organic waste that could be repurposed into a clean, renewable fuel source called biogas. Biogas is the raw gaseous mixture comprised primarily of methane and carbon dioxide produced by the anaerobic decomposition of organic matter, and once the biogas is conditioned to pipeline-quality natural gas, it is considered biomethane, or RNG. Biomethane is most frequently produced from the following biogas sources:

- Landfills,
- Dairy and swine facilities,
- Food processing companies, and
- Wastewater treatment plants.

Landfills provide a source of biomethane that may be used to comply with the LCFS. In 2010, CARB approved the regulation to reduce methane emissions from municipal solid waste landfills. This measure requires the installation and proper operation of gas collection and control systems at active, inactive, and closed municipal solid waste landfills that control greater than 450,000 tons of waste-in-place and have been in operation after January 1, 1977. When derived from landfills, natural gas is first contained by using soil, compacted clay, geomembrane, biocovers, or other surface covers. Collection and control systems, which are typically vertical wells or horizontal trenches, are used to capture the gas. Performance standards for the gas collection and control systems and specific monitoring requirements ensure that the system is maintained and operated in a manner to minimize methane emissions. In addition, leak standards for gas collection and control system components, a monitoring requirement for wellheads, methane destruction efficiency requirements for most control devices, surface methane emission standards, and reporting requirements are included in the regulation.

Biomethane is also collected at dairy and swine operations, and many dairy or swine manure biogas-to-biomethane pathways, often referred to as biogas-to-Renewable Natural Gas (RNG) pathways, have been certified under the current LCFS. Such pathways incentivize dairy cattle and swine farms to install biogas control systems for manure management and incentivize using captured biomethane as a vehicle fuel or for conversion to electricity for EV charging, or as a feedstock for producing hydrogen. Though the LCFS incentivizes biogas control systems for manure management, for the reasons outlined below, changes to herd size, dairy expansion, or new dairy cattle facilities are speculative and not reasonably foreseeable compliance responses for the Proposed Amendments.

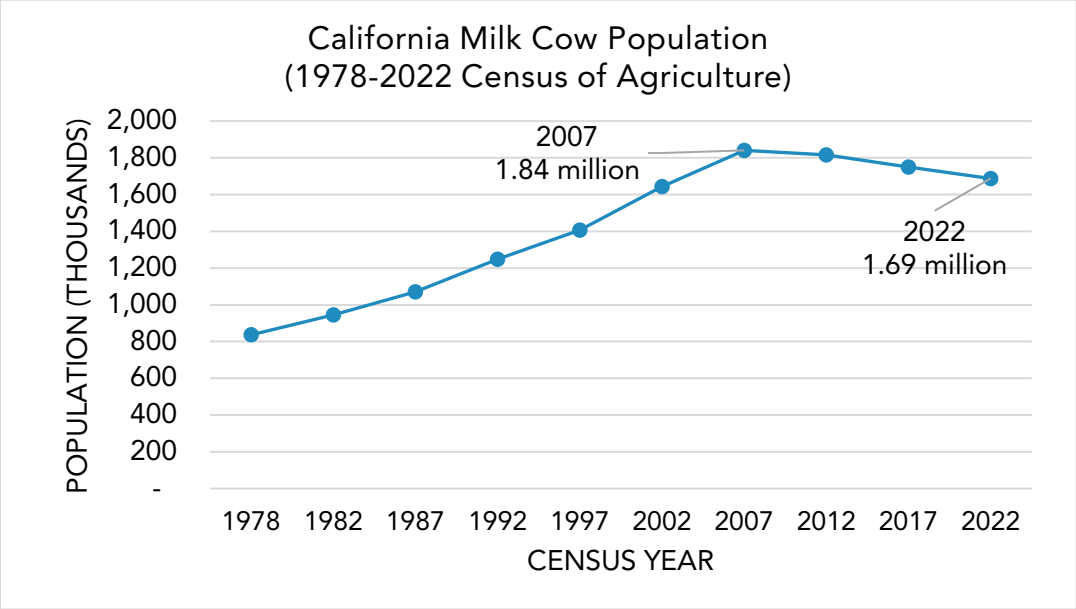
The U.S. dairy industry has shifted over the last quarter century to fewer, larger dairies to achieve economies of scale, and production efficiency improvements have allowed the sector to meet growing demand without increasing the total number of animals.[23,24,25] These overall trends are expected to continue in the near term, independent of the Proposed Amendments.

The total U.S. dairy cattle population has remained relatively flat over the past 25 years,[26,27,28,29,30] and statewide populations have declined in the majority of states, including California, where the number of milk cows reached a peak of 1.84 million

[23] Food and Agriculture Organization of the United Nations. *Dairy Market Review – Emerging trends and outlook in 2023*. 2023. Rome. https://www.fao.org/3/cc9105en/cc9105en.pdf
[24] Organization for the Economic Co-operation Development, *OECD-FAO Agricultural Outlook 2020-2029*. July 16, 2020. https://www.oecd-ilibrary.org/oecd-fao-agricultural-outlook-2020-2029-summary-english_ece4ff0c-en.pdf?itemId=%2Fcontent%2Fcomponent%2Fece4ff0c-en&mimeType=pdf
[25] Brito, L.F. et al. (2021) *Review: Genetic selection of high-yielding dairy cattle toward sustainable farming systems in a rapidly changing world*, Animal, Volume 15, Supplement 1, 2021, 100292, ISSN 1751-7311. https://doi.org/10.1016/j.animal.2021.100292
[26] United States Department of Agriculture, National Agricultural Statistics Service, *2002 Census of Agriculture – United States Data*, p. 20, 2002. https://agcensus.library.cornell.edu/wp-content/uploads/2002-United_States-UnitedStatesData-Table-17.pdf.
[27] United States Department of Agriculture, National Agricultural Statistics Service, *2007 Census of Agriculture – United States Data*, p. 21, 2007. https://agcensus.library.cornell.edu/wp-content/uploads/2007-United_States-st99_1_017_019.pdf.
[28] United States Department of Agriculture, National Agricultural Statistics Service, *2012 Census of Agriculture – United States Data*, p. 21, 2012. https://agcensus.library.cornell.edu/wp-content/uploads/2012-United-States-st99_1_017_019.pdf.
[29] United States Department of Agriculture, National Agricultural Statistics Service, *2017 Census of Agriculture – United States Data*, p. 23, 2017. https://www.nass.usda.gov/Publications/AgCensus/2017/Full_Report/Volume_1,_Chapter_1_US/st99_1_0017_0019.pdf.
[30] United States Department of Agriculture, National Agricultural Statistics Service, *2022 Census of Agriculture – United States Data*, p. 19, 2022. https://www.nass.usda.gov/Publications/AgCensus/2022/Full_Report/Volume_1,_Chapter_1_US/st99_1_017_019.pdf.

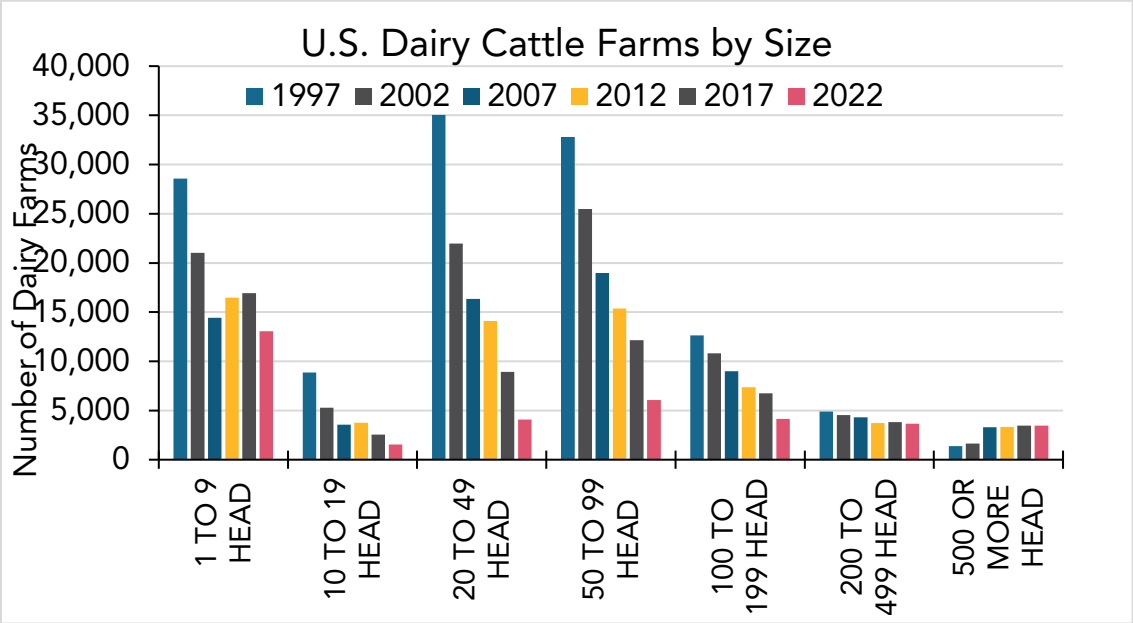
around 2008,[31] according to USDA Census of Agriculture (Ag Census).[32, 33] According to the most recent Ag Census conducted in 2022, since 2008, the number of milk cows in California has steadily declined year over year more than 8% to approximately 1.69 million, despite programs incentivizing digesters becoming available during that time.[34] Populations have grown significantly (greater than 5% increase) in only seven major dairy-producing states over the decade from 2012 to 2022 (Colorado, Idaho, Iowa, Kansas, Michigan, South Dakota, and Texas), some of which have implemented incentives or regulations that facilitate new dairy operations and expansions at existing operations. At the same time, the average farm size (head of mature cattle per farm) has increased in nearly all states across dairy herd size classes.[35]

Figure 3: California Milk Cow Population Growth Trends (1978 – 2022)



[31] California Air Resources Board, *California's 2000-2014 Greenhouse Gas Emission Inventory*, at p. 96, 2016. https://ww2.arb.ca.gov/sites/default/files/classic/cc/inventory/ghg_inventory_tsd_00-14.pdf.
[32] United States Department of Agriculture, National Agricultural Statistics Service, *2007 Census of Agriculture – State Data – California*, p. 21, 2007. https://agcensus.library.cornell.edu/wp-content/uploads/2007-California-st06_1_017_019.pdf.
[33] United States Department of Agriculture Research Service, Njuki, *U.S. Dairy Productivity Increased Faster in Large Farms and Across Southwestern States*, March 22, 2022. https://www.ers.usda.gov/amber-waves/2022/march/u-s-dairy-productivity-increased-faster-in-large-farms-and-across-southwestern-states/
[34] For example, the biofuels pathway through the LCFS program started in 2017, and the California Department of Food and Agriculture providing grants for digesters in 2014.
[35] Ibid, United States Department of Agriculture National Agricultural Statistics Service in Footnotes 23-27.

Figure 4: Shifting U.S. Dairy Cattle Farms by Size Trends (1997 – 2022)



The USDA Economic Research Service (ERS) has extensively analyzed consolidation and found that farms with larger herd size classes consistently earned substantially higher net returns than smaller herds.[36] Increasing herd sizes, coupled with increasing adoption of technologies to improve production efficiency,[37] result in improved financial returns per unit of milk produced for facilities achieving greater economies of scale, even at reduced commodity prices paid to producers.[38,39,40] Larger herd sizes allow facilities to generate increased commodity revenues while reducing the economic impact of production costs driven by a variety of factors including costs for animal feed, fuel, labor, technology adoption, environmental compliance, and commodity marketing

[36] MacDonald, James M., Jonathan Law, and Roberto Mosheim. *Consolidation in U.S. Dairy Farming,* ERR-274, July 2020. *https://www.ers.usda.gov/webdocs/publications/98901/err-274.pdf*. Net returns are essentially the difference between production costs and prices paid to producers. Production costs include costs paid by producers for feed, fuel, labor, veterinary services, and regulatory compliance, and can also be affected by broader economic conditions (e.g., inflation, interest rates, and economic uncertainty).

[37] Cole, John, *The Effects of Breeding and Selection On Lactation In Dairy Cattle,* Anim Front. June 2023; 13(3): 62–70..Published online June 14, 2023. *https://www.ncbi.nlm.nih.gov/pmc/articles/PMC10266753/*

[38] United States Department of Agriculture Economic Research Service, J. Macdonald, *Scale Economies Provide Advantages to Large Dairy Farms,* August 3, 2020. https://www.ers.usda.gov/amber-waves/2020/august/scale-economies-provide-advantages-to-large-dairy-farms/

[39] U.S. Department of Agriculture, Economic Research Service, Njuki, Eric, *Sources, Trends, and Drivers of U.S. Dairy Productivity and Efficiency*, ERR-305, February 2022. https://www.ers.usda.gov/publications/pub-details/?pubid=103300.

[40] U.S. Department of Agriculture, Economic Research Service, *Consolidation in U.S. Dairy Farming,* July 2020. https://www.ers.usda.gov/publications/pub-details/?pubid=98900

by spreading these costs across more animal units. This basic economic fact, and not actions taken in response to the LCFS, appears to drive decisions to expand. CARB staff have also extensively analyzed data from California dairies and concluded that there is no statistical relationship between the installation of digesters and dairy growth rates.[41] According to ERS, larger operations appear to realize lower average costs in part by investing in technology, such as computerized milking and feed delivery systems, to increase yields. Likewise, it is reasonable to assume that larger operations are more likely to invest in technology such as digesters and solid-liquid separation systems to improve manure management and reduce costs for synthetic fertilizer and animal bedding. Additionally, solid-liquid separation systems implemented in conjunction with anaerobic digestion systems can facilitate improved nutrient management and help reduce off-site export of excess nutrients and solids. Manure management is one of several practices identified by USDA that contribute to productivity and efficiency.[42]

Though the dairy sector has exhibited a trend of consolidating, whether, and, if so, how, a dairy operation would expand or a new dairy operation would be developed is speculative because it is subject to a fact-intensive, complex economic determination relying upon local, unforeseeable circumstances. In determining whether to develop a new dairy or expand an existing dairy, operators must consider a variety of factors, including development costs (including design, construction, equipment, ongoing operational, compliance, and financing availability and costs), potential revenue streams and return on investment, geography, available land appropriate for expansion and for manure application, and state and local environmental regulation. Existing operations may not be appropriate for expansion or installation of a digester because the land is not conducive, which is determined on a case-by-case basis. In addition, any herd size expansion requires significant environmental[43,44] and conditional use permitting, especially in California, which has enacted the most stringent environmental, air, and water quality protection regulations in the nation. In contrast, some states actively incentivize new dairies and expansions of existing dairies using economic benefits like

---

[41] California Air Resources Board, California Dairy Sector Workshop staff presentation, https://ww2.arb.ca.gov/sites/default/files/2024-08/CARB_Dairy_Sector_Workshop_Staff_Presentation_08-22-2024.pdf (Accessed August 12, 2024).
[42] U.S. Department of Agriculture, Economic Research Service, Njuki, Eric. February 2022. Sources, Trends, and Drivers of U.S. Dairy Productivity and Efficiency, ERR-305, https://www.ers.usda.gov/publications/pub-details/?pubid=103300
[43] San Joaquin Valley Air Pollution Control District (SJVAPCD) is responsible for air quality permitting most dairy operations in California. More information on the SJVAPCD permitting process and requirements available at: https://ww2.valleyair.org/permitting/dairy-permitting/
[44] **F**or example, confined animal facilities are subject to statewide water quality control regulations. See, *e.g.*, Cal. Code Regs., tit. 27, § 22560 *et. seq*. California State Water Resources Control Board regional board 5 is responsible for water quality permitting for most dairy operations in California. More information on regional board 5 permitting process and requirements available at: https://www.waterboards.ca.gov/centralvalley/water_issues/confined_animal_facilities/program_regs_requirements/dairy/

investment tax credits or regulatory changes such as those enacted in Iowa.[45] In addition, CARB has conducted extensive data collection and evaluation on California dairies, and the data evaluation did not find that the existing LCFS Regulation has caused dairy sector trends toward herd size expansion.[46] Evaluating the potential for the Proposed Amendments to cause herd size expansion would require making multiple inferences about what changes in the economic, regulatory, and operating landscape led to a change in a dairy's operation, which would require data about business owner future decision-making to differentiate and isolate. Any statewide animal population increases, facility herd expansions, or new dairy cattle facilities are expected to be the result of the above-described longstanding economic trends throughout North America or other factors and are not expected to be reasonably foreseeable compliance responses to the Proposed Amendments. Therefore, no further analysis is required. CARB will continue to use the best available data to improve methane reduction progress tracking, including monitoring changes in animal populations. Likewise, dedicated digesters at wastewater treatment plants are incentivized to capture methane and divert a portion of organic wastes from landfills and create useful byproducts, such as electricity and biofuels. Dedicated digesters process various types of organic wastes, including food waste and urban landscaping waste into biogas that can be upgraded to pipeline-quality RNG. It is anticipated that some of California's existing, and potentially new, wastewater treatment plants that operate anaerobic digesters may install additional equipment to collect, store, and co-digest regionally sourced organic wastes (i.e., food, cooking grease by-products, and agricultural produce waste), and install other equipment and infrastructure to capture methane gas and produce biogas that can be used for beneficial purposes. Captured biogas could potentially be used for on- or off-site electricity generation or cleaned and compressed for use as a natural gas pipeline supplement or as a vehicle fuel. The increased capture of methane and production of biogas would potentially result in the installation and operation of a variety of equipment and infrastructure at wastewater treatment plants and dairy and swine operations.

The Proposed Amendments support installation of biogas capture systems throughout North America. However, the proposed amendments require pathways for bio-CNG, bio-LNG, and bio-L-CNG vehicles in order to demonstrate physical flow to California after December 31, 2037, if the Executive Officer approves a gas system map identifying interstate pipelines and their majority directional flow by July 1, 2026, and phase out the existing avoided methane credit. These changes are likely to result in

---

[45] In 2021, Iowa enacted House File 522, which could allow dairies to exceed confinement capacity if they install an anaerobic digester to treat all manure. News sources also report the permitting and regulatory environment in South Dakota as "friendly" to agricultural operations such as dairy farms. See, e.g., https://www.argusleader.com/story/news/2021/03/04/south-dakota-emerging-major-player-dairy-industry-heres-why/4577419001/ (Accessed August 2, 2024).

[46] California Air Resources Board, *California Dairy Sector Workshop* staff presentation, https://ww2.arb.ca.gov/sites/default/files/2024-08/CARB_Dairy_Sector_Workshop_Staff_Presentation_08-22-2024.pdf (Accessed August 14, 2022).

some biomethane supplies shifting to other uses outside of the current predominant use as a combustion vehicle fuel.

2) Compliance Responses

Potential compliance responses to the Proposed Amendments would generally include construction of infrastructure needed to collect biogas and produce and transport biomethane. Biogas collected from the anaerobic digestion of organic matter (mostly methane and CO_2) would be purified to pipeline quality biomethane and injected into pipeline, or made available on site at the facility to fuel CNG-fueled vehicles. Pipeline-quality fuel from the purified biomethane (i.e., product gas) would be compressed and injected into the utility company's natural gas transmission grid at a connector located near the processing facility. Another potential compliance response is additional production of low-CI electricity or hydrogen from biomethane derived from dairy operations. The LCFS modeling assumes use of fuel cells to generate this electricity, which do not rely on combustion.

d) Cellulosic Ethanol

1) Summary

Cellulosic ethanol is a fuel derived from the structural parts of plant materials (e.g., plant stems, barks, and leaves composed largely of cellulose). As described above, under Agriculture-Based Ethanol Production, blending gasoline with ethanol could reduce the CI values of the finished fuels. Cellulosic ethanol could be produced from a variety of biomass sources, including, but not limited to, farmed trees, forest waste, grasses, and inedible parts of plants. In cellulosic ethanol plants, cellulose from biomass is converted into ethanol through an enzymatic process or a thermo-chemical conversion. The lignin portion could be burned in ethanol plants to provide needed steam. Some amount of extra electricity could be generated in cellulosic plants and exported to the electrical grid.

"Bolt-on" facilities are another way to produce cellulosic ethanol. These units produce cellulosic ethanol from the fiber of the corn/sorghum kernel and are added to or co-located with existing corn ethanol biorefineries. Bolt-on configurations minimize capital expenditures by maximizing the utility of existing plant and unit operation assets—most notably using existing fermentation and distillation assets to convert cellulosic sugars to cellulosic ethanol. Additionally, shared supply chains and distribution channels help lower the investment risk.

Fuel pathways for cellulosic ethanol could include:

- Cellulosic ethanol from forest waste (including from U.S. Forest Service lands in the Sierra foothills, northern California, Oregon, and Washington);

- Cellulosic ethanol from crop residues (including from Central Valley of California and the Midwest); and
- Cellulosic ethanol from conversion of corn/sorghum kernel fiber at conventional corn ethanol facilities.

2) Compliance Responses

Potential compliance responses to the Proposed Amendments could include construction of bolt-on cellulosic processing units at conventional ethanol facilities, as well as construction of stand-alone processing plants that are likely to rely on hydrolysis and gasification procedures to produce ethanol. Collection of source materials for cellulosic ethanol production would be expected to increase, including collection of yard waste, or removal of forest litter. Co-generation systems could also be included in combination with construction of processing facilities.

e) Hydrogen

1) Summary

Hydrogen can be produced from several resources. Currently, most hydrogen is produced from steam reformation of methane. Electricity from the grid or from renewable sources can be used to generate hydrogen via electrolysis. Biomass may also be gasified to produce hydrogen. Biomass can be converted to hydrogen and other byproducts through a number of methods. Because growing biomass removes CO_2 from the atmosphere, the net carbon emissions of these methods can be low. Solar energy can directly or indirectly provide the energy to produce hydrogen. Wind-generated electricity can power water electrolysis to produce hydrogen, which could be used to fuel vehicles, or stored and then used in fuel cells to generate electricity during times of the day when the wind resource is low. Electricity can be used to split water into hydrogen and oxygen. This technology is well-developed and available commercially, and systems that can efficiently use renewable power are being developed.

2) Compliance Responses

Potential compliance responses to the Proposed Amendments could include the construction of new or expanded hydrogen production facilities, using steam methane reformation, electrolysis, or gasification technologies. This could include construction of new infrastructure such as new hydrogen pipelines to transport the hydrogen, or additional truck transport. In addition, additional hydrogen storage on-site at refueling stations or larger-scale storage off-site could be needed.

f) Electricity as Fuel

1) Summary

Most of the electricity consumed in California is generated by natural gas, nuclear energy, and from renewable sources of energy, including hydropower, biomass, wind, geothermal, and solar power.

Battery-electric vehicles (BEV) and plug-in hybrid electric vehicles (PHEV) operating in all-electric mode do not produce tailpipe emissions. Over time production emissions associated with electricity for transportation will decline as California progresses to meeting the 50% renewable electricity requirements in SB 350 and 100% clean energy goal by 2045 in SB 1020, or potentially sooner if EV load is encouraged to be served using renewable sources including solar and wind by policies such as the Proposed Amendments.

Staff expects that the total quantity of electricity used in electric vehicles will increase primarily as a result of the Advanced Clean Cars II, Advanced Clean Trucks, and Advanced Clean Fleets regulations, and therefore the total electricity used as a transportation fuel in the business-as-usual baseline scenario of the LCFS modeling is the same as in the proposed amendments. However, the LCFS sends a strong incentive to reduce the CI of electricity used as a transportation fuel, particularly through the use of solar and wind renewable electricity pathways as compared to the California grid average. In addition, the LCFS directly incentivizes the installation and operation of electric fast charging infrastructure through the Fast Charging Infrastructure (FCI) provision of the regulation. The FCI provision is being expanded in the Proposed Amendments to apply to the trucking sector, and extended for continued use in the light-duty vehicle sector.

2) Compliance Responses

Reasonably foreseeable compliance responses would include the construction and operation of renewable energy production facilities and electric charging infrastructure incentivized by the new and expanded FCI provision in the Proposed Amendments. Expanded renewable energy production could include operation of new facilities, including wind, solar thermal, solar photovoltaic, geothermal, solid-fuel biomass, biogas, solar thermal steam production, hydrogen, pumped storage, battery storage, and hydroelectric systems (i.e., electricity generation associated with dams, run-of-river, or pumped storage facilities). The operation of wind, solar thermal, and solar photovoltaic energy would occur over large but yet-unknown expanses of land and water.

The build out of electric fast charging infrastructure, which is directly incentivized through the LCFS infrastructure credits, could include operation of new or expanding charging facilities, including construction of new charging stations and associated buildings, underground or aboveground electric cables, and substations.

g) Mechanical Carbon Dioxide Removal and Carbon Capture and Sequestration Actions

1) Summary

The Proposed Amendments continue to support the use of carbon capture and sequestration (CCS) in connection with transportation fuel production, and direct air capture (DAC) with carbon sequestration projects. DAC with sequestration is also still eligible for project-based CCS credits but is limited to projects within the United States. DAC with sequestration when attached to a fuel pathway is not limited to the United States.

2) Compliance Responses

Potential compliance responses to the Proposed Amendments could include the construction and operation of new facilities to capture ambient CO_2, modification of existing or construction of new industrial facilities to capture CO_2 emissions (CCS), and construction of new infrastructure, such as pipelines, wells, and other surface facilities to enable the transport and injection of CO_2 into a geologic formation for sequestration. Mechanical carbon dioxide removal and other CCS activities may also result in increased transportation, such as truck, rail, and barge transit to transport CO_2 from the direct air capture facilities and industrial facilities to the sequestration sites. The transport distances and pipeline construction requirements for the captured CO_2 would vary depending on the locations of specific direct air capture facilities and industrial sources of the captured CO_2 and proposed underground formations. On-site energy generation and storage to power the capture equipment are key mitigation strategies involving photovoltaic electricity generation, battery storage, and microgrid systems. Increased electricity demand would be met by increased generation, both on-site and off-site.

2. Potential Changes in Land Use, Shipment Patterns, and Infrastructure

In consideration of the potential for increased use of alternative fuels in California, staff anticipates that there are potential changes in land use, shipment patterns, and infrastructure needs that could occur because of the Proposed Amendments. These changes are summarized below.

a) Land Use Changes

1) Summary

As discussed in this chapter, biofuels rely on feedstock production and are driven by economic demand and supply factors associated with the market for these feedstock products. Feedstocks include byproducts of existing operations (e.g., animal fat, used cooking oil) and crops grown for biofuel or other commodity uses (e.g., corn, soy, and

sugarcane). Both commodity crops and fuel ethanol, renewable diesel, alternative jet fuel, and biodiesel are traded among many countries in the world and are generally anticipated to trend toward increased quantities as demand for low-carbon fuel rises from decarbonization efforts being pursued by national and sub-national governments, as well as from voluntary efforts of individual companies.

Global equilibrium models and research for land use change have shown that crop type, projected crop yields, the assumed elasticity of food demand to price, and the assumed elasticity of crop area to price are all important.[47,48] For instance, a 2011 assessment of past effects of global biofuel demand found a connection between increased soybean cultivation and deforestation in Brazil.[49] Potential greenhouse gas emissions associated with land use change to produce biofuels were quantified through a robust public process to inform the 2015 rulemaking. These emissions estimates are added to the CI of crop-based biofuels before certification.

Additionally, the Proposed Amendments include sustainability criteria for crop-based feedstocks and forest biomass for biofuel production and a ban on palm oil derived fuel crediting, as outlined in the Project Description section above. The Proposed Amendments also end the acceptance of new biomass-based diesel fuel pathway applications after January 1, 2031, contingent on successful implementation of California's MHD ZEV regulations, as outlined in the Project Description section above. In addition, staff is proposing to provide credits for biomass-based diesel produced from virgin soybean oil and canola oil for up to 20 percent of annual biomass-based diesel reported on a company-wide basis. Taken together, these new provisions will reduce the potential risk of deforestation that could occur from the expansion of biofuel production and biofuel feedstock demand and create an even stronger incentive to utilize waste feedstocks.

2) Compliance Responses

Upstream production of agriculture-based feedstocks may result in direct and indirect land use change impacts. Direct land use change, in the context of biofuels, is defined as the displacement of existing cropland or conversion of native habitat to cropland solely to produce a biofuel crop. Indirect land use change occurs when displaced cultivation is relocated onto native habitat or other non-agricultural lands. In terms of determining carbon intensity (CI) values under the Proposed Amendments, both direct

[47] California Air Resources Board, *LCFS Land Use Change Assessment*. (Accessed on September 19, 2023). *https://ww2.arb.ca.gov/resources/documents/lcfs-land-use-change-assessment*
[48] United States Environmental Protection Agency, *Model Comparison Exercise Technical Document*. June 2023. *https://nepis.epa.gov/Exe/ZyPURL.cgi?Dockey=P1017P9B.txt*
[49] Gao, Y., Skutsch, M., Drigo, R., Pacheco, P., & Masera, O. *Assessing deforestation from biofuels:* methodological *challenges*. 2011. Applied Geography, 31(2), 508-518. *https://www.sciencedirect.com/science/article/abs/pii/S0143622810001220*

and indirect land use changes are considered as part of the life cycle GHG emissions analysis.

Land use changes caused by increased demand for fuel feedstocks incentivized by the Proposed Amendments would likely occur across several continents, given the global nature of transportation fuels markets. The Proposed Amendments would incentivize fuels that have lower CI values than crude oil, including fuels made from sugarcane, sorghum, wheat, cellulosic sources, corn, canola, and soy. With continued increased demands on biofuel crops the Proposed Amendments could contribute to increased direct and indirect land use change to accommodate new croplands, but the likelihood of this is at least partially (and potentially fully) accounted for by the LUC scores added to crop-derived pathways.

Waste-based feedstocks, like used cooking oil (UCO) and animal fat, do not have additional LUC scores that are added to their CI value and made up 84% of all biomass-based diesel in the program from 2011 through 2022. The LUC scores for crop-based fuels add 12-70 grams per megajoule (g/MJ) to the pathway's CI score, making the CI of crop-based fuels higher relative to waste-based feedstocks. As the CI benchmark becomes more stringent each year, the program incentive for crop-based feedstocks declines, and pathways using these feedstocks will eventually become deficit-generating.

Demands for crop-based feedstocks are likely to be realized through cultivation of soy and canola feedstocks in Illinois, Iowa, Minnesota, Mississippi, Indiana, Nebraska, Kansas, Ohio, Arkansas, Canada and South America. However, the proposed regulation is not expected to result in significant increases in soy and canola feedstock utilization for biomass-based diesel, given that volumes in excess of 20 percent, which matches 2023 feedstock composition levels across all pathways, will not be eligible for crediting.

As discussed above, as demand for biofuel crops increases, it could displace production of food crops, resulting in conversion of both fallow and cultivated lands to biofuel feedstock crop production. However, ethanol volumes are expected to decrease over the course of the Proposed Amendments, as they are limited by the existing blend limit of 10% and would naturally phase down in tandem with gasoline demand reductions. In addition, the proposed crop-based biofuels sustainability criteria and changes to fuel pathway eligibility would additionally help protect against potential future land use impacts.

b) Changes to Fuel-Associated Shipment Patterns

1) Summary

In general, infrastructure already exists to support increased shipments of feedstock crops and fuels via rail and ocean-going vessels. As shown in Figure 1, demand in California for ethanol could decrease between 2025 and 2045, in tandem with an overall

demand reduction in gasoline. This potential shift could result in a decrease in shipments of ethanol from existing sources (California, other states and Brazil). The proposed amendments would likely also increase demand for biomass-based diesel and alternative jet fuel. Increased levels of transport of diesel substitutes such as biodiesel and renewable diesel would be needed to meet the anticipated demand (see Figure 1).

2) Compliance Responses

Historically, these diesel substitutes have largely been produced outside of California and imported to the State. However, announced production capacity for renewable diesel and alternative jet fuel (AJF) in California has increased substantially in recent years, and it is likely that an increasing proportion of the renewable diesel and AJF demanded in future years of the program would be met by California sources. As a result, existing facilities could be expanded to accommodate general increases in production of these fuels. Additionally, new facilities could be constructed to accommodate the increased production of these fuels. Increasing demand for biodiesel and renewable diesel could result in increased rail, truck, and ocean-going shipment of these fuels into California.

c) Additional Infrastructure Needs

1) Summary

New production plants for renewable diesel, biodiesel, biodiesel additives, AJF, hydrogen, and biomethane could be constructed and operated to meet future demands. Similarly, construction and operation of future innovative technology facilities for drop-in renewable biofuels and Fisher-Tropsch diesel could be developed. Construction and operation of additional hydrogen stations, solar and wind electricity generation projects, and EV charging stations could also be developed to meet future demands and in response to the expanded hydrogen and electric charging infrastructure provisions. New pipelines for renewable natural gas and hydrogen could also be constructed to meet future increased demand for these fuels. Rail and trucking routes could also expand to transport these fuels into and throughout California.

2) Compliance Responses

Potential compliance responses to the Proposed Amendments (both generally and as specifically associated with credits for ZEV infrastructure) also consist of construction and operation of new hydrogen refueling and new DC fast charging infrastructure for both light-duty and MHD ZEVs.

Possible compliance responses from the Proposed Amendments could include installation of additional digesters at existing dairy/swine facilities in California and elsewhere in the United States. Installation of these facilities could result in localized short-term construction impacts.

Possible compliance responses from the Proposed Amendments could include projects at crude oil production facilities or at crude oil refineries. Such projects could include projects that qualify under the innovative crude, refinery investment, renewable hydrogen for refineries, and innovative low-energy/low-complexity refineries provisions of the regulation found in section 95489.

As the carbon intensity benchmark becomes more stringent, additional compliance responses may include the construction and operation of new biofuel production facilities, or conversion of crude oil production facilities and crude oil refineries, which are deficit generating, to biofuel production facilities. Retrofitting existing infrastructure could minimize the need for new greenfield infrastructure development for biofuel production and refining.

d) Carbon Capture and Sequestration at Alternative Fuel Production Facilities, Oil Fields, or Refineries

1) Summary

CCS is a process whereby CO_2 emissions are captured from large industrial sources, such as power plants, natural gas processing facilities, fertilizer plants, ethanol plants, and hydrogen plants, and transported and injected into underground geologic formations, such as depleted oil and gas fields or deep saline aquifers. In California, underground injection projects must be permitted by the U.S. Environmental Protection Agency (U.S. EPA) or the California Department of Conservation Geologic Energy Management Division (CalGEM). U.S. EPA issues Class VI Underground Injection Control permits, which apply to injection wells that are drilled for the sole purpose of CO_2 injection in an underground formation as part of a CCS project, without any other intended purpose. CalGEM issues Class II permits under regulatory authority granted by U.S. EPA pursuant to Underground Injection Control regulations. Class II permits apply to injection wells constructed for the purpose of injecting fluids produced during oil and gas production, such as brines, and include injection wells used in EOR methods that could be used for the purpose of CO_2 sequestration as part of a CCS project.

Staff is proposing updates to the treatment of direct air capture (DAC) with sequestration projects. In the 2018 rulemaking, the LCFS program made DAC with sequestration eligible for project-based CCS credits. Staff is proposing to limit LCFS credit generation eligibility of DAC with sequestration projects to those located in the United States. This geographic limitation would not apply to DAC-to-fuel applications submitted as Tier 2 alternative fuel pathways, as the final fuels from these pathways must be supplied to California to be eligible for LCFS credits.

2) Compliance Responses

Potential compliance responses to the Proposed Amendments could include the development and construction of CCS projects. These projects could include the modification of existing or new industrial facilities to capture CO_2 emissions, along with

construction of new infrastructure such as pipelines, wells, and other surface facilities in various locations to enable the transport and injection of CO_2. The transport distances and pipeline construction requirements for the captured CO_2 would vary considerably, depending on the locations of specific industrial sources. The CCS Protocol, which includes a quantification methodology that accounts for all emitted and sequestered CO_2, ensures that there is a net GHG emissions decrease (i.e., a GHG emissions benefit) for all CCS projects, including CCS projects associated with production of conventional fuels.

F. Summary of Compliance Responses

Reasonably foreseeable compliance responses associated with the Proposed Amendments include the following responses, which could result in changes to the existing physical environment: modifications to cultivation volume and transport of feedstock; changes to location and types of feedstock; new or modified processing facilities for feedstock and finished fuel production; increased transportation of finished alternative fuels to blending terminals or retail fuel sites; construction and operation of new facilities to produce renewable diesel, renewable gasoline, AJF, and renewable propane; construction of biomass gasification and pyrolysis systems for hydrogen and renewable natural gas production; construction of new anaerobic facilities to digest manure from dairies, sewage from wastewater treatment plants, and organic waste diverted from landfills; construction of infrastructure to collect biogas and produce methane; construction of stand-alone and bolt-on cellulosic processing units for renewable fuels production; increase in collection of yard waste or removal of forest litter and agricultural residues; construction of electrolysis units and substitution of renewable natural gas for fossil gas in production of hydrogen; construction of solar and wind electricity generation projects; modification to existing or new industrial facilities to capture CO_2 emissions; construction of new infrastructure such as pipelines, wells and other surface facilities; construction and operation of additional refueling hydrogen stations and EV charging stations; modifications to electricity distribution and transmission infrastructure; modifications to existing crude production facilities to accommodate solar and wind electricity, solar heat, and/or solar steam generation; electrification of equipment and installation of renewable electricity and battery storage systems at petroleum refineries and alternative fuel production facilities; expansion of public transit systems; and land use changes and changes to fuel-associated shipment patterns.

Certain specific amendments included in the Proposed Amendments would not result in compliance responses that change the physical environment or result in adverse environmental effects. These include the addition of third-party verification requirements for additional transaction types, updated modeling tools for pathway application and CI determination, fuel amount reporting improvements, exchange trading, and enhancement to credit transaction reporting. This set of amendments includes modification or updates to already existing programs and processes and would not result in additional physical changes to the environment beyond what would already

occur under the current LCFS regulation. Therefore, these specific proposed amendments would have no impact on any of the environmental resource areas analyzed in this Draft EIA and will not be discussed further.

3.0 Environmental and Regulatory Setting

The State CEQA Guidelines require that an environmental impact report (EIR) 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 it is significant (14 CCR Section 15125). For this ~~Draft~~ Final EIA, CARB is using a 2023 baseline, as that is the year in which the environmental analysis commenced (the Notice of Preparation was posted on February 13, 2023).

As discussed in Chapter 1.0 of this ~~Draft~~ Final EIA, CARB has a CEQA certified regulatory program and prepares an EIA in lieu of an EIR. This ~~Draft~~ Final EIA 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 have been included as Attachment A to this ~~Draft~~ Final EIA.

This page intentionally left blank.

4.0 Impact Analysis and Mitigation Measures

A. Approach to the Environmental Impacts Analysis and Significance Determination

This chapter contains an analysis of environmental impacts and mitigation measures associated with the Proposed Amendments. CEQA states the baseline for determining the significance of environmental impacts would normally be the existing conditions at the time the environmental review is initiated (Title 14 California CCR Section 15125[a]). Therefore, significance determinations reflected in this ~~Draft~~ Final EIA are based on a comparison of the potential environmental consequences of the Proposed Amendments with the regulatory setting and physical conditions in 2023 (see Attachment A). For the purpose of determining whether the Proposed Amendments may have a potential effect on the environment, CARB evaluated the potential physical changes to the environment resulting from the reasonably foreseeable compliance responses described in further detail in Chapter 2.0 of this ~~Draft~~ Final EIA. A table summarizing all the potential impacts and proposed mitigation for each resource area discussed below is included in Attachment B to this document.

The reasonably foreseeable compliance responses associated with the Proposed Amendments are analyzed in a programmatic manner for several reasons: (1) any individual action or activity would be carried out under the same authorizing regulatory authority; (2) the reasonably foreseeable compliance responses would result in generally similar environmental effects that can be mitigated in similar ways (Title 14 CCR Section 15168[a][4]); and (3) while the types of foreseeable compliance responses can be reasonably predicted, the specific location, design, and setting of the potential actions cannot feasibly be known at this time. If a later activity would have environmental effects that are not examined within this ~~Draft~~ Final EIA, the public agency with authority over the later activity may be required to conduct additional environmental review as required by CEQA or other applicable law.

The analysis is based on reasonably foreseeable compliance responses that are based on a set of reasonable assumptions. While the compliance responses described in this ~~Draft~~ Final EIA are not the only conceivable ones, they provide a credible basis for impact conclusions that are consistent with available evidence. Also, as discussed in Chapter 2.0 of this ~~Draft~~ Final EIA, the evaluation of certain compliance responses would be speculative under CEQA. CEQA does not require evaluation of speculative impacts (Title 14 CCR Section 15145). For that reason, an evaluation of effects of these responses is not required and is not included in this analysis. The analysis also includes actions that could likely occur under a broad range of the potential scenarios. The impact discussions reflect a conservative assessment to describe the type and magnitude of effects that may occur (i.e., the conclusions tend to overstate adverse effects) because the specific location, extent, and design of potential new and/or modified facilities cannot be known at this time.

1. Adverse Environmental Impacts

The potentially significant adverse impacts on the environment discussed in this ~~Draft~~ Final EIA, and significance determinations for those effects, reflect the programmatic nature of the reasonably

foreseeable compliance responses of the regulated entities. These reasonably foreseeable compliance responses are described in more detail in Chapter 2.0 ("Project Description") of this ~~Draft~~ Final EIA. This ~~Draft~~ Final EIA addresses broadly defined types of impacts or actions that may be taken by others in the future as a result of implementation of the Proposed Amendments.

This ~~Draft~~ Final EIA takes a conservative approach and considers some environmental impacts as potentially significant because of the inherent uncertainties in the relationship between physical actions that are reasonably foreseeable under the Proposed Amendments and environmentally sensitive resources or conditions that may be affected. This conservative approach tends to overstate environmental impacts in light of these uncertainties and is intended to satisfy the good-faith, full-disclosure intention of CEQA. If and when specific projects are proposed and subjected to project-level environmental review, it is expected that many of the impacts recognized as potentially significant in this ~~Draft~~ Final EIA can actually be avoided or reduced to a less-than-significant level.

Where applicable, consistent with CARB's certified regulatory program requirements (Title 17 CCR Section 60004.2), this ~~Draft~~ Final EIA also acknowledges potential beneficial effects on the environment in each resource area that may result from implementation of the Proposed Amendments. Any beneficial impacts associated with the Proposed Amendments are included in the impact analysis for each resource area listed below.

2. Mitigation Measures

This ~~Draft~~ Final EIA contains a degree of uncertainty regarding implementation of feasible mitigation for potentially significant impacts. "'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" (PRC Section 21061.1). While CARB is responsible for adopting the Proposed Amendments, it does not have authority over all the potential infrastructure and development projects that could be carried out in response to the Proposed Amendments. Other agencies are responsible for the review and approval, including any required environmental analysis, of any facilities and infrastructure that are reasonably foreseeable, including any definition and adoption of feasible project-specific mitigation measures, and any monitoring of mitigation implementation. For example, local cities or counties must review and decide to approve proposals to construct new facilities; CARB does not have jurisdiction over land use permitting of any potential development associated with the compliance responses, such as new manufacturing or recycling facilities. (Cal. Const., Article XI, section 7 ["A county or city may make and enforce within its limits all local, police, sanitary, and other ordinances and regulations not in conflict with general laws."]; *California Building Industry Assn. v. City of San Jose* [2015] 61 Cal.4th 435, 455; *Big Creek Lumber Co. v. County of Santa Cruz* [2006] 38 Cal.4th 1139, 1151-1152; Health and Safety Code Sections 39000–44474 [CARB's statutory authority provides no authority to regulate local land use permitting].) Additionally, state and/or federal permits may be needed for specific environmental resource impacts, such as the taking of endangered species, filling of wetlands, and streambed alteration.

Because CARB cannot predict the location, design, or setting of specific projects that may result and does not have authority over implementation of development that may occur, the programmatic analysis in this ~~Draft~~ Final EIA does not allow for identification of the precise details of project-specific

mitigation. As a result, there is inherent uncertainty in the degree of feasible mitigation that would ultimately need to be implemented to reduce any potentially significant impacts identified in this ~~Draft~~ Final EIA.

Given the foregoing, and due to legal factors affecting the feasibility of CARB's proposed mitigation for several of the identified potential significant indirect impacts associated with the Proposed Amendments, CARB's implementation of the identified mitigation measures is infeasible for two reasons:

- The lack of certainty regarding the scope, siting, and design of compliance-response development projects prevents CARB from being able to determine the projects' significant environmental impacts.
- Even if there were certainty with respect to compliance-response development projects and associated significant environmental impacts, CARB lacks the legal authority and jurisdiction to permit these projects, which inherently prevents CARB from legally imposing any enforceable mitigation measures on the projects.

Therefore, while the mitigation measures identified below in this ~~Draft~~ Final EIA are considered by CARB to be feasible to implement, CARB cannot legally enforce them.

Consequently, this ~~Draft~~ Final EIA takes the conservative approach in its post-mitigation significance conclusions (i.e., tending to overstate the risk that feasible mitigation may not be sufficient to mitigate an impact to less than significant) and discloses, for CEQA compliance purposes, that potentially significant environmental impacts may be unavoidable, where appropriate, due to the lack of jurisdiction by the lead agency to enforce the mitigation measures. It is also possible that the amount of mitigation necessary to reduce environmental impacts to below a significant level may be far less than disclosed in this ~~Draft~~ Final EIA on a case-by-case basis. It is expected that many potentially significant impacts of facility and infrastructure projects would be avoidable or mitigatable to a less-than-significant level as an outcome of their project-specific environmental review processes, conducted by the appropriate permitting agency with jurisdiction as the lead agency under CEQA.

B. Resource Area Impacts and Mitigation Measures

The following discussion provides a programmatic analysis of the reasonably foreseeable compliance responses that could result from implementation of the Proposed Amendments described in Chapter 2.0 of this ~~Draft~~ Final EIA. These impacts are discussed under each environmental resource area in accordance with the topics presented in the Environmental Checklist in Appendix G to the CEQA Guidelines (Title 14 CCR Section 15000 et seq.). These impact discussions are followed by the types of mitigation measures that could be required to reduce significant environmental impacts.

1. Aesthetics

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.

Impact 1-1: Short-Term Construction-Related and Long-Term Operational-Related Impacts on Aesthetics

Reasonably foreseeable compliance responses associated with the Proposed Amendments include the following responses, which could result in changes to the existing physical environment: modifications to cultivation volume and transport of feedstock; changes to location and types of feedstock; new or modified processing facilities for feedstock and finished fuel production; increased transportation of finished alternative fuels to blending terminals or retail fuel sites; construction and operation of new facilities to produce renewable diesel, renewable gasoline, AJF, and renewable propane; construction of biomass gasification and pyrolysis systems for hydrogen and renewable natural gas production; construction of new anaerobic facilities to digest manure from dairies, sewage from wastewater treatment plants, and organic waste diverted from landfills; construction of infrastructure to collect biogas and produce methane; construction of stand-alone and bolt-on cellulosic processing units for renewable fuels production; increase in collection of yard waste or removal of forest litter and agricultural residues; construction of electrolysis units and substitution of renewable natural gas for fossil gas in production of hydrogen; construction of solar and wind electricity generation projects; modification to existing or new industrial facilities to capture CO_2 emissions; construction of new infrastructure such as pipelines, wells and other surface facilities; construction and operation of additional refueling hydrogen stations and EV charging stations; modifications to electricity distribution and transmission infrastructure; modifications to existing crude production facilities to accommodate solar and wind electricity, solar heat, and/or solar steam generation; electrification of equipment and installation of renewable electricity and battery storage systems at petroleum refineries and alternative fuel production facilities; expansion of public transit systems; and land use changes and changes to fuel-associated shipment patterns.

Short-term construction-related activities associated with the reasonably foreseeable compliance responses would involve typical off-road construction equipment (e.g., backhoes, graders, dozers) and on-road heavy-duty vehicles for transport of materials to and from construction sites. Earth moving, paving, or other activities could create temporary mounds or piles of dirt or require staging areas where materials or equipment would be temporarily stored. Depending on the hours when construction is conducted, sources of glare or lighting could be present. Although there is uncertainty regarding the locations of these activities, scenic vistas or views from a State scenic highway could be degraded by the presence of heavy-duty equipment, glare, lighting, or disturbed earth.

In general, infrastructure already exists to support increased shipments of feedstock crops and fuels via rail and ocean-going vessels. New production plants for renewable diesel, biodiesel, biodiesel additives, AJF, hydrogen and biomethane could be constructed and operated to meet future demands. Similarly, construction and operation of future innovative technology facilities for drop-in renewable biofuels and Fisher-Tropsch diesel could be developed. Construction and operation of additional hydrogen stations, solar and wind electricity generation projects, and EV charging stations could also be developed to meet future demands and in response to the expanded hydrogen and electric charging infrastructure provisions. New pipelines for renewable natural gas and hydrogen

could also be constructed to meet future increased demand for these fuels. Rail and trucking routes could also expand to transport these fuels into and throughout California.

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, collection of natural gas from landfills, dairies, and wastewater treatment plants would generally consist of modifications that would result in minimal visual intrusion compared to the existing operations. These modifications could include the construction of digesters to produce methane, pipelines for transport, and ancillary outbuildings. These types of projects would likely be located adjacent to, or within, existing landfills, dairies, and wastewater treatment plants, and would involve structures of similar size, scale, and visual character to those typically found within these types of facilities; thus, visual impacts would not be substantial in these cases.

Construction of new infrastructure, such as pipelines, wells, and other surface facilities within or near new/existing fuel production/storage facilities may be a result of the Proposed Amendments. The transport distances and pipeline construction requirements as a result of associated projects would vary depending on the locations of specific industrial sources of low-carbon fuels. There is uncertainty as to the exact location or character of any new infrastructure or modification of existing infrastructure.

Projects that may cause an increased demand for fuel feedstocks incentivized by the Proposed Amendments would be scattered around several continents, given the global nature of transportation fuels markets. The Proposed Amendments would incentivize fuels that have lower CI values than crude oil, including fuels made from sugarcane, sorghum, wheat, cellulosic sources, corn, canola, and soy. With continued increased demands on biofuel crops the Proposed Amendments could contribute to increased direct and indirect land use change to accommodate new croplands, but the likelihood of this is at least partially (and potentially fully) accounted for by the LUC scores added to crop-derived pathways. With continued increased demands on biofuel crops the Proposed Amendments could displace production of food crops, resulting in conversion of both fallow and cultivated lands to biofuel feedstock crop production. However, ethanol volumes are expected to decrease over the course of the Proposed Amendments, as they are limited by the existing blend limit of 10% and would naturally phase down in tandem with gasoline demand reductions. In addition, the proposed crop-based biofuels sustainability criteria would additionally help protect against potential future land use impacts. As a result, fuel pathways associated with biomass feedstocks would not be expected to substantially alter existing aesthetic resources.

Development of new facilities and infrastructure would be expected to occur in areas zoned in accordance with the land use types associated with this kind of development (e.g., industrial, agricultural); however, such facilities could conceivably introduce or increase the presence of visible artificial elements (e.g., heavy-duty equipment; new or expanded buildings; electric charging; hydrogen fueling stations; solar, geothermal, and wind infrastructure) in areas of scenic importance, such as visibility from State scenic highways. The visual impact of such development would depend on several variables, including the type and size of facilities, distance and angle of view, visual

prominence (including presence of visual obstructions), 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. These types of impacts could result in significant effects on aesthetic resources.

Therefore, short-term construction-related and long-term operational-related effects to aesthetics associated with implementation of the Proposed Amendments would be significant.

Potential scenic, glare, and lighting impacts could be reduced to a less-than-significant level by mitigation measures prescribed by local, state, federal, or other land use or permitting agencies (either in the U.S. or abroad) with approval authority over the development projects.

Mitigation Measure 1-1

The Regulatory Setting in Attachment A includes applicable laws and regulations that relate to visual resources. CARB 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. The following recognized practices are routinely required to avoid and/or minimize impacts on aesthetic resources:

- Proponents of new development and new facilities and structures constructed will submit applications to 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 will implement all feasible mitigation to reduce or substantially lessen the potentially significant scenic or aesthetic impacts of the project.
- To the extent feasible, the sites selected for use as construction staging and laydown areas shall 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 and maintenance areas shall be kept clean and tidy, including the re-vegetation of disturbed soil. Storage of construction materials and equipment shall be screened from view and/or 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 shall be avoided to the greatest extent feasible.
- The project proponent shall 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 EIA 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 significant impacts. Although unlikely after implementation of Mitigation Measure 1-1, it is possible that significant impacts on aesthetics could still occur.

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 EIA takes the conservative approach in its post-mitigation significance conclusion and discloses that short-term construction-related and long-term operational-related scenic and nighttime lighting effects resulting from the Proposed Amendments would remain **significant and unavoidable**.

2. Agriculture and Forestry Resources

Impact 2-1: Short-Term Construction-Related and Long-Term Operation-Related Impacts on Agriculture and Forestry Resources

Reasonably foreseeable compliance responses associated with the Proposed Amendments include the following responses, which could result in changes to the existing physical environment: modifications to cultivation volume and transport of feedstock; changes to location and types of feedstock; new or modified processing facilities for feedstock and finished fuel production; increased transportation of finished alternative fuels to blending terminals or retail fuel sites; construction and operation of new facilities to produce renewable diesel, renewable gasoline, AJF, and renewable propane; construction of biomass gasification and pyrolysis systems for hydrogen and renewable natural gas production; construction of new anaerobic facilities to digest manure from dairies, sewage from wastewater treatment plants, and organic waste diverted from landfills; construction of infrastructure to collect biogas and produce methane; construction of stand-alone and bolt-on cellulosic processing units for renewable fuels production; increase in collection of yard waste or removal of forest litter and agricultural residues; construction of electrolysis units and substitution of renewable natural gas for fossil gas in production of hydrogen; construction of solar and wind electricity generation projects; modification to existing or new industrial facilities to capture CO_2 emissions; construction of new infrastructure such as pipelines, wells and other surface facilities; construction and operation of additional refueling hydrogen stations and EV charging stations; modifications to electricity distribution and transmission infrastructure; modifications to existing crude production facilities to accommodate solar and wind electricity, solar heat, and/or solar steam generation; electrification of equipment and installation of renewable electricity and battery storage

systems at petroleum refineries and alternative fuel production facilities; expansion of public transit systems; and land use changes and changes to fuel-associated shipment patterns.

Reasonably foreseeable compliance responses associated with the Proposed Amendments that could affect agricultural and forest resources are associated with feedstock cultivation, methane collection at dairies, and new digester facilities. Regarding impacts to agricultural resources, it is unknown how much of the land on which digesters would be constructed is currently designated as Prime Farmland, Unique Farmland, or Farmland of Statewide Importance; land zoned for agricultural uses; or land under a Williamson Act contract. However, new digester facilities would be considered an agricultural use as they support livestock operations by providing additional benefits from the livestock manure. Therefore, development of new digester facilities would be consistent with existing agricultural uses or would not result in the conversion of agricultural land to non-agricultural uses, conflict with existing zoning, or conflict with Williamson Act contracts.

Operations to produce additional low-CI fuels or lower the CI of existing fuels could include development of renewable energy projects, such as solar and wind operations. In response to proposals for development of renewable energy projects on important farmland, local governments, and the State have faced the challenge of balancing competing public interests in conserving agricultural land and meeting goals for expanding renewable energy generation. Utility-scale solar and wind energy facilities proposed to be located on Important Farmland and/or property under Land Conservation (Williamson Act) contracts, have resulted in land use conversion. In 2013, a California appellate court upheld an environmental impact report's evaluation of agricultural land impact and mitigation for a proposed solar project on grazing land and Williamson Act contract land where a contract cancellation was proposed (*Save Panoche Valley v. San Benito County, 2013, 217 Cal.App.4th 503)*. The mitigation measures adopted by the lead agency in the case included agricultural conservation easements and measures to restore the site after conclusion of the project's useful life. The Court decision confirmed that it was appropriate for the local lead agency to consider the State's interest in increasing renewable energy generation as a reason to permit the cancellation of a Williamson Act contract. Consequently, conversion of important farmland or forestry resources could occur in response to the recommended actions in the Proposed Amendments. Because CARB has no land use authority, mitigation is not within its purview to reduce significant impacts to less-than-significant levels. While compliance with existing land use policies, ordinances, and regulations would serve to moderate this impact, because of local priorities for protection of agricultural land, the record of recent project approvals in the State demonstrates the impact has not been avoided.

Waste-based feedstocks, like used cooking oil (UCO) and animal fat, do not have additional LUC scores that are added to their CI value and made up 84% of all biomass-based diesel in the program from 2011 through 2022. Waste-based feedstocks are not anticipated to impact agricultural or forestry resources. The Land-Use Change (LUC) scores for crop-based fuels add 12-70 grams per megajoule (g/MJ) to the pathway's CI score, making the CI of crop-based fuels higher relative to waste-based feedstocks. As the CI benchmark becomes more stringent each year, the program incentive for crop-based feedstocks declines, and pathways using these feedstocks will eventually become deficit-generating.

Use of non-waste-based feedstocks (e.g. canola, soy, and others) may increase in response to the Proposed Amendments. To reduce the impact, the Proposed Amendments and current regulation include provisions that either outright ban or significantly disincentivize the use of crop-based biofuels that impact forestry resources or agricultural resources and incentivize the use of waste-based feedstocks. The proposed sustainability criteria for crop-based feedstocks and forest biomass for biofuel production would help protect against potential future land use impacts as it disincentivizes sourcing biofuel feedstocks with higher land-use change risks. Additionally, the proposed amendment to remove palm-derived fuels from eligibility for credit generation continues to disincentivize use of palm-derived fuels, which have been demonstrated to have the highest risk of being sourced from deforested areas.[10]

If facilities are proposed in response to the Proposed Amendments, potential impacts to Prime Farmland, Unique Farmland, or Farmland of Statewide Importance, Williamson Act conservation contracts, or 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, short-term construction-related impacts associated with implementation of the Proposed Amendments on agricultural and forestry resources could be significant.

Potential agricultural and forest resource impacts could be reduced to a less-than-significant level by mitigation measures prescribed by local, state, federal, or other land use or permitting agencies (either in the U.S. or abroad) with approval authority over the particular development projects. However, because CARB has no land use authority, mitigation is not within its purview.

Mitigation Measure 2-1

The Regulatory Setting in Attachment A includes applicable laws and regulations that relate to agriculture and forestry resources. CARB 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. The following recognized practices are routinely required to avoid and/or minimize impacts on agriculture and forestry resources:

- Proponents of new or modified facilities constructed because 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

would certify that the environmental document was prepared in compliance with applicable regulations and would approve the project for development.

- Based on the results of the environmental review, proponents would implement all mitigation identified in the environmental document to reduce or substantially lessen the environmental impacts of the project. Because CARB 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:
  - Avoid lands designated as Important Farmland (state-defined Prime Farmland, Farmland of Statewide Importance, and Unique Farmland) as defined by the Farmland Mapping and Monitoring Program. Before converting Important Farmland to non-agricultural use, analyze the feasibility of using farmland that is not designated as Important Farmland (e.g., through clustering or design change to avoid Farmland) prior to deciding on the conversion of Important Farmland.
  - Avoid lands designated as forest land or timberland before converting forestland or timberland to non-forest use, analyze the feasibility of using other lands prior to deciding on the conversion of forest land or timberland.
  - Any mitigation for permanent conversion of Important Farmland caused by facility construction or modification shall 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:
    - Restore agricultural land to productive use through removal of equipment or structures or other means, such that the land can be designated as Farmland.
    - If restoration is not feasible, permanently preserve off-site Important 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 Important Farmland.
    - Participate in any agricultural land mitigation program, including local government maintained or administered, that provides equal or more effective mitigation than the measures listed.
- Any mitigation for permanent conversion of forest land or timberland caused by facility construction or modification shall 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 forest land or timberland of equal or better quality at a ratio of 1:1 or 1.5:1 because some lost ecological value may not be replaceable. Preservation may include purchase of easements or contribution of funds to a land trust or other agency.

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 EIA 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 significant impacts. Although unlikely after implementation of Mitigation Measure 2-1, it is possible that significant impacts resulting from conversion of Prime Farmland, Unique Farmland, Farmland of Statewide Importance, Williamson Act conservation contracts, and forest land or timberlands could still occur.

Consequently, while impacts could likely be reduced to some degree (although not to a less-than-significant level if Important Farmland were converted) with mitigation measures imposed by the land use and/or permitting agencies acting as lead agencies for these individual projects under CEQA, if and when a project proponent seeks a permit for compliance-response related project, this ~~Draft~~ Final EIA 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 on agriculture and forestry resources associated with the Proposed Amendments would remain **significant and unavoidable**.

Impact 2-2: Agricultural and Forest Resource Impacts Related to Feedstock Cultivation

Reasonably foreseeable compliance responses associated with the Proposed Amendments include the following responses, which could result in changes to the existing physical environment: modifications to cultivation volume and transport of feedstock; changes to location and types of feedstock; new or modified processing facilities for feedstock and finished fuel production; increased transportation of finished alternative fuels to blending terminals or retail fuel sites; construction and operation of new facilities to produce renewable diesel, renewable gasoline, AJF, and renewable propane; construction of biomass gasification and pyrolysis systems for hydrogen and renewable natural gas production; construction of new anaerobic facilities to digest manure from dairies, sewage from wastewater treatment plants, and organic waste diverted from landfills; construction of infrastructure to collect biogas and produce methane; construction of stand-alone and bolt-on cellulosic processing units for renewable fuels production; increase in collection of yard waste or removal of forest litter and agricultural residues; construction of electrolysis units and substitution of renewable natural gas for fossil gas in production of hydrogen; construction of solar and wind electricity generation projects; modification to existing or new industrial facilities to capture CO_2 emissions; construction of new infrastructure such as pipelines, wells and other surface facilities; construction and operation of additional refueling hydrogen stations and EV charging stations; modifications to electricity distribution and transmission infrastructure; modifications to existing crude production facilities to accommodate solar and wind electricity, solar heat, and/or solar steam generation; electrification of equipment and installation of renewable electricity and battery storage systems at petroleum refineries and alternative fuel production facilities; expansion of public transit systems; and land use changes and changes to fuel-associated shipment patterns.

Compliance responses that would use farm wastes, such as rice or sugarcane straw as an ethanol feedstock, would have no effect on current land uses because these actions would be incidental and similar to normal farming practices. Similarly, cellulosic feedstocks are non-food-based feedstocks that include crop residues, wood residues, dedicated energy crops, and industrial and other wastes.

These feedstocks are composed of cellulose, hemicellulose, and lignin. When cultivated for low-carbon biofuel production, cellulosic feedstocks are expected to be grown on marginal lands not suitable for other crops, thereby maintaining agricultural lands that could otherwise be converted to other uses.

Because the LCFS program is market-driven, it is not possible to determine the exact locations where these feedstocks may be cultivated. The amount of land required to produce enough biofuel to meet projected demand depends entirely on the productivity of a given feedstock on a given parcel of land. Feedstocks may be sourced from forest and agricultural lands and would be dependent on available quantities and location of processing facilities. Productivity is, in turn, governed by a wide variety of physiological factors, including genetic diversity, agronomic practice, and environmental factors, such as soil quality, water availability, and climate. Thus, predicting the amount of land required to produce enough low-carbon biofuel to impact existing agricultural practices is speculative. In addition, the use of residual biomass from agricultural, forestry, and municipal activities decreases the amount of land needed for energy crops. Likewise, the development of crops used for fuel production adapted to be highly productive on lands marginal for other agricultural uses could reduce the potential impact of biofuel production on non-fuel crop production. Decisions regarding land use and feedstock choices would have an impact on how much biofuel could be produced in a given area. However, because the Proposed Amendments would provide incentives that could lead to an increase in the production of certain agricultural feedstocks to produce low-carbon biofuels, and because such an increase could contribute to potential land use changes that could adversely affect agricultural and forest resources, this impact would be significant.

Therefore, long-term operational-related effects to agriculture and forestry resources associated with implementation of the Proposed Amendments would be significant.

Potential agricultural and forest resource impacts could be reduced to a less than significant level by mitigation measures prescribed by local, state, federal, or other land use or permitting agencies (either in the U.S. or abroad) with approval authority over the particular development projects. However, because CARB has no land use authority, mitigation is not within its purview to reduce significant impacts to less-than-significant levels.

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

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 EIA 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 significant agricultural or forest land 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 EIA takes the conservative approach in its post-mitigation significance conclusion and discloses, for CEQA compliance purposes, that agricultural and forest resource impacts resulting from increased fuel-based agricultural feedstock production associated with the Proposed Amendments would be **significant and unavoidable**.

3. Air Quality

Impact 3-1: Short-Term Construction-Related Impacts on Air Quality

Reasonably foreseeable compliance responses associated with the Proposed Amendments include the following responses, which could result in changes to the existing physical environment: modifications to cultivation volume and transport of feedstock; changes to location and types of feedstock; new or modified processing facilities for feedstock and finished fuel production; increased transportation of finished alternative fuels to blending terminals or retail fuel sites; construction and operation of new facilities to produce renewable diesel, renewable gasoline, AJF, and renewable propane; construction of biomass gasification and pyrolysis systems for hydrogen and renewable natural gas production; construction of new anaerobic facilities to digest manure from dairies, sewage from wastewater treatment plants, and organic waste diverted from landfills; construction of infrastructure to collect biogas and produce methane; construction of stand-alone and bolt-on cellulosic processing units for renewable fuels production; increase in collection of yard waste or removal of forest litter and agricultural residues; construction of electrolysis units and substitution of renewable natural gas for fossil gas in production of hydrogen; construction of solar and wind electricity generation projects; modification to existing or new industrial facilities to capture CO_2 emissions; construction of new infrastructure such as pipelines, wells and other surface facilities; construction and operation of additional refueling hydrogen stations and EV charging stations; modifications to electricity distribution and transmission infrastructure; modifications to existing crude production facilities to accommodate solar and wind electricity, solar heat, and/or solar steam generation; electrification of equipment and installation of renewable electricity and battery storage systems at petroleum refineries and alternative fuel production facilities; expansion of public transit systems; and land use changes and changes to fuel-associated shipment patterns.

Implementation of the Proposed Amendments could include construction of new refueling infrastructure or modifications to existing facilities. Any proposed modifications to facilities resulting from any of the Proposed Amendments would require approvals from the applicable local or state land use authority 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 district rules and regulations). The environmental review process would include an assessment of whether 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 are not known and would be dependent upon a variety of factors that are not within the control or authority of CARB and not within its purview. Thus, CARB has not quantified the potential construction-related emission impacts as these would be too speculative to provide a meaningful evaluation. 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.

Generally, it is expected that during the construction phase for any facilities, criteria air pollutants and toxic air contaminants (TAC) 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 particulate matter (PM) dust emissions, which is the primary pollutant of concern during construction. Fugitive PM dust emissions (e.g., respirable particulate matter [PM10] and fine particulate matter [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. It is probable that transport of light equipment and personnel for construction activities would take place using light-duty trucks, while transport of heavy equipment or bulk materials would be hauled in heavy-duty trucks. Exhaust emissions from construction-related mobile sources also include reactive organic gases and oxides of nitrogen (NOx). These emission types and associated levels fluctuate greatly depending on the type, number, and duration of usage for the varying equipment. CARB implements several regulations with the purpose of reducing NOx and PM, and imposing limits on idling from in-use vehicles and equipment, including the Truck and Bus Regulation, the Regulation for In-Use Off-Road Diesel Fueled Fleets, and the Portable Engine Airborne Toxic Control Measure. Much of the equipment used during the construction phase would be subject to these regulations.

The site preparation phase of construction 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 NO_X 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, or amended, 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 Proposed Amendments would be significant.

Potential air quality impacts could be reduced to a less than significant level by mitigation measures prescribed by local, state, federal, or other land use or permitting agencies (either in the U.S. or abroad) with approval authority over the particular development projects. However, because CARB lacks land use authority, mitigation is not within its purview to reduce significant impacts to less-than-significant levels.

Mitigation Measure 3-1

The Regulatory Setting in Attachment A includes applicable laws and regulations that relate to air quality. CARB 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 typically 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. The following recognized practices are routinely required to avoid and/or minimize impacts on air quality:

- 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 local air district thresholds and environmental regulations as part of approval of a project for development.
- Based on the results of the environmental review, proponents shall implement all feasible mitigation to reduce or substantially lessen the potentially significant air quality impacts of the project.
- Project proponents shall apply for, secure, and comply with all appropriate air quality permits and applicable local air district thresholds for project construction from the local agencies with air quality jurisdiction and from other applicable agencies, if appropriate, prior to construction mobilization.
- Project proponents shall comply with the federal Clean Air Act (CAA) and the California Clean Air Act (e.g., New Source Review and Best Available Control Technology criteria), if applicable.
- Project proponents shall comply with local plans, policies, ordinances, rules, local air district thresholds, and regulations regarding air quality-related emissions and associated exposure (e.g., construction-related fugitive PM dust regulations, indirect source review, and payment into off-site mitigation funds).
- For projects located in PM nonattainment areas, project proponents shall 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 EIA does not attempt to address project-specific details of mitigation that is beyond CARB's authority, there is inherent uncertainty in the degree of mitigation that may ultimately be implemented to reduce significant impacts. Although unlikely after implementation of Mitigation Measure 1-1, it is possible that significant impacts on air quality resources could still occur.

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

Impact 3-2: Long-Term Operational-Related Impacts on Air Quality

Reasonably foreseeable compliance responses associated with the Proposed Amendments include the following responses, which could result in changes to the existing physical environment: modifications to cultivation volume and transport of feedstock; changes to location and types of feedstock; new or modified processing facilities for feedstock and finished fuel production; increased transportation of finished alternative fuels to blending terminals or retail fuel sites; construction and operation of new facilities to produce renewable diesel, renewable gasoline, AJF, and renewable propane; construction of biomass gasification and pyrolysis systems for hydrogen and renewable natural gas production; construction of new anaerobic facilities to digest manure from dairies, sewage from wastewater treatment plants, and organic waste diverted from landfills; construction of infrastructure to collect biogas and produce methane; operation of biogas to biomethane upgrading equipment; construction of stand-alone and bolt-on cellulosic processing units for renewable fuels production; increase in collection of yard waste or removal of forest litter and agricultural residues; construction of electrolysis units and substitution of renewable natural gas for fossil gas in production of hydrogen; construction of solar and wind electricity generation projects; modification to existing or new industrial facilities to capture CO_2 emissions; construction of new infrastructure such as pipelines, wells and other surface facilities; construction and operation of additional refueling hydrogen stations and EV charging stations; modifications to electricity distribution and transmission infrastructure; modifications to existing crude production facilities to accommodate solar and wind electricity, solar heat, and/or solar steam generation; electrification of equipment and installation of renewable electricity and battery storage systems at petroleum refineries and alternative fuel production facilities; expansion of public transit systems; and land use changes and changes to fuel-associated shipment patterns.

The potential substitution from fossil fuels to low-CI electricity, hydrogen, natural gas, and liquid biofuels associated with the Proposed Amendments may result in reductions in criteria pollutants and air toxics. Life cycle analyses of these alternative fuels (from production through their use as transportation fuel) shows that they have a lower carbon intensity and thus emit fewer GHGs on a lifecycle basis than fossil fuels like gasoline, diesel, and fossil jet fuel. The air quality analysis conducted for the Proposed Amendments shows that deployment of alternative fuels will also reduce criteria pollutants and toxics relative to continued use of fossil fuels like gasoline, diesel and fossil jet

fuel.[50,51] The program incentivizes these low and zero-CI fuels through the declining annual CI benchmark while also incentivizing direct emission reductions through facility operational changes and carbon capture and sequestration projects.

Biomass-based diesel use attributed to the LCFS as part of the Proposed Amendments could result in an overall potential decrease in long-term operational NOx and PM emissions relative to use of conventional diesel in all state-designated and federally designated ozone non-attainment areas from 2024 through 2046. There is also a projected increase in both long-term operational NOx and PM2.5 emissions due to biomass and biofuel transportation and distribution as a result of the Proposed Amendments, but these emission increases are much less than the emission benefits provided by the use of biomass-based diesel that would be incentivized by the Proposed Amendments. Additionally, it is expected that the Proposed Amendments could result in an increase in production and/or expansion at California alternative fuel facilities and modification of alternative fuel facilities to accommodate carbon capture and storage projects. Finally, the Proposed Amendments are expected to result in an increase in the use of alternative jet fuel (AJF) at California airports. There are projected reductions in long-term operational criteria pollutant emissions from the use of AJF due to reduced criteria pollutant emissions during taxi, takeoffs, and landings, which may result in decreased detrimental health impacts, especially near airports. Overall, the Proposed Amendments are expected to result in lower total long-term operational NOx and PM2.5 emissions in each year from 2024 through 2046.

Air quality changes from the Proposed Amendments differ geographically based on fuel production and consumption patterns. The Proposed Amendments are expected to reduce criteria pollutants and toxics more significantly in regions with heavy use of motor vehicles and diesel engines, such as big population centers (e.g., South Coast) and areas with heavy truck use (e.g., San Joaquin Valley). Statewide, implementation of the Proposed Amendments could reduce health impacts in all the categories evaluated by CARB for the Health Impact Analysis.[52] These reductions in adverse health cases would be seen across all ages in the State and could particularly benefit children due to reduced cases of asthma onset and symptoms.

Reducing criteria pollutants and toxic emissions from fuel combustion in line with California's air quality goals requires deploying ZEVs and ensuring the availability of fueling infrastructure to support ZEV deployment. CARB staff estimated air quality benefits attributable to the Proposed Amendments. In projecting the emissions benefits of the Proposed Amendments, CARB staff referenced the information contained in Appendix C-1, pages B-1 through B-12, including Tables 47-59 and the

[50] Fossil fuels contain benzene, toluene, ethyl benzene, and xylenes (BTEX compounds), which can be emitted into the air and contaminate soil and water. Gasoline engine exhaust contains benzene, 1,3-butadiene, formaldehyde, and acetaldehyde. Diesel engine exhaust contains diesel particulate matter, which is a toxic air contaminant (TAC). Generally, all exhaust from the combustion of hydrocarbon fuels contains benzene as a product of incomplete combustion.
[51] Criteria pollutants are estimated using a variety of tools including CARB's California Emissions Projection Analysis Model (CEPAM) 2019 Ozone SIP v.1.04, the on-road vehicle emission inventory tool EMFAC2021 v.1.02, CA-GREET 3.0, and CEIDARS 2020 Static.
[52] California Air Resources Board, *Low Carbon Fuel Standard 2023 Amendments Standardized Regulatory Impact Assessment (SRIA): Chapter 2*. September 8, 2023. *https://ww2.arb.ca.gov/sites/default/files/2023-09/lcfs_sria_2023_0.pdf*

accompanying narrative.[53] The emissions analysis includes expected reductions in emissions from upstream oil and gas extraction that would be expected to result from corresponding petroleum fuel demand reductions. These emission reductions also include estimated changes in emissions that occur from changes in renewable fuel use in vehicles, feedstock transport, and changes in renewable fuel production. Additionally, the emissions benefits modeled for the Proposed Amendments were calculated using a baseline that includes technology changes expected from implementation of the on-road light duty (Advanced Clean Cars II) and on-road heavy duty (Advanced Clean Trucks and Advanced Clean Fleets) regulations and is therefore a conservative analysis that does not reflect the benefits of transitioning to ZEV. However, while not quantified, the Proposed Amendments are expected to play a key role in supporting implementation of these vehicle-focused regulations, by reducing the cost of electricity and hydrogen used as vehicle fuels, supporting installation and operation of charging and hydrogen refueling stations, and promoting investment in transportation electrification in disadvantaged, low-income and rural communities. Therefore, the LCFS program remains a key tool in supporting the transition to ZEV technology and the concurrent air quality and GHG benefits.

The Proposed Amendments achieve reductions of PM2.5 and NOx through 2046.[54] These emissions reductions are driven in part by increased use of renewable diesel and alternative jet fuel, which displace fossil diesel and fossil jet fuel. Relative to the air quality calculations underlying the Staff Report, staff has updated the emission factor for NOx and PM benefits from alternative jet fuel. The updated emission factor attributes no NOx benefits to alternative jet fuel, but more PM benefits (changed from 45% to 65% reduction compared to fossil jet fuel).[55] In addition to LCFS support of alternative jet fuel deployment, CARB is also working with local, Federal, and international agencies to pursue criteria and GHG emission reductions from airports and aircraft.[56] As noted earlier, emissions reductions from phasing down oil extraction and refining operations in tandem with petroleum demand reductions are also included in this analysis. In total, the Proposed Amendments achieve reductions of 9,232 tons of PM2.5 and 35,161 tons of NOx in aggregate through 2046.

[53] Staff identified a small technical error in the energy density of biodiesel and renewable diesel used for the analysis shown in Appendix C-1, and corrected the error for the updated ISOR emissions analysis.
[54] California Air Resources Board, *California's Air Quality Analysis Workbook from 15-Day Package*, July 19, 2024. https://ww2.arb.ca.gov/resources/documents/supplemental-20232024-lcfs-modeling-documentation
[55] Hamilton et al, "Alternative Jet Fuels Emissions: Quantification Methods Creation and Validation Report," Transportation Research Board, Airport Cooperative Research Program, August 2019.
[56] California Air Resources Board, *California's Actions in Reducing Emissions from Airports and Aircraft*, July 19, 2024. https://ww2.arb.ca.gov/sites/default/files/2024-08/California%20Aircraft%20and%20Airports%20Fact%20Sheet%20-%20July%202024_0.pdf

Table 3: Criteria Pollutant Emissions per Day Compared To Business As Usual Scenario

Year	NOx (tpd)	PM2.5 (tpd)
2024	-1.8	-0.3
2025	-4.8	-0.7
2026	-5.5	-0.9
2027	-5.2	-1.0
2028	-4.8	-1.0
2029	-4.8	-1.0
2030	-5.1	-1.1
2031	-5.0	-1.1
2032	-4.8	-1.1
2033	-4.6	-1.1
2034	-4.4	-1.1
2035	-4.3	-1.1
2036	-4.2	-1.1
2037	-4.0	-1.1
2038	-3.8	-1.1
2039	-3.8	-1.2
2040	-3.8	-1.2
2041	-3.8	-1.2
2042	-3.6	-1.2
2043	-3.6	-1.3
2044	-3.5	-1.3
2045	-3.5	-1.4
2046	-3.5	-1.4
Total	-96.3	-25.3

Table 4: Annual PM2.5 Emissions by Air Basin (tpd)[57,58]

Air Basin	Great Basin Valleys	Lake County	Lake Tahoe	Mojave Desert	Mountain Counties	North Central Coast	North Coast	Northeast Plateau	Sacrame-nto Valley	Salton Sea	San Diego	San Francisco Bay Area	San Joaquin Valley	South Central Coast	South Coast
Year	tons/day	tons/ day	tons/ day	tons/ day	tons/day	tons/day	tons/ day	tons/day	tons/day	tons/day	tons/day	tons/day	tons/day	tons/day	tons/ day
2022	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2023	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2024	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-0.1	0.0	-0.1
2025	0.0	0.0	0.0	-0.1	0.0	0.0	0.0	0.0	-0.1	0.0	0.0	-0.1	-0.1	0.0	-0.2
2026	0.0	0.0	0.0	-0.1	0.0	0.0	0.0	0.0	-0.1	0.0	-0.1	-0.1	-0.1	0.0	-0.2
2027	0.0	0.0	0.0	-0.1	0.0	0.0	0.0	0.0	-0.1	-0.1	-0.1	-0.1	-0.3	0.0	-0.2
2028	0.0	0.0	0.0	-0.1	0.0	0.0	0.0	0.0	-0.1	-0.1	-0.1	-0.1	-0.2	0.0	-0.2
2029	0.0	0.0	0.0	-0.1	0.0	0.0	0.0	0.0	-0.1	-0.1	-0.1	-0.1	-0.3	0.0	-0.2
2030	0.0	0.0	0.0	-0.1	0.0	0.0	0.0	0.0	-0.1	-0.1	-0.1	-0.1	-0.3	0.0	-0.2
2031	0.0	0.0	0.0	-0.1	0.0	0.0	0.0	0.0	-0.1	-0.1	-0.1	-0.1	-0.4	0.0	-0.2
2032	0.0	0.0	0.0	-0.2	0.0	0.0	0.0	0.0	-0.1	-0.1	-0.1	-0.1	-0.4	0.0	-0.2
2033	0.0	0.0	0.0	-0.2	0.0	0.0	0.0	0.0	-0.1	-0.1	-0.1	-0.1	-0.4	0.0	-0.2
2034	0.0	0.0	0.0	-0.2	0.0	0.0	0.0	0.0	-0.1	-0.1	-0.1	-0.1	-0.4	0.0	-0.2
2035	0.0	0.0	0.0	-0.2	0.0	0.0	0.0	0.0	-0.1	-0.1	-0.1	-0.1	-0.4	0.0	-0.2
2036	0.0	0.0	0.0	-0.2	0.0	0.0	0.0	0.0	-0.1	-0.1	-0.1	-0.1	-0.4	0.0	-0.2
2037	0.0	0.0	0.0	-0.2	0.0	0.0	0.0	0.0	-0.1	-0.1	-0.1	-0.1	-0.4	0.0	-0.2
2038	0.0	0.0	0.0	-0.2	0.0	0.0	0.0	0.0	0.0	-0.1	-0.1	-0.1	-0.4	0.0	-0.2
2039	0.0	0.0	0.0	-0.2	0.0	0.0	0.0	0.0	0.0	-0.1	-0.1	-0.1	-0.4	0.0	-0.2
2040	0.0	0.0	0.0	-0.2	0.0	-0.1	0.0	0.0	0.0	-0.1	-0.1	-0.1	-0.4	-0.1	-0.2

[57] Numbers rounded to tenth place.
[58] California Air Resources Board, *California's Air Quality Analysis Workbook from 15-Day Package*, July 19, 2024. https://ww2.arb.ca.gov/resources/documents/supplemental-20232024-lcfs-modeling-documentation

Air Basin	Great Basin Valleys	Lake County	Lake Tahoe	Mojave Desert	Mountain Counties	North Central Coast	North Coast	Northeast Plateau	Sacrame-nto Valley	Salton Sea	San Diego	San Francisco Bay Area	San Joaquin Valley	South Central Coast	South Coast
2041	0.0	0.0	0.0	-0.2	0.0	-0.1	0.0	0.0	0.0	-0.1	-0.1	-0.1	-0.4	-0.1	-0.2
2042	0.0	0.0	0.0	-0.2	0.0	-0.1	0.0	0.0	0.0	-0.1	-0.1	-0.1	-0.4	-0.1	-0.2
2043	0.0	0.0	0.0	-0.2	0.0	-0.1	0.0	0.0	0.0	-0.1	-0.1	-0.1	-0.4	-0.1	-0.2
2044	0.0	0.0	0.0	-0.2	0.0	-0.1	0.0	0.0	0.0	-0.1	-0.1	-0.1	-0.5	-0.1	-0.2
2045	0.0	0.0	0.0	-0.2	0.0	-0.1	0.0	0.0	0.0	-0.1	-0.1	-0.1	-0.5	-0.1	-0.2
2046	0.0	0.0	0.0	-0.2	0.0	-0.1	0.0	0.0	0.0	-0.1	-0.1	-0.1	-0.5	-0.1	-0.2

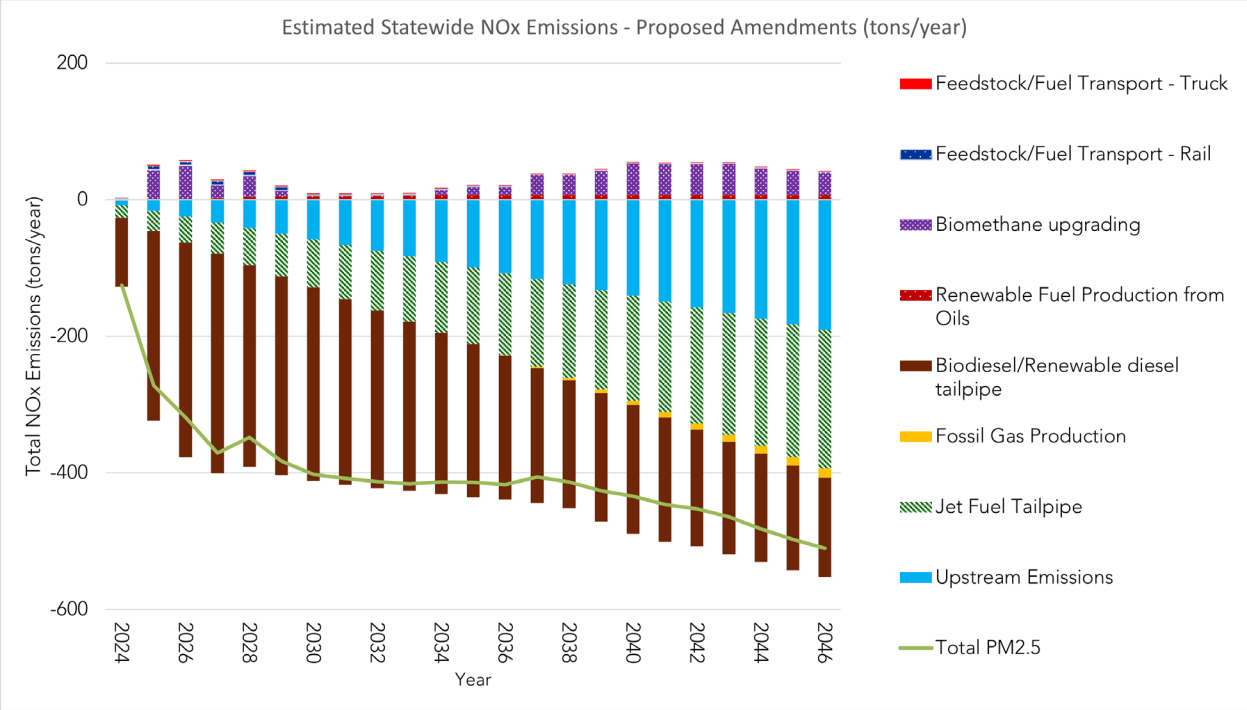
Table 5: Annual NOx Emissions by Air Basin (tpd)[59,60]

Air Basin	Great Basin Valleys	Lake County	Lake Tahoe	Mojave Desert	Mountain Counties	North Central Coast	North Coast	Northeast Plateau	Sacrame-nto Valley	Salton Sea	San Diego	San Francisco Bay Area	San Joaquin Valley	South Central Coast	South Coast
Year	tons/day	tons/ day	tons/ day	tons/day	tons/day	tons/day	tons/ day	tons/day	tons/day	tons/ day	tons/ day	tons/day	tons/day	tons/day	tons/ day
2022	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2023	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2024	0.0	0.0	0.0	-0.1	0.0	0.0	0.0	0.0	-0.2	-0.1	-0.1	-0.2	-0.5	-0.1	-0.5
2025	0.0	0.0	0.0	-0.3	0.0	-0.1	-0.1	-0.1	-0.4	-0.2	-0.3	-0.6	-1.2	-0.2	-1.4
2026	0.0	0.0	0.0	-0.4	0.0	-0.1	-0.1	-0.1	-0.5	-0.2	-0.3	-0.7	-1.3	-0.2	-1.6
2027	0.0	0.0	0.0	-0.4	0.0	-0.1	-0.1	-0.1	-0.4	-0.2	-0.3	-0.6	-1.3	-0.2	-1.5
2028	0.0	0.0	0.0	-0.4	0.0	-0.1	-0.1	-0.1	-0.4	-0.2	-0.3	-0.6	-1.2	-0.2	-1.3
2029	0.0	0.0	0.0	-0.4	0.0	-0.1	-0.1	-0.1	-0.4	-0.2	-0.2	-0.5	-1.3	-0.2	-1.3
2030	0.0	0.0	0.0	-0.5	0.0	-0.1	-0.1	-0.1	-0.4	-0.2	-0.2	-0.5	-1.4	-0.2	-1.3
2031	0.0	0.0	0.0	-0.5	0.0	-0.1	-0.1	-0.1	-0.4	-0.2	-0.2	-0.5	-1.4	-0.2	-1.3
2032	0.0	0.0	0.0	-0.5	0.0	-0.1	-0.1	0.0	-0.4	-0.2	-0.2	-0.5	-1.4	-0.2	-1.2

[59] Numbers rounded to tenth place.
[60] California Air Resources Board, *California's Air Quality Analysis Workbook from 15-Day Package*, July 19, 2024. https://ww2.arb.ca.gov/resources/documents/supplemental-20232024-lcfs-modeling-documentation

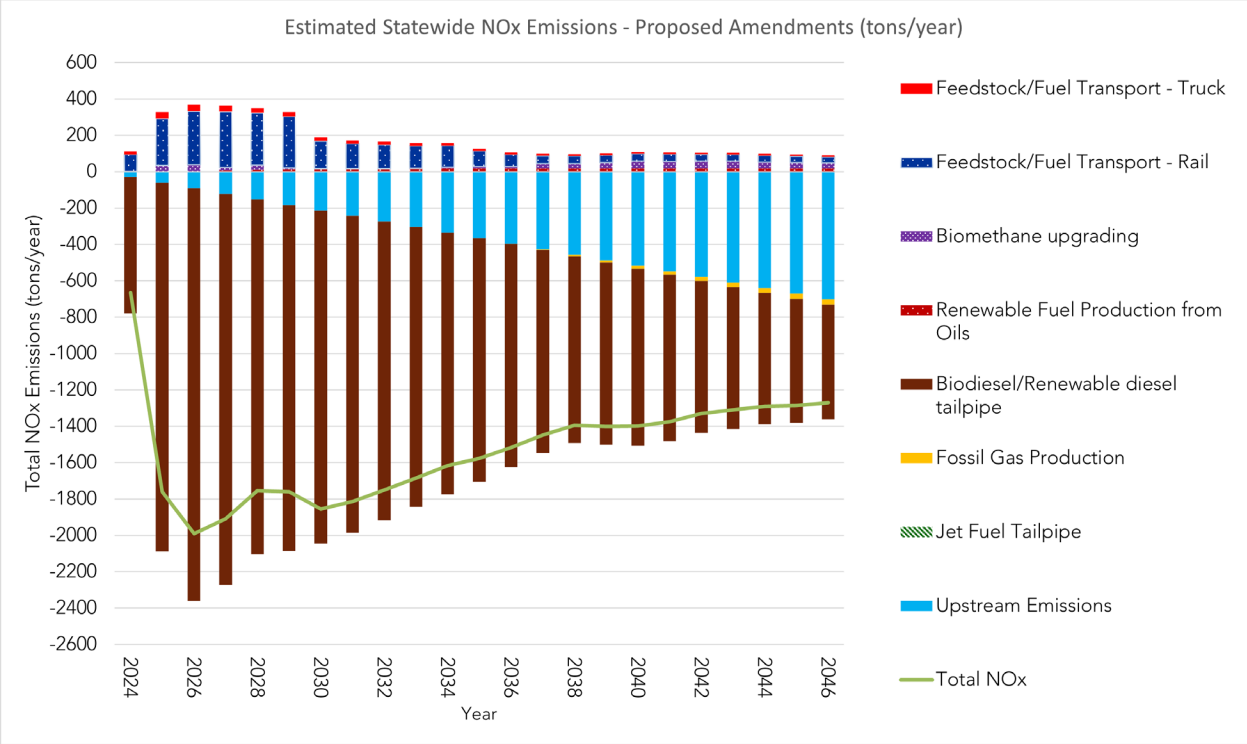
Air Basin	Great Basin Valleys	Lake County	Lake Tahoe	Mojave Desert	Mountain Counties	North Central Coast	North Coast	Northeast Plateau	Sacrame-nto Valley	Salton Sea	San Diego	San Francisco Bay Area	San Joaquin Valley	South Central Coast	South Coast
2033	0.0	0.0	0.0	-0.5	0.0	-0.1	-0.1	0.0	-0.4	-0.2	-0.2	-0.4	-1.4	-0.2	-1.1
2034	0.0	0.0	0.0	-0.5	0.0	-0.1	-0.1	0.0	-0.3	-0.2	-0.2	-0.4	-1.3	-0.2	-1.1
2035	0.0	0.0	0.0	-0.5	0.0	-0.1	-0.1	0.0	-0.3	-0.2	-0.2	-0.4	-1.3	-0.2	-1.0
2036	0.0	0.0	0.0	-0.5	0.0	-0.1	0.0	0.0	-0.3	-0.2	-0.2	-0.3	-1.3	-0.2	-0.9
2037	0.0	0.0	0.0	-0.5	0.0	-0.1	0.0	0.0	-0.3	-0.1	-0.1	-0.3	-1.3	-0.2	-0.9
2038	0.0	0.0	0.0	-0.5	0.0	-0.1	0.0	0.0	-0.3	-0.1	-0.1	-0.3	-1.3	-0.2	-0.8
2039	0.0	0.0	0.0	-0.5	0.0	-0.1	0.0	0.0	-0.3	-0.1	-0.1	-0.3	-1.3	-0.2	-0.8
2040	0.0	0.0	0.0	-0.5	0.0	-0.1	0.0	0.0	-0.3	-0.1	-0.1	-0.3	-1.3	-0.2	-0.8
2041	0.0	0.0	0.0	-0.5	0.0	-0.1	0.0	0.0	-0.2	-0.1	-0.1	-0.2	-1.3	-0.2	-0.7
2042	0.0	0.0	0.0	-0.5	0.0	-0.1	0.0	0.0	-0.2	-0.1	-0.1	-0.2	-1.3	-0.3	-0.7
2043	0.0	0.0	0.0	-0.5	0.0	-0.1	0.0	0.0	-0.2	-0.1	-0.1	-0.2	-1.3	-0.3	-0.7
2044	0.0	0.0	0.0	-0.5	0.0	-0.1	0.0	0.0	-0.2	-0.1	-0.1	-0.2	-1.3	-0.3	-0.6
2045	0.0	0.0	0.0	-0.5	0.0	-0.1	0.0	0.0	-0.2	-0.1	-0.1	-0.2	-1.4	-0.3	-0.6
2046	0.0	0.0	0.0	-0.5	0.0	-0.1	0.0	0.0	-0.2	-0.1	-0.1	-0.2	-1.4	-0.3	-0.6

Figure 5: Estimated Statewide PM2.5 Emissions Impact of the Proposed Amendments (tons/year)[61]



[61] California Air Resources Board. *"15-day Proposed Air Quality Emissions Calculation"*. August 12, 2024. Excel Spreadsheet. https://ww2.arb.ca.gov/sites/default/files/2024-08/2024%20LCFS_Amendments_Air_Quality_Calculations_15Day%20Proposed_1.xlsx

Figure 6: Estimated Statewide NOx Emissions Impact of the Proposed Amendments (tons/year)[62]



As discussed previously, the Proposed Amendments would result in shifting fuel production activities and the establishment of new fuel production. This production or combustion of individual alternative fuels in specific applications may result in criteria

[62] Ibid.

pollutant and other emissions.[63,64,65] These potential local increases in emissions would be largely dependent on the extent and location of increased biofuel production. See Appendix C-1 of the ISOR for more information on individual fuel production, transport, and use emission factors. While CARB anticipates some potential increases in local emissions associated with increased biofuel production and transport and biomethane production, on an air basin level, CARB does not believe significant localized increases are likely since these increases would likely be equivalent to or less than emission reductions associated with biodiesel, renewable diesel, and alternative jet fuel use. Overall, while CARB anticipates beneficial long-term air quality regional and statewide impacts associated with the Proposed Amendments, an increase in emissions of criteria pollutants associated with feedstock transport to production facilities, production of biofuels, and transport of finished fuels to blending facilities is possible. Any new biofuel production facilities would be required to follow all State and local emission-related requirements and standards to protect public health and the environment. Moreover, on a statewide and regional basis, potential emission increases near production facilities are estimated to be very small relative to total emission reductions from the use of biodiesel and renewable diesel, alternative jet fuel, refinery efficiency projects, and solar steam in those same areas. CARB also expects that implementation of recent vehicles regulations (e.g., Advanced Clean Fleets, Advanced Clean Trucks, and Advanced Clean Cars II) will result in significant localized and statewide emission reductions as combustion emissions decline. However, in response to the LCFS amendments, small emissions increases may occur near feedstock and finished fuel transportation routes and near production facilities. Emissions from these stationary sources would be monitored and controlled by local air districts to minimize the negative impacts from the increased production. Under State Implementation Plans (SIPs), states are required to provide comprehensive plans to attain the NAAQS set by the U.S. EPA. CARB reviews and approves local area districts and other agencies' SIP elements and ensures they achieve the State's criteria pollution targets. Additionally, AB 617 directs CARB to

---

[55] For example, in the Environmental Analysis for the 2018 LCFS Rulemaking, CARB staff identified that biodiesel combustion use may contribute to increased NOx emissions relative to conventional diesel in specific vehicle applications. CARB implements the Regulation on Commercialization of Alternative Diesel Fuels (title 13, CCR, §§ 2293 et seq.) to ensure NOx emissions equivalence from biodiesel use. CARB staff used the same conservative approach included in the 2018 rulemaking to estimate NOx biodiesel emissions as part of this rulemaking and have continued to study the potential emissions impacts of biodiesel and other fuels in California and refine approaches to controlling such potential impacts based on available evidence.

[56] California Air Resources Board, *Low Emission Diesel (LED) Study: Biodiesel and Renewable Diesel* Emissions *in Legacy and New Technology Diesel Engines*, November 2021. https://ww2.arb.ca.gov/sites/default/files/2021-12/Low_Emission_Diesel_Study_Final_Report_12-29-21.pdf

[57] Another example is that the upgrading of biogas and use of biomethane may result in emissions, depending on the biogas source, collection process, upgrading process, and end-use. CARB staff estimated criteria pollutant emissions from biogas and biomethane utilization as part of this rulemaking and continues to study the potential emissions impacts of biogas and biomethane and refine approaches to controlling such potential impacts based on available evidence.

cooperate with local air districts to implement criteria pollutant reduction programs in high-exposure communities. AB 617 additionally requires CARB to establish and maintain a database of the best-available retrofit control technology for criteria pollutants. The programs, standards, and plans specified under the SIPs and AB 617 will most likely ensure that any increase in criteria pollutant emissions from increased activity due to the Proposed Amendments will be controlled to minimize the impacts on California residents, especially in areas with poor air quality.

Notwithstanding the efforts of CARB and local air districts discussed above to monitor and reduce criteria pollutant emissions, and despite estimated beneficial long-term operational impacts statewide, localized increases in emissions because of the Proposed Amendments could occur near biofuel production facilities and routes for biofuel feedstock and finished fuel transportation. These potential local increases in emissions would be largely dependent on the extent and location of increased biofuel production. Because the LCFS does not specify the specific sites at which alternative fuels are produced, both the extent of increased biofuel production and the location of potential new biofuel facilities cannot be known at this time and would be too speculative to quantify.

As discussed above, CARB does not believe significant localized increases are likely, and anticipates overall beneficial long-term operational impacts statewide. Nevertheless, in an abundance of caution and for the purposes of complete public disclosure, CARB concludes that long-term local air quality impacts associated with the Proposed Amendments could be potentially significant and unavoidable.

Mitigation Measure 3-2

The Regulatory Setting in Attachment A includes applicable laws and regulations that relate to air quality. CARB 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 typically 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. The following recognized practices are routinely required to avoid and/or minimize impacts on air quality:

- Proponents of new or modified facilities constructed and operated 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 jurisdiction with land use authority would determine that the environmental review process complied with CEQA and other applicable regulations, prior to project approval.

- Based on the results of the environmental review, proponents would implement all feasible mitigation identified in the environmental document to reduce or substantially lessen the operational-related air quality impacts of the project.
- Project proponents would apply for, secure, and comply with all appropriate air quality permits for project operation from the local agencies with air quality jurisdiction and from other applicable agencies, if appropriate, prior to commencement of project operation.
- Project proponents would comply with the federal Clean Air 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., 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 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 EIA 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 significant impacts. Although unlikely after implementation of Mitigation Measure 1-2, it is possible that significant impacts on air quality resources could still occur.

Consequently, while CARB does not believe significant localized increases are likely and anticipates overall beneficial long-term operational impacts and if they were to exist impacts should be reduced to a less than significant level by land use and/or permitting agency conditions of approval, this EIA takes the conservative approach in its post-mitigation significance conclusion and discloses, for CEQA compliance purposes, that long-term operational-related air quality impacts resulting from the operation of new or modified facilities associated with the Proposed Amendments would remain **significant and unavoidable**.

Impact 3-3: Short-Term Construction-Related and Long-Term Operational Impacts from Odors

Reasonably foreseeable compliance responses associated with the Proposed Amendments include the following responses, which could result in changes to the existing physical environment: modifications to cultivation volume and transport of feedstock; changes to location and types of feedstock; new or modified processing facilities for feedstock and finished fuel production; increased transportation of finished

alternative fuels to blending terminals or retail fuel sites; construction and operation of new facilities to produce renewable diesel, renewable gasoline, AJF, and renewable propane; construction of biomass gasification and pyrolysis systems for hydrogen and renewable natural gas production; construction of new anaerobic facilities to digest manure from dairies, sewage from wastewater treatment plants, and organic waste diverted from landfills; construction of infrastructure to collect biogas and produce methane; construction of stand-alone and bolt-on cellulosic processing units for renewable fuels production; increase in collection of yard waste or removal of forest litter and agricultural residues; construction of electrolysis units and substitution of renewable natural gas for fossil gas in production of hydrogen; construction of solar and wind electricity generation projects; modification to existing or new industrial facilities to capture CO_2 emissions; construction of new infrastructure such as pipelines, wells and other surface facilities; construction and operation of additional refueling hydrogen stations and EV charging stations; modifications to electricity distribution and transmission infrastructure; modifications to existing crude production facilities to accommodate solar and wind electricity, solar heat, and/or solar steam generation; electrification of equipment and installation of renewable electricity and battery storage systems at petroleum refineries and alternative fuel production facilities; expansion of public transit systems; and land use changes and changes to fuel-associated shipment patterns.

Although it is reasonably foreseeable that construction activities could occur, there is uncertainty as to the exact location of any new facilities or modification of existing facilities. Typically, such facilities would be located in industrial or rural areas with appropriate zoning to accommodate these specific activities. Short-term construction activities could generate short-term odors associated with operation of diesel equipment; however, such activities would be short-term in nature and would not be expected to adversely affect long-term air quality.

With respect to long-term operational impacts associated with odors, new facilities and equipment constructed as a result of the Proposed Amendments would not add to odors but could help reduce existing odors at the sites. Implementation of the Proposed Amendments would incentivize the collection and use of biomethane gas from dairies, landfills, and wastewater treatment plants. The release of methane gas from these sites is usually accompanied by odorous compounds (e.g., ammonia and hydrogen sulfide). Generally, odor is considered a perceived nuisance and an environmental impact. Factors that would affect odor impacts include the design of collection facilities and exposure duration. Methane gas collection systems at landfills would involve wells for extraction of landfill methane produced from decomposing waste, and wastewater treatment plants would modify existing digesters in enclosed operations. Wastewater treatment plants also typically maintain odor control systems to address fugitive emissions at existing facilities. Manure management at dairies typically involves flushing and/or scraping manure into on-site storage ponds or stockpiles. Manure in these storage ponds and stockpiles naturally undergo decomposition, and as a result, odorous compounds are released into the environment.

However, the implementation of new digester facilities at existing livestock operations would result in the manure being placed into the digester rather than into on-site storage ponds or stockpiles, potentially reducing odors that would otherwise occur without the new digester facilities. This would limit open air degradation (resulting in the breakdown of volatile organic compounds through anaerobic processes that would occur in the closed system) and would result in more control over the exhaust emissions. While digesters constructed for manure would perform anaerobic digestion in a closed system, emissions of odorous compounds could still be released into the environment from the overall site. While digesters typically result in more control over facility odor emissions, fugitive emissions of odorous compounds could be offensive to sensitive receptors, depending on their proximity, the design of anaerobic digesters, and exposure duration. Thus, short-term construction-related odor impacts and long-term operational odor impacts associated with the Proposed Amendments would be **less than significant**.

4. Biological Resources

Impact 4-1: Short-Term Construction-Related Impacts on Biological Resources

Reasonably foreseeable compliance responses associated with the Proposed Amendments include the following responses, which could result in changes to the existing physical environment: modifications to cultivation volume and transport of feedstock; changes to location and types of feedstock; new or modified processing facilities for feedstock and finished fuel production; increased transportation of finished alternative fuels to blending terminals or retail fuel sites; construction and operation of new facilities to produce renewable diesel, renewable gasoline, AJF, and renewable propane; construction of biomass gasification and pyrolysis systems for hydrogen and renewable natural gas production; construction of new anaerobic facilities to digest manure from dairies, sewage from wastewater treatment plants, and organic waste diverted from landfills; construction of infrastructure to collect biogas and produce methane; construction of stand-alone and bolt-on cellulosic processing units for renewable fuels production; increase in collection of yard waste or removal of forest litter and agricultural residues; construction of electrolysis units and substitution of renewable natural gas for fossil gas in production of hydrogen; construction of solar and wind electricity generation projects; modification to existing or new industrial facilities to capture CO_2 emissions; construction of new infrastructure such as pipelines, wells and other surface facilities; construction and operation of additional refueling hydrogen stations and EV charging stations; modifications to electricity distribution and transmission infrastructure; modifications to existing crude production facilities to accommodate solar and wind electricity, solar heat, and/or solar steam generation; electrification of equipment and installation of renewable electricity and battery storage systems at petroleum refineries and alternative fuel production facilities; expansion of public transit systems; and land use changes and changes to fuel-associated shipment patterns.

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 paving of parking lots, delivery areas, and roadways.

The biological resources that could be affected by the construction and operation of new or modified manufacturing plants or renewable energy projects would depend on the specific location of any necessary construction and its environmental setting. 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 Proposed Amendments would be significant.

Potential biological resource impacts could be reduced to a less-than-significant level by mitigation measures prescribed by local, state, federal, or other land use or permitting agencies (either in the U.S. or abroad) with approval authority over the particular development projects. However, because CARB has no land use authority, mitigation is not within its purview to reduce significant impacts to less than significant levels.

Mitigation Measure 4-1

The Regulatory Setting in Attachment A includes applicable laws and regulations that relate to biological resources. CARB 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. The following recognized practices are routinely required to avoid and/or minimize impacts on biological resources:

- Proponents of construction activities implemented as a result of reasonably foreseeable compliance responses associated with the Proposed Amendments 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 impacts on biological resources associated with the project.
- Actions required to mitigate potentially significant biological impacts may include the following; however, any mitigation specifically required for a new or modified facilities or other activities 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 delineation of on-site state or federally protected wetlands or other sensitive habitats (e.g., riparian habitat, sensitive natural communities). 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 (CWA) 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 Pollutant Discharge Elimination System 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 EIA 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 significant impacts. Although unlikely after implementation of Mitigation Measure 4-1, it is possible that significant impacts on biological resources could still occur.

Consequently, while impacts could likely be reduced to a less-than-significant level with mitigation measures imposed by the land use and/or permitting agencies acting as lead agencies for these individual projects under CEQA, if and when a project proponent seeks a permit for compliance-response related project, this ~~Draft~~ Final EIA takes the conservative approach in its post-mitigation significance conclusion and discloses, for CEQA compliance purposes, that short-term construction-related impacts on biological resources associated with the Proposed Amendments would remain **significant and unavoidable**.

Impact 4-2: Long-Term Operation-Related Impacts on Biological Resources

Reasonably foreseeable compliance responses associated with the Proposed Amendments include the following responses, which could result in changes to the existing physical environment: modifications to cultivation volume and transport of feedstock; changes to location and types of feedstock; new or modified processing facilities for feedstock and finished fuel production; increased transportation of finished alternative fuels to blending terminals or retail fuel sites; construction and operation of new facilities to produce renewable diesel, renewable gasoline, AJF, and renewable propane; construction of biomass gasification and pyrolysis systems for hydrogen and renewable natural gas production; construction of new anaerobic facilities to digest manure from dairies, sewage from wastewater treatment plants, and organic waste diverted from landfills; construction of infrastructure to collect biogas and produce methane; construction of stand-alone and bolt-on cellulosic processing units for renewable fuels production; increase in collection of yard waste or removal of forest litter and agricultural residues; construction of electrolysis units and substitution of renewable natural gas for fossil gas in production of hydrogen; construction of solar and wind electricity generation projects; modification to existing or new industrial facilities to capture CO_2 emissions; construction of new infrastructure such as pipelines, wells and other surface facilities; construction and operation of additional refueling hydrogen

stations and EV charging stations; modifications to electricity distribution and transmission infrastructure; modifications to existing crude production facilities to accommodate solar and wind electricity, solar heat, and/or solar steam generation; electrification of equipment and installation of renewable electricity and battery storage systems at petroleum refineries and alternative fuel production facilities; expansion of public transit systems; and land use changes and changes to fuel-associated shipment patterns.

Implementation of the Proposed Amendments may result in an increased demand for agricultural feedstocks, including sugarcane, sorghum, and soy. In some cases, this increase can be accomplished using marginal lands (i.e., lands unsuitable for food crops), or through the increased production of feedstocks on existing agricultural lands (i.e., 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.

CARB estimates the indirect land use change effects of biofuel crop production using the Global Trade Analysis Project (GTAP) model, which is a computer model developed and supported by researchers at Purdue University. Within the GTAP's scope, there are 111 world regions, some of which consist of single countries, others of which are comprised of multiple neighboring countries. Each region contains data tables that describe every national economy in that region, as well as all significant intra- and inter-regional trade relationships. The data for this model are contributed and maintained by more than 6,000 local experts.

GTAP model analysis considers life cycle CI impacts related to potential or actual deforestation and conversion of other land use types. When a life cycle pathway is developed for a crop-based biofuel, an indirect land use change (LUC) value is developed using the GTAP model for land that would be converted to agricultural production because of increased demand for that crop. The approach accounts for land conversions in all regions of the world based on available land and likelihood of land to be converted as demand for land goes up. The methodology attributes new land to come from forest lands, pastureland, and cropland. A fuel that is more likely to displace sensitive lands, such as forests, would have a higher LUC value, making it less attractive for use in complying with the Proposed Amendments. The proposed sustainability criteria would additionally help protect against potential future land use impacts.

Waste-derived biofuels would not require land conversion because they use waste biomass material from existing agricultural operations (i.e., no attendant deforestation) and are assigned "zero" LUC values. Most gasoline contains up to 10% ethanol in the U.S. to meet oxygenation requirements. Carbon intensity (CI) values for land use changes incentivizes the production and use of low-carbon sources, such as

waste-derived biofuels, and may decrease the potential for deforestation and other conversion of lands not currently in agricultural production.

Depending on the type of crop, location, and need to convert lands, habitat destruction could occur, resulting in the loss of biodiversity. Removal of natural undeveloped lands could lead to irreversible non-GHG impacts, such as loss of species populations, or impacts with a payback ("grow back") period of up to a few hundred years.[66] The location of new crop lands may also affect conservation plans or disrupt important migratory routes. Indirect effects could occur as well, such as increased pesticide and nutrient use, the runoff of which could be detrimental to individual species. Even with land use change quantification and crop-based biofuels sustainability criteria as guardrails, there is still some potential for changes in land use, which could have adverse effects on biological species and their habitats.

Therefore, long-term operation-related impacts to biological resources from implementation of the Proposed Amendments would be significant.

Potential biological resource impacts could be reduced to a less-than-significant level by mitigation measures prescribed by local, state, federal, or other land use or permitting agencies (either in the U.S. or abroad) with approval authority over the particular development projects. However, because CARB has no land use authority, mitigation is not within its purview to reduce significant impacts to less-than-significant levels.

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 EIA 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 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 EIA takes the conservative approach in its post-mitigation significance conclusion and discloses, for CEQA compliance purposes, that long-term operational impacts associated with land use conversion to biological resources associated with the Proposed Amendments would be **significant and unavoidable.**

[66] Lapola, D. M., R. Schaldach, J. Alcamo, A. Bondeau, J. Koch, C. Koelking, & Priess, J. A., *Indirect Land-Use Changes Can Overcome Carbon Savings from Biofuels in Brazil*. PNAS 107 (8): 3388–3393. February 23, 2010. *http://www.pnas.org/content/107/8/3388.full.pdf+html*

5. Cultural Resources

Impact 5-1: Short-Term Construction-Related and Long-Term Operational Impacts on Cultural Resources

Reasonably foreseeable compliance responses associated with the Proposed Amendments include the following responses, which could result in changes to the existing physical environment: modifications to cultivation volume and transport of feedstock; changes to location and types of feedstock; new or modified processing facilities for feedstock and finished fuel production; increased transportation of finished alternative fuels to blending terminals or retail fuel sites; construction and operation of new facilities to produce renewable diesel, renewable gasoline, AJF, and renewable propane; construction of biomass gasification and pyrolysis systems for hydrogen and renewable natural gas production; construction of new anaerobic facilities to digest manure from dairies, sewage from wastewater treatment plants, and organic waste diverted from landfills; construction of infrastructure to collect biogas and produce methane; construction of stand-alone and bolt-on cellulosic processing units for renewable fuels production; increase in collection of yard waste or removal of forest litter and agricultural residues; construction of electrolysis units and substitution of renewable natural gas for fossil gas in production of hydrogen; construction of solar and wind electricity generation projects; modification to existing or new industrial facilities to capture CO_2 emissions; construction of new infrastructure such as pipelines, wells and other surface facilities; construction and operation of additional refueling hydrogen stations and EV charging stations; modifications to electricity distribution and transmission infrastructure; modifications to existing crude production facilities to accommodate solar and wind electricity, solar heat, and/or solar steam generation; electrification of equipment and installation of renewable electricity and battery storage systems at petroleum refineries and alternative fuel production facilities; expansion of public transit systems; and land use changes and changes to fuel-associated shipment patterns.

Construction activities could require disturbance of undeveloped area, such as clearing of vegetation, earth movement and grading, trenching for utility lines and gas pipelines, 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. However, it is not known what kinds of construction or modifications would occur, and whether ground disturbance would be needed because the specific design details, siting locations, and soil compaction details are not known at this time. As a result, there is uncertainty as to the presence of culturally, historically, archaeologically, and paleontologically significant resources at future project sites. Therefore, it is foreseeable that undocumented cultural or paleontological resources could be unearthed or otherwise discovered during ground-disturbing and construction activities.

The cultural resources that could potentially be affected by ground disturbance activities could include, but are not limited to, prehistoric and historical archaeological sites, 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 some historic, archeological, and paleontological resources can also be found or remain within or adjacent to developed areas, these culturally sensitive resources could also be adversely affected by construction of new facilities.

Unique archaeological or historical resources might include stone tools, tool-making debris, stone milling tools, shell or bone items, and fire-affected rock or soil darkened by cultural activities. Paleontological resources include fossils. Historic materials might include metal, glass, or ceramic artifacts. Ground disturbance, such as clearing of vegetation, earth movement and grading, trenching for utility lines, erection of new buildings, and paving of lots and roadway associated with the construction of new infrastructure and facilities, could damage cultural, prehistoric, and historic sites; tribal cultural resources (TCRs); paleontological resources; historic buildings; and heritage landscapes. The reasonably foreseeable compliance responses that could entail demolition activity (e.g., the construction of new facilities on sites that support existing structures) could result in the loss of a historically or culturally significant structure. Future new facilities could be located in a region where undocumented prehistoric or historic-era cultural resources may be found.

Implementation of the Proposed Amendments may result in an increase in production of fuels from a variety of different feedstocks, including waste biomass or dedicated crops. Adverse long-term operational impacts could include shifts in land use to produce such feedstocks in areas of cultural significance.

In general, ground disturbing activities as a result of future construction would be consistent with the areas' current and future zoning (e.g., industrial, agricultural). Regardless, there is a possibility that these activities may occur in or adjacent to a region consisting of known significant prehistoric and/or historic-era cultural resources. Additionally, while it is reasonable to anticipate that land use policies controlling the location of new industrial facilities would generally avoid areas that have not been disturbed that are known to contain or known to likely contain significant cultural resources, these areas may not always be feasibly avoided. It is also possible that ground disturbance would damage previously unknown/undocumented cultural resources. Therefore, it is foreseeable that known and/or undocumented cultural or paleontological resources could be unearthed or otherwise discovered during ground-disturbing and construction activities. Unique archaeological or historical resources might include stone tools, tool-making debris, stone milling tools, shell or bone items, and fire-affected rock or soil darkened by cultural activities. Paleontological resources

include fossils. Historic materials might include metal, glass, or ceramic artifacts. Human remains could also be present outside of dedicated cemeteries. Finally, historic structures could be removed or damaged if present within or adjacent to a proposed construction site. TCRs are addressed below in *Impact 18-1, "Short-Term Construction-Related and Long-Term Operation-Related Impacts to Tribal Cultural Resources."*

Following construction, operation of facilities or infrastructure associated with the compliance responses would not require ground disturbance in addition to that performed during construction and modification because operation activities would occur within the footprint of the constructed or modified facility. Therefore, most operational activities would not have the potential to affect archaeological, paleontological, or historical resources. The presence of new structures or infrastructure may, however, change the visual setting of the surrounding area, which could adversely affect historic resources and districts with an important visual component. For example, although it is unlikely such a facility would be sited in a historic district, a new structure or infrastructure may not be consistent with the visual character of a historic district. As a result, operational impacts could be significant.

Therefore, short-term construction-related and long-term operational-related impacts to cultural resources associated with implementation of the Proposed Amendments would be significant.

Potential cultural resource impacts could be reduced to a less-than-significant level by mitigation measures prescribed by local, state, federal, or other land use or permitting agencies (either in the U.S. or abroad) with approval authority over the particular development projects. However, because CARB has no land use authority, mitigation is not within its purview to reduce significant impacts to less-than-significant levels.

Mitigation Measure 5-1

The Regulatory Setting in Attachment A includes applicable laws and regulations that relate to cultural resources. CARB 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. The following recognized practices are routinely required to avoid and/or minimize impacts on cultural resources:

- Proponents of construction activities implemented as a result of reasonably foreseeable compliance responses associated with the Proposed Amendments 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 avoid, reduce or substantially lessen the potentially significant impacts on cultural resources associated with the project.
- Actions required to mitigate potentially significant cultural resources impacts may include the following; however, any mitigation specifically required for a 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.
    - In the event that cultural resources are discovered during project activities, all work in the immediate vicinity of the find shall cease, and a qualified cultural resource specialist (e.g., archaeologist, architectural historian, depending on the resource identified) meeting Secretary of Interior standards shall be hired to assess the find. Work on the other portions of the project outside of the buffered area may continue during this assessment period.
        - Seek guidance from the state and federal lead agencies, as appropriate, for coordination of Nation-to-Nation consultations with the Native American Tribes.
    - Regulated entities shall consult with lead agencies early in the planning process to identify the potential presence of cultural properties. The agencies shall 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.
    - If a resource determined to be significant by the qualified archaeologist or architectural historian (i.e., because the find is determined to constitute either an historical resource, cultural resource, or a unique archaeological resource), the archaeologist shall work with the project proponent to avoid disturbance to the resource, and if complete avoidance is not possible, follow accepted professional standards in recording any find. Preservation in place is the preferred manner of mitigating impacts to archaeological sites. For historically significant structures, if avoidance is infeasible, an appropriate documentation plan (e.g., recordation consistent with Historic American Buildings Survey Guidelines) shall be required.

- Regulated entities shall define the area of potential effect (APE) for each project, which is the area where project construction and operation may directly or indirectly cause alterations in the character or use of historic properties. The APE shall 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.

- Regulated entities shall 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 Paleontological Resources: Standard Procedures, Society of Vertebrate Paleontology.[67]

- Regulated entities shall conduct initial scoping assessments to determine whether proposed construction activities, if any, could 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 shall be conducted by the qualified paleontological resources specialist in accordance with applicable agency requirements.

- If human remains or funerary objects are encountered during any activities associated with the project, work in the immediate vicinity and within a reasonable buffer zone, shall cease and the County Coroner shall be contacted pursuant to state Health and Safety Code Section 7050.5 and that code enforced for the duration of the project.

- The regulated entity's qualified paleontological resources specialist shall 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

[67] Society of Vertebrate Paleontology, *Standard Procedures for the Assessment and Mitigation of Adverse Impacts to Paleontological Resources*. 2010. *https://vertpaleo.org/wp-content/uploads/2021/01/SVP_Impact_Mitigation_Guidelines.pdf*

possible, prepare a paleontological resources management and mitigation plan that addresses the following steps:

- Conduct a preliminary survey (if not conducted earlier) and surface salvage prior to construction.
- Implement physical and administrative protective measures and protocols, such as halting work, to be implemented in the event of fossil discoveries.
- Monitor and salvage during excavation.
- Prepare specimens.
- Identify, catalog, curate, and store.
- Prepare a final report of the findings and their significance.
- Choose sites that avoid areas of special scientific value.

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 EIA 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 significant impacts. Although unlikely after implementation of Mitigation Measure 5-1, it is possible that significant impacts on cultural resources could still occur.

Consequently, while impacts could likely be reduced to a less-than-significant level with mitigation measures imposed by the land use and/or permitting agencies acting as lead agencies for these individual projects under CEQA, if and when a project proponent seeks a permit for compliance-response related project, this ~~Draft~~ Final EIA 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 cultural resources associated with the Proposed Amendments would remain **significant and unavoidable**.

6. Energy

Impact 6-1: Short-Term Construction-Related Impacts to Energy Resources

Reasonably foreseeable compliance responses associated with the Proposed Amendments include the following responses, which could result in changes to the existing physical environment: modifications to cultivation volume and transport of feedstock; changes to location and types of feedstock; new or modified processing facilities for feedstock and finished fuel production; increased transportation of finished alternative fuels to blending terminals or retail fuel sites; construction and operation of new facilities to produce renewable diesel, renewable gasoline, AJF, and renewable propane; construction of biomass gasification and pyrolysis systems for hydrogen and

renewable natural gas production; construction of new anaerobic facilities to digest manure from dairies, sewage from wastewater treatment plants, and organic waste diverted from landfills; construction of infrastructure to collect biogas and produce methane; construction of stand-alone and bolt-on cellulosic processing units for renewable fuels production; increase in collection of yard waste or removal of forest litter and agricultural residues; construction of electrolysis units and substitution of renewable natural gas for fossil gas in production of hydrogen; construction of solar and wind electricity generation projects; modification to existing or new industrial facilities to capture CO_2 emissions; construction of new infrastructure such as pipelines, wells and other surface facilities; construction and operation of additional refueling hydrogen stations and EV charging stations; modifications to electricity distribution and transmission infrastructure; modifications to existing crude production facilities to accommodate solar and wind electricity, solar heat, and/or solar steam generation; electrification of equipment and installation of renewable electricity and battery storage systems at petroleum refineries and alternative fuel production facilities; expansion of public transit systems; and land use changes and changes to fuel-associated shipment patterns.

Temporary increases in energy demand associated with new facilities would include fuels used during construction, and gas and electricity 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.

While all aforementioned compliance responses would require the consumption of energy resources, these actions would enable the manufacture and use of low-CI fuels to accelerate the targets of the Proposed Amendments and would not involve the wasteful or inefficient use of energy. In fact, the reasonably foreseeable compliance responses, in particular those that would result in increased production of low-CI fuels would contribute new energy to the system to replace existing fossil fuel usage. A major objective of the Proposed Amendments is to reduce GHG emissions in the long-term and would require some energy to construct the necessary infrastructure and technical components to support this objective. Therefore, while energy demand would increase during the construction of future projects in response to implementation of the Proposed Amendments, these energy expenditures would be necessary to facilitate the actions that would result in environmental benefits such as reduced air pollution and GHG emissions and reduced demand on the existing fossil fueled energy resources. Therefore, short-term energy consumption would not be considered unnecessary. Moreover, energy needed to power necessary equipment would not be anticipated to generate high electrical demand beyond baseline energy load, as construction contractors and managers typically manage fuel and energy costs and therefore do not typically allow for substantial fuel and other energy waste. Short-term construction-

related energy impacts associated with the Proposed Amendments would be **less than significant**.

Impact 6-2: Long-Term Operational-Related Impacts to Energy Resources

Reasonably foreseeable compliance responses associated with the Proposed Amendments include the following responses, which could result in changes to the existing physical environment: modifications to cultivation volume and transport of feedstock; changes to location and types of feedstock; new or modified processing facilities for feedstock and finished fuel production; increased transportation of finished alternative fuels to blending terminals or retail fuel sites; construction and operation of new facilities to produce renewable diesel, renewable gasoline, AJF, and renewable propane; construction of biomass gasification and pyrolysis systems for hydrogen and renewable natural gas production; construction of new anaerobic facilities to digest manure from dairies, sewage from wastewater treatment plants, and organic waste diverted from landfills; construction of infrastructure to collect biogas and produce methane; construction of stand-alone and bolt-on cellulosic processing units for renewable fuels production; increase in collection of yard waste or removal of forest litter and agricultural residues; construction of electrolysis units and substitution of renewable natural gas for fossil gas in production of hydrogen; construction of solar and wind electricity generation projects; modification to existing or new industrial facilities to capture CO_2 emissions; construction of new infrastructure such as pipelines, wells and other surface facilities; construction and operation of additional refueling hydrogen stations and EV charging stations; modifications to electricity distribution and transmission infrastructure; modifications to existing crude production facilities to accommodate solar and wind electricity, solar heat, and/or solar steam generation; electrification of equipment and installation of renewable electricity and battery storage systems at petroleum refineries and alternative fuel production facilities; expansion of public transit systems; and land use changes and changes to fuel-associated shipment patterns.

In the long term, implementation of the Proposed Amendments is anticipated to result in an increase in production of low-CI fuels for California's market that would displace existing fossil fuel energy used in the transportation sector. This would be realized through operation of new processing plants which will impact energy demand. The Proposed Amendments could result in a change in energy resources needed to produce the incentivized transportation fuels, such as electricity to produce hydrogen via electrolysis and natural gas and electricity used to produce renewable diesel. These potential increases would not result in any significant impacts due to wasteful, inefficient, or unnecessary consumption of energy as a result of the Proposed Amendments. In addition, LCFS support for adoption of zero emission vehicles, which are more energy efficient than internal combustion engine vehicles, will also support a reduction in total energy demand needed for transportation fuels.

The 2022 Scoping Plan to Achieve Carbon Neutrality (2022 Scoping Plan Update) provides the State with the framework for achieving carbon neutrality by 2045 as

directed by AB 1279 and includes a wide range of actions, regulations, and policies that focus on reducing GHGs and overall energy consumption by 2045. The 2022 Scoping Plan Update identifies the low-CI fuels generated and consumed from implementation of the Proposed Amendments as one statewide component to achieve the goals of carbon neutrality by 2045. Because the Proposed Amendments would further the goal of carbon neutrality by 2045 as detailed in the 2022 Scoping Plan Update, which serves as the most appropriate plan to conserve energy and promote renewable energy, the Proposed Amendments would not conflict with an applicable energy plan.

The anticipated reasonably foreseeable compliance responses associated with the Proposed Amendments would not result in the wasteful, inefficient, or unnecessary consumption of energy, nor would it conflict with the 2022 Scoping Plan Update. Therefore, long-term operation-related energy impacts would be **less than significant.**

7. Geology and Soils

Impact 7-1: Short-Term Construction-Related and Long-Term Operational-Related Impacts to Geology and Soils

Reasonably foreseeable compliance responses associated with the Proposed Amendments include the following responses, which could result in changes to the existing physical environment: modifications to cultivation volume and transport of feedstock; changes to location and types of feedstock; new or modified processing facilities for feedstock and finished fuel production; increased transportation of finished alternative fuels to blending terminals or retail fuel sites; construction and operation of new facilities to produce renewable diesel, renewable gasoline, AJF, and renewable propane; construction of biomass gasification and pyrolysis systems for hydrogen and renewable natural gas production; construction of new anaerobic facilities to digest manure from dairies, sewage from wastewater treatment plants, and organic waste diverted from landfills; construction of infrastructure to collect biogas and produce methane; construction of stand-alone and bolt-on cellulosic processing units for renewable fuels production; increase in collection of yard waste or removal of forest litter and agricultural residues; construction of electrolysis units and substitution of renewable natural gas for fossil gas in production of hydrogen; construction of solar and wind electricity generation projects; modification to existing or new industrial facilities to capture CO_2 emissions; construction of new infrastructure such as pipelines, wells and other surface facilities; construction and operation of additional refueling hydrogen stations and EV charging stations; modifications to electricity distribution and transmission infrastructure; modifications to existing crude production facilities to accommodate solar and wind electricity, solar heat, and/or solar steam generation; electrification of equipment and installation of renewable electricity and battery storage systems at petroleum refineries and alternative fuel production facilities; expansion of public transit systems; and land use changes and changes to fuel-associated shipment patterns.

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 areas.

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.

Mitigation Measure 7-1

The Regulatory Setting in Attachment A includes applicable laws and regulations that relate to geology and soils. CARB 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. The following recognized practices are routinely required to avoid and/or minimize impacts on geology and soils:

- Proponents of new or modified facilities constructed because of reasonably foreseeable compliance responses to new regulations 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 would certify that the environmental document was prepared in compliance with applicable regulations and would approve the project for development.
- Based on the results of the environmental review, proponents shall implement all mitigation measures identified in the environmental document to reduce or substantially lessen the environmental impacts related to seismic instability, fault rupture, soil erosion, landslides, loss of topsoil. The definition of 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 will be determined by the local lead agency.

- Prior to the issuance of any development permits, proponents of new or modified facilities or infrastructure shall 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 shall provide a complete site grading plan, and drainage, erosion, and sediment control plan with applications to applicable lead agencies. Proponents will 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 shall 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 land use and/or permitting agencies for individual projects, and the programmatic level of analysis associated with this ~~Draft~~ Final EIA 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 significant impacts. Although unlikely after implementation of Mitigation Measure 7-1, it is possible that significant impacts on geology and soils could still occur.

Consequently, while impacts could likely be reduced to a less-than-significant level with mitigation measures imposed by the land use and/or permitting agencies acting as lead agencies for these individual projects under CEQA, if and when a project proponent seeks a permit for compliance-response related projects, this ~~Draft~~ Final EIA takes the conservative approach in its post-mitigation significance conclusion and discloses, for CEQA compliance purposes, that long-term operational impacts on geology and soils associated with the Proposed Amendments would remain **significant and unavoidable**.

Impact 7-2: Long-Term Operational Impacts to Geology and Soil Associated with Land Use Changes

Reasonably foreseeable compliance responses associated with the Proposed Amendments include the following responses, which could result in changes to the existing physical environment: modifications to cultivation volume and transport of feedstock; changes to location and types of feedstock; new or modified processing facilities for feedstock and finished fuel production; increased transportation of finished

alternative fuels to blending terminals or retail fuel sites; construction and operation of new facilities to produce renewable diesel, renewable gasoline, AJF, and renewable propane; construction of biomass gasification and pyrolysis systems for hydrogen and renewable natural gas production; construction of new anaerobic facilities to digest manure from dairies, sewage from wastewater treatment plants, and organic waste diverted from landfills; construction of infrastructure to collect biogas and produce methane; construction of stand-alone and bolt-on cellulosic processing units for renewable fuels production; increase in collection of yard waste or removal of forest litter and agricultural residues; construction of electrolysis units and substitution of renewable natural gas for fossil gas in production of hydrogen; construction of solar and wind electricity generation projects; modification to existing or new industrial facilities to capture CO_2 emissions; construction of new infrastructure such as pipelines, wells and other surface facilities; construction and operation of additional refueling hydrogen stations and EV charging stations; modifications to electricity distribution and transmission infrastructure; modifications to existing crude production facilities to accommodate solar and wind electricity, solar heat, and/or solar steam generation; electrification of equipment and installation of renewable electricity and battery storage systems at petroleum refineries and alternative fuel production facilities; expansion of public transit systems; and land use changes and changes to fuel-associated shipment patterns.

Soil erosion from farming threatens the productivity of agricultural land and causes many problems elsewhere in the environment. An average of 10 times as much soil erodes from American agricultural fields as is replaced by natural soil formation processes. Because it takes up to 300 years for 1 inch of agricultural topsoil to form, soil that is lost is essentially irreplaceable.[68] Soil erosion from intensive forestry practices and heavy machinery use can cause many problems in the forest environment. The amount of erosion varies considerably from one field to another, depending on soil type, slope of the field, drainage patterns, and crop management practices, and the effects of the erosion also vary. Areas with deep organic loams are better able to sustain erosion without loss of productivity than are areas where topsoil is shallower.

Even when soil erosion is not excessive, intensive agriculture or removal of agricultural and forest residues can impair soil quality by depleting the natural supplies of trace elements and organic matter. In natural ecosystems, soil fertility is maintained by the diverse contributions and recycling of nutrients by a wide range of plant and animal species. When this diversity is replaced by a single species grown year after year, some trace elements are depleted if not replaced by fertilization. The organic content of the soil also diminishes unless crop residues or other organic materials are supplied in sufficient quantities to replace that consumed over time.

[68] Trautmann, N.M. & Porter, K.S., Modern Agriculture: Its Effects on the Environment. Cornell University Cooperative Extension. 2012. (Accessed on January 11, 2018).

Long-term operational impacts to geology and soil associated with the Proposed Amendments associated with changes in land use could change soil properties such as erosion potential, quality, and drainage capability. Because the location of future lands used to produce biofuels, and the extent to which these impacts would result, is unknown, this impact would be significant.

Potential soil and geologic resource impacts could be reduced to a less-than-significant level by mitigation measures prescribed by local, state, federal, or other land use or permitting agencies (either in the U.S. or abroad) with approval authority over the particular development projects. However, because CARB has no land use authority, mitigation is not within its purview to reduce significant impacts to less-than-significant levels.

Mitigation Measure 7-2

The Regulatory Setting in Attachment A includes applicable laws and regulations that relate to geology and soils. CARB 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. The following recognized practices are routinely required to avoid and/or minimize impacts on geology and soils:

- Proponents of new or modified facilities constructed because of reasonably foreseeable compliance responses to new regulations 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 would certify that the environmental document was prepared in compliance with applicable regulations and would approve the project for development.
- Based on the results of the environmental review, proponents shall implement all mitigation measures identified in the environmental document to reduce or substantially lessen the environmental impacts related to seismic instability, fault rupture, soil erosion, landslides, loss of topsoil. The definition of 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 will be determined by the local lead agency.
    - Prior to the issuance of any development permits, proponents of new or modified facilities or infrastructure shall 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 shall provide a complete site grading plan, and drainage, erosion, and sediment control plan with applications to applicable lead agencies. Proponents will 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 shall 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 land use and/or permitting agencies for individual projects, and the programmatic level of analysis associated with this ~~Draft~~ Final EIA 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 significant impacts. Although unlikely after implementation of Mitigation Measure 7-2, it is possible that significant impacts on geology and soils could still occur.

Consequently, while impacts could likely be reduced to a less-than-significant level with mitigation measures imposed by the land use and/or permitting agencies acting as lead agencies for these individual projects under CEQA, if and when a project proponent seeks a permit for compliance-response related projects, this ~~Draft~~ Final EIA takes the conservative approach in its post-mitigation significance conclusion and discloses, for CEQA compliance purposes, that long-term operational impacts on geology and soils associated with the Proposed Amendments would remain **significant and unavoidable**.

8. Greenhouse Gas Emissions

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

Reasonably foreseeable compliance responses associated with the Proposed Amendments include the following responses, which could result in changes to the existing physical environment: modifications to cultivation volume and transport of feedstock; changes to location and types of feedstock; new or modified processing facilities for feedstock and finished fuel production; increased transportation of finished alternative fuels to blending terminals or retail fuel sites; construction and operation of new facilities to produce renewable diesel, renewable gasoline, AJF, and renewable propane; construction of biomass gasification and pyrolysis systems for hydrogen and renewable natural gas production; construction of new anaerobic facilities to digest manure from dairies, sewage from wastewater treatment plants, and organic waste

diverted from landfills; construction of infrastructure to collect biogas and produce methane; construction of stand-alone and bolt-on cellulosic processing units for renewable fuels production; increase in collection of yard waste or removal of forest litter and agricultural residues; construction of electrolysis units and substitution of renewable natural gas for fossil gas in production of hydrogen; construction of solar and wind electricity generation projects; modification to existing or new industrial facilities to capture CO_2 emissions; construction of new infrastructure such as pipelines, wells and other surface facilities; construction and operation of additional refueling hydrogen stations and EV charging stations; modifications to electricity distribution and transmission infrastructure; modifications to existing crude production facilities to accommodate solar and wind electricity, solar heat, and/or solar steam generation; electrification of equipment and installation of renewable electricity and battery storage systems at petroleum refineries and alternative fuel production facilities; expansion of public transit systems; and land use changes and changes to fuel-associated shipment patterns.

Construction of facilities would require use of vehicles and equipment that would consume fuel and emit GHGs for construction activities, materials transport, and worker commutes. Construction-related GHG emissions would be temporary and last only for the duration of construction. 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 ($MTCO_2e$) per 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 the California Emissions Estimator Model (CalEEMod), OFFROAD 2007, and CARB's California's EMissionsFACtor (EMFAC) models. These models require consideration of assumptions, including construction timelines and energy demands (i.e., fuel and electricity).

Air districts differ in their treatment of construction emissions. For instance, the Sacramento Metropolitan Air Quality Management District recommends that construction emissions be compared to a bright-line threshold of significance of 1,100 $MTCO_2e$ per year.[69] The Placer County Air Pollution Control District recommends that the significance of a project's construction emissions be compared to a 10,000 $MTCO_2e$ per year mass emissions threshold.[70] By contrast, the Bay Area Air Quality Management District (BAAQMD), does not recommend a numerical threshold for assessing the

[69] Sacramento Metropolitan Air Quality Management District, *Chapter 6, "Greenhouse Gas Emissions*." In CEQA Guide. 2021. *https://www.airquality.org/LandUseTransportation/Documents/Ch6GHG2-26-2021.pdf*

[70] Placer County Air Pollution Control District, *Chapter 2, "Thresholds of Significance*." In 2017 Air Quality Handbook. 2017. *https://www.placerair.org/DocumentCenter/View/2047/Chapter-2-Thresholds-of-Significance-PDF*

significance of construction-generated GHG emissions.[71] Additionally, other air districts, such as the South Coast Air Quality Management District, recommend amortizing construction emissions over a 30-year period and adding these emissions to total operational emissions.[72] This indicates that there is no consistent threshold uniformly applied across the State; therefore, depending on a project's location, the significance of construction-generated GHGs may be determined significant or less than significant depending on the threshold applied at the project level. Establishing a threshold of significance is also the discretion of a lead agency, which may develop an approach with substantial evidence.

Given that the potential compliance responses that would occur from implementation of the Proposed Amendments would occur statewide, no exact location of these compliance responses can be determined at this time. Also, in consideration of the multiple thresholds that could be applied for project-level analyses, CARB cannot assure the significance of a future project's construction emissions. Moreover, construction GHG emissions can be contextualized in consideration of long-term GHG emissions. For instance, in its 2022 Justification Report for its *2022 Air Quality Guide,* BAAQMD states that "greenhouse gas emissions from construction represent a very small portion of a project's lifetime GHG emissions" and therefore, as stated above, does not recommend a numerical or qualitative threshold for determining the significance of construction-generated GHG emissions.[73] BAAQMD, instead, uses a qualitative approach using project design features that inherently reduce operational GHG emissions, which is sufficient to offset the temporary GHG emissions emitted during a project's construction.

Similarly, as indicated in CARB's GHG analysis of the Proposed Amendments, while some small level of GHG emissions would be emitted from the reasonably foreseeable compliance responses to the Proposed Amendments, these emissions would be substantially less than the emissions benefits of implementation of the Proposed Amendments.[74]

---

[71] Bay Area Air Quality Management District, *Chapter 6, "Project-Level Climate Impacts*." In CEQA Air Quality Guidelines. 2022. *https://www.baaqmd.gov/~/media/files/planning-and-research/ceqa/ceqa-guidelines-2022/ceqa-guidelines-chapter-6-project-climate-impacts_final-pdf.pdf?la=en*

[72] South Coast Air Quality Management District*, Draft Guidance Document – Interim CEQA Greenhouse Gas Significance Threshold*. October 2008. *https://www.aqmd.gov/docs/default-source/ceqa/handbook/greenhouse-gases-(ghg)-ceqa-significance-thresholds/ghgattachmente.pdf*

[73] Bay Area Air Quality Management District, Appendix B, *CEQA Thresholds for Evaluating the Significance of Climate Impacts from Land Use Projects and Plans*. California Environmental Quality Act Air Quality Guidelines. April 2022. *https://www.baaqmd.gov/~/media/files/planning-and-research/ceqa/ceqa-guidelines-2022/appendix-b-thresholds-for-evaluating-significance-of-climate-impacts_final-pdf.pdf?la=en*

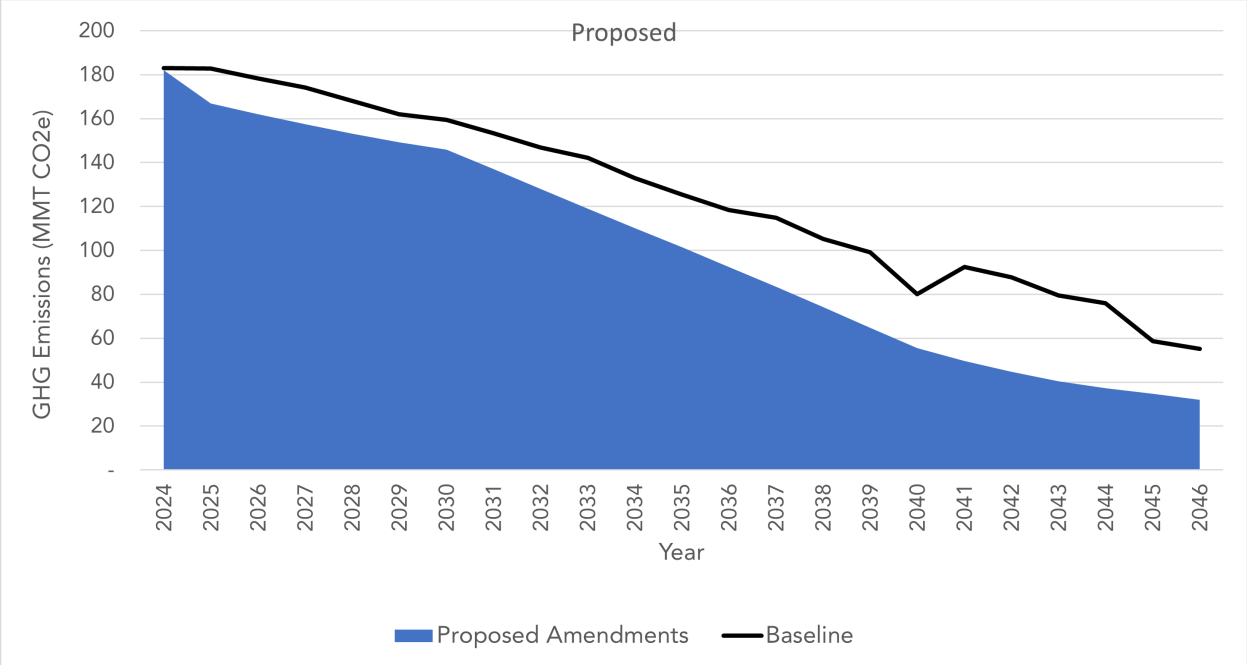
[74] For supporting data and analysis supporting CARB's calculations of GHG emission reductions, see the Greenhouse Gas Emissions Analysis Workbook for the 15-day Changes. August 12, 2024. https://ww2.arb.ca.gov/sites/default/files/2024-08/15Day%20GHG%20Calculations_posted_0.xlsx.

The Proposed Amendments include strengthening the CI reduction benchmarks through 2030 in support of achieving California's 2045 GHG reduction requirement enacted through SB 1279. The required reduction in the CI of the transportation fuel pool is expected to result in annual GHG emissions reductions as shown in Figure 7. The LCFS calculates emission reductions on a full life cycle basis for the fuel production, transport, and use; therefore, GHG emission reductions occur both in California and out-of-state. Staff calculated GHGs associated with each scenario.

Figure 7 summarizes the annual life cycle GHG emissions reductions under the business as usual (BAU) scenario and the proposed amendments scenario. Staff expects the proposed amendments to reduce GHG emissions relative to the BAU by 554 million metric tons in carbon dioxide equivalent ($MMTCO_2e$) from 2024 through 2046.[75] GHG reduction estimates are derived from the California Transportation Supply (CATS)[76] outputs of the fuel quantities and average annual CI associated with each fuel based on the Proposed Amendments, and expected GHG reductions associated with expected reductions in emissions from upstream oil and gas extraction that would be expected to result from corresponding petroleum fuel demand reductions. Staff used the same assumptions and framework for calculating upstream GHG emission reductions used to calculate upstream air quality reductions, but referenced 2019 oil and gas extraction GHG emissions from the Scoping Plan as the baseline value in the calculation.[77]

[75] For supporting data and analysis supporting CARB's calculations of GHG emission reductions, see the Greenhouse Gas Emissions Analysis Workbook for the 15-day Changes (Aug. 12, 2024). https://ww2.arb.ca.gov/sites/default/files/2024-08/15Day%20GHG%20Calculations_posted_0.xlsx.
[76] For more information and context on the CATS model, please see Attachment C: LCFS Fuels and Credit Market Modeling for the 15-day Changes. https://ww2.arb.ca.gov/sites/default/files/barcu/regact/2024/lcfs2024/15day_attc.pdf
[77] See California Air Resources Board, *Appendix C-1: Standardized Regulatory Impact Assessment (SRIA).* September 9, 2023. https://ww2.arb.ca.gov/sites/default/files/barcu/regact/2024/lcfs2024/appc-1.pdf for further information on the upstream oil emission reduction methodology.

Figure 7: Annual GHG Emissions of Business as Usual and Proposed Amendments[78]



The comparatively small level of GHG emissions related to construction and operation of facilities associated with the compliance responses, as described above, would be offset by the reductions in GHG emissions from the implementation of the Proposed Amendments. As a result, implementation of the proposed strategy would result in a **beneficial** impact on GHG emissions.

9. Hazards and Hazardous Materials

Impact 9-1: Short-Term Construction-Related Impacts Related to Hazards and Hazardous Materials

Reasonably foreseeable compliance responses associated with the Proposed Amendments include the following responses, which could result in changes to the existing physical environment: modifications to cultivation volume and transport of feedstock; changes to location and types of feedstock; new or modified processing facilities for feedstock and finished fuel production; increased transportation of finished alternative fuels to blending terminals or retail fuel sites; construction and operation of new facilities to produce renewable diesel, renewable gasoline, AJF, and renewable

[78] California Air Resources Board. *Greenhouse Gas Emissions Analysis Workbook for 15-Day Changes*. August 12, 2024. https://ww2.arb.ca.gov/sites/default/files/2024-08/15Day%20GHG%20Calculations_posted_0.xlsx.

propane; construction of biomass gasification and pyrolysis systems for hydrogen and renewable natural gas production; construction of new anaerobic facilities to digest manure from dairies, sewage from wastewater treatment plants, and organic waste diverted from landfills; construction of infrastructure to collect biogas and produce methane; construction of stand-alone and bolt-on cellulosic processing units for renewable fuels production; increase in collection of yard waste or removal of forest litter and agricultural residues; construction of electrolysis units and substitution of renewable natural gas for fossil gas in production of hydrogen; construction of solar and wind electricity generation projects; modification to existing or new industrial facilities to capture CO_2 emissions; construction of new infrastructure such as pipelines, wells and other surface facilities; construction and operation of additional refueling hydrogen stations and EV charging stations; modifications to electricity distribution and transmission infrastructure; modifications to existing crude production facilities to accommodate solar and wind electricity, solar heat, and/or solar steam generation; electrification of equipment and installation of renewable electricity and battery storage systems at petroleum refineries and alternative fuel production facilities; expansion of public transit systems; and land use changes and changes to fuel-associated shipment patterns.

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 of, and such spills are typically minor and localized to the Immediate area of the fueling (or maintenance), the potential remains for a significant 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.

Therefore, short-term construction-related impacts associated with the Proposed Amendments on hazards and hazardous materials would be significant.

Potential hazard resource impacts could be reduced to a less-than-significant level by mitigation measures prescribed by local, state, federal, or other land use or permitting agencies (either in the U.S. or abroad) with approval authority over the particular development projects. However, because CARB has no land use authority, mitigation is not within its purview to reduce significant impacts to less-than-significant levels.

Mitigation Measure 9-1

The Regulatory Setting in Attachment A includes, but is not limited to, applicable laws, regulations, and policies related to hazards and hazardous materials. CARB 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 discretionary local land use and/or permitting authority. New or modified facilities in California could qualify as a "project" under CEQA. The jurisdiction with primary permitting 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 may be identified during the environmental review by agencies with discretionary project approval authority. The following recognized practices are routinely required to avoid upset and accident-related impacts:

- Proponents of new or modified facilities constructed as a compliance response to the Proposed Amendment would coordinate with local land use agencies to seek entitlements for development, including the completion of all necessary environmental review requirements (e.g., CEQA). The local land use agency or governing body would certify that the environmental document was prepared in compliance with applicable regulations and would approve the project for development.
- Based on the results of the environmental review, proponents would implement all mitigation identified in the environmental document to reduce or substantially lessen the environmental impacts of the project. The definition of 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 shall be performed by or 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 shall 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 shall be in areas away from sensitive receptors such as schools or residential areas. These areas shall 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 encounter potentially hazardous materials/wastes shall 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 land use and/or permitting agencies for individual projects, and the programmatic level of analysis associated with this ~~Draft~~ Final EIA 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 significant impacts. Although unlikely after implementation of Mitigation Measure 9-1, it is possible that significant impacts related to hazards and hazardous materials could still occur.

Consequently, while impacts could likely be reduced to a less-than-significant level with mitigation measures imposed by the land use and/or permitting agencies acting as lead agencies for these individual projects under CEQA, if and when a project proponent seeks a permit for compliance-response related project, this ~~Draft~~ Final EIA takes the conservative approach in its post-mitigation significance conclusion and discloses, for CEQA compliance purposes, that the potential short-term construction-related impacts regarding hazards and hazardous materials associated with the Proposed Amendments would remain **significant and unavoidable**.

Impact 9-2: Long-Term Operational Impacts Related to Transport, Use, and Disposal of Hazards and Hazardous Materials

Reasonably foreseeable compliance responses associated with the Proposed Amendments include the following responses, which could result in changes to the existing physical environment: modifications to cultivation volume and transport of feedstock; changes to location and types of feedstock; new or modified processing facilities for feedstock and finished fuel production; increased transportation of finished alternative fuels to blending terminals or retail fuel sites; construction and operation of new facilities to produce renewable diesel, renewable gasoline, AJF, and renewable propane; construction of biomass gasification and pyrolysis systems for hydrogen and renewable natural gas production; construction of new anaerobic facilities to digest manure from dairies, sewage from wastewater treatment plants, and organic waste diverted from landfills; construction of infrastructure to collect biogas and produce methane; construction of stand-alone and bolt-on cellulosic processing units for renewable fuels production; increase in collection of yard waste or removal of forest litter and agricultural residues; construction of electrolysis units and substitution of renewable natural gas for fossil gas in production of hydrogen; construction of solar and wind electricity generation projects; modification to existing or new industrial facilities to capture CO_2 emissions; construction of new infrastructure such as pipelines, wells and other surface facilities; construction and operation of additional refueling hydrogen stations and EV charging stations; modifications to electricity distribution and transmission infrastructure; modifications to existing crude production facilities to accommodate solar and wind electricity, solar heat, and/or solar steam generation; electrification of equipment and installation of renewable electricity and battery storage systems at petroleum refineries and alternative fuel production facilities; expansion of public transit systems; and land use changes and changes to fuel-associated shipment patterns.

Harmful substances can enter the environment in a number of ways throughout the entire cycle of fuel production, manufacturing, transportation, storage, distribution, usage, and disposal. All internal combustion engine vehicles have the potential to release chemicals into the environment. Most commonly, these substances are expelled from 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 also contaminate groundwater. Substances in airborne engine exhaust settle directly onto water, soil, and vegetation, or be washed down onto these surfaces when it rains. Implementation of the Proposed Amendments could reduce the impacts of these hazardous substances as alternative fuel use increases.

The operation of new and modified carbon capture and sequestration (CCS) facilities could result in the transport, use, and/or disposal of new or higher levels of hazardous chemicals compared to the baseline, depending on the type of facility and carbon capture system present. In the near term, most potential CCS projects would likely occur in processes at existing facilities that already produce high-purity CO2 streams, such as ethanol production and certain forms of steam methane reforming. These projects do not require a CO2 capture step and are expected to occur sooner because of their lower cost. Therefore, these near-term projects are likely to incur minimal changes in criteria and toxics emissions as a result of CO2 compression, transport, and injection. For CCS projects that produce low-purity CO2 streams, such as power plants, the CO2 capture technology would likely be primarily based on chemical adsorption using amine-based solvents, such as monoethanolamine (MEA).[79] Because amine-based solvents in carbon capture systems would be recycled in a closed system, emissions of amine-based solvents associated with carbon capture systems would be minimal. CO2 capture technology that involves the use of amine solvents would produce amine waste related to amine degeneration. The waste amine requires further treatment and disposal. Thus, if an accident were to occur during treatment or disposal, hazardous consequences could result.

Geologic sequestration involves the injection of CO_2 thousands of feet underground, where it is trapped within the pore spaces of solid rock. EPA requires that sequestration sites have confining subsurface zones, or layers of impermeable rock, to keep CO_2 from escaping into overlying geologic layers, groundwater, or the surface (40 CFR 146.83(a)(2)). Under the geologic sequestration rule, EPA requires that potential geologic sequestration sites be thoroughly studied to protect the safety and security of the project. Geologic sequestration is not allowed where unsuitable subsurface

[79] Capture technologies such as pre-combustion capture, processes that use other solvents or sorbents, or entirely new power cycles may have different emissions impacts but have not yet been demonstrated commercially.

conditions exist, and all underground injection projects must obtain permits to ensure the protection of underground drinking water sources or the surface (40 CFR 146.82(a)(3)).

Implementation of the Proposed Amendments could also increase the production of biofuels. Biofuel processing plants use various hazardous materials to create finished products. Each plant is responsible for determining if each waste stream is hazardous and managing it appropriately. Hazardous materials typically used at biofuel processing plants include the following.

a) Spent Filter Media

Spent filter media such as diatomaceous earth, filter aid, and socks can be ignitable. Spent filter media with high moisture content (from oil or biodiesel) can spontaneously combust. It is the responsibility of the facility to operate its plant in a manner that would not generate ignitable waste filter media. If the material is hazardous, the facility may manage the ignitable waste as a useful product and avoid Resource Conservation and Recovery Act (RCRA) regulation. Using the waste as a fuel is not a legitimate use under the regulations, unless the fuel is an actual product that results from the process. The facility may also dispose of the ignitable filter media as a hazardous waste at a permitted treatment, storage, or disposal facility. If the waste filter media is not hazardous, the facility may manage it as a solid waste.

b) Waste Glycerin

Waste glycerin can be ignitable or corrosive, or both. In addition, glycerin has a very high biochemical oxygen demand. While this does not make it a hazardous waste, it does present a threat to streams and lakes if disposed upon the land. This could also disrupt wastewater treatment systems' biological process into which the waste glycerin is disposed.

c) Spent or Unused Catalyst

Catalysts (and catalyst neutralizers) used in biodiesel production are acidic or caustic, thus the waste is potentially corrosive. Any spent catalyst (or other waste material) with a pH greater than or equal to 12.5, or less than or equal to 2, is a hazardous waste. Like waste methanol, waste catalyst is not subject to RCRA if it is returned to the process in a closed-loop system, but it would be a hazardous waste outside a closed-loop system until it was returned to the process.

d) Wastewater

Wastewater disposed under the authority of a valid CWA permit is not regulated under RCRA. However, if wastewater contains a listed hazardous waste or exhibits a hazardous characteristic, it must be managed as a hazardous waste until treated or disposed in the CWA-permitted process. Biodiesel wastewater could be hazardous if it

has high or low pH from catalyst disposed in the wastewater, contains high concentrations of methanol that would make it ignitable, or contains other listed or characteristic wastes.

e) Spent or Unwanted Laboratory Chemicals

A variety of chemicals are used in laboratories. If these chemicals are listed as a hazardous waste or fail the Toxicity Characteristic Leaching Procedure toxicity levels at 40 Code of Federal Regulations (CFR) Section 261.24, they are a hazardous waste when disposed. Some unused chemicals destined for disposal may be listed under 40 CFR Section 261.33 and considered "acute hazardous wastes." When calculating monthly waste generation rates, one kilogram of P-listed wastes generated during a month would make the facility a large quantity generator and subject to permitting as discussed in Attachment A.

Additive chemicals would need to be introduced into biodiesel blends to control oxidation, corrosion, foaming, cold temperature flow properties, biodegradation, water separation, and NO_X formation. There are several classes of additives, and some perform multiple functions when blended in fuel. The broad classes of additives include the following:

- Foam inhibitor: This additive is generally a silicone-based compound that is essentially insoluble in fuel and affects bubble rupture (foam bubble destruction) in the fuel.
- Antioxidant: These chemical compounds, which are either phenolic or aminic based, prevent peroxide formation in fuel during long-term or high-temperature storage.
- Lubricity improver: This polar compound, which is generally derived from fatty acids, provides protection against metal-to-metal wear within a fuel system. Additives in this class can be esters, fatty acids, or amines for the most part.
- Corrosion inhibitor: This additive prevents corrosion of fuel system components—mainly exposed reactive metal surfaces, such as non-coated steel.
- Deposit control additive: This additive is either a detergent or a dispersant additive that helps remove deposits that may form during high temperature exposure of fuel to the fuel system. These deposits generally form on or near the injector tip or spray holes.
- Conductivity improver: Fuels that are hydroprocessed generally do not contain components that conduct static charge from the bulk fuel to the walls of storage tanks. Accumulated charge can cause static discharge and either damage equipment or cause fires.

- Water separation additive: This additive promotes separation of water from fuel.
- Low-temperature flow improver: This additive improves low-temperature performance of fuel by modifying wax crystal structure of waxy components of fuel.
- Cetane improver (i.e., di-tert butyl peroxide): This additive raises cetane of fuel by modifying ignition properties of fuel.
- Biocide: This additive inhibits biological growth in fuel that is exposed to water.
- Additives would be needed for formulating diesel fuels to meet fit-for-purpose requirements. In addition to the provisions of providing energy for operating an engine, a fuel must also:
- not foam when fueling;
- not spark and/or cause fires or explosions when fueling;
- be stable for long-term storage;
- not form deposits in the fuel injection system;
- provide lubricity to moving parts within the fuel system; and
- not form deposits in the injection components, including the inside and outside of the fuel injector.

Ethanol is a volatile, flammable, colorless liquid and has a strong characteristic odor. It is easily ignited by heat, sparks, or flames. Thus, if an accident were to occur during transport, hazardous consequences could result. While ethanol is currently transported for use in fuels, implementation of the Proposed Amendments could alter the transportation patterns, reflecting different quantities or locations of sources.

Pyrolysis oil is a fuel intermediate produced by fast pyrolysis or co-processing of cellulosic biomass, which has high acidity, viscosity, and corrosivity. Thus, if an accident were to occur during transport, blending, and/or upgrading, hazardous consequences could result.

Transport of hazardous materials, including gasoline, diesel, hydrogen, and biofuels is regulated under the U.S. Department of Transportation (U.S. DOT), which requires the safe and reliable transportation of hazardous materials by all modes. U.S. DOT's Hazardous Materials Regulations govern the transportation of ethanol and other biofuels and blends by rail, air, motor carrier, and barge. In addition, 49 CFR part 172 lists and classifies those materials which the U.S. DOT has designated as hazardous materials for purposes of transportation and prescribes the requirements for shipping papers, package marking, labeling, placarding, emergency response, training, and safety and applicable to the shipment and transportation of those hazardous materials.

Requirements for carriage by rail, including operating, loading, and unloading requirements, along with detailed requirements for Class 3 (flammable liquid) materials are provided in 49 CFR Part 174.

Thus, regardless of the location of origin, transportation route, or end use, hazardous materials related to the Proposed Amendments are regulated through various programs, as described above.

However, operation of CCS facilities could result in the transport, use, and/or disposal of new or higher levels of hazardous chemicals compared to the baseline, depending on the type of facility and carbon capture system present. Therefore, long-term operational-related impacts associated with the Proposed Amendments on hazards and hazardous materials would be significant.

Potential hazard resource impacts could be reduced to a less than significant level by mitigation measures prescribed by local, state, federal, or other land use or permitting agencies (either in the U.S. or abroad) with approval authority over the particular development projects. However, because CARB has no land use authority, mitigation is not within its purview to reduce significant impacts to less than significant levels.

Mitigation Measure 9-2

The Regulatory Setting in Attachment A includes applicable laws and regulations in regard to hazards and hazardous materials. CARB 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.

Permits and/or agreements to reduce potential hazards and hazardous materials impacts could include, but are not limited to, UIC permits administered pursuant to the Safe Drinking Water Act at the federal and State levels. EPA issues Class VI permits under these regulations, which apply to injections wells that are drilled for the sole purpose of CO_2 injection in an underground formation as part of a CCS project, without any other intended purpose. CalGEM issues Class II permits under regulatory authority granted by EPA pursuant to UIC regulations. Class II permits apply to injection wells constructed for the purpose of injecting fluids produced during oil and gas production, such as brines, and include injection wells used in tertiary or EOR methods that could also be used for the purpose of CO_2 sequestration as part of a CCS project.

To obtain these permits, the project proponent would be required to conduct various evaluations, such as engineering and geologic studies, and submit proposed injection well construction and operation plans. Requirements for these permits are likely to include isopach maps, cross sections, and representative well logs that identify all

geologic units, freshwater aquifers, and oil or gas zones. In addition, CEQA and/or other necessary regulatory processes would be completed to address and mitigate potential environmental effects. Because these actions would address inspection, enforcement, mechanical integrity testing, plugging and abandonment oversight, data management, public outreach, and potential environment effects, this impact could be reduced.

Pipeline operators will follow PHMSA recommendations included in 98 FR 33576:

- Identify areas surrounding the pipeline that may be prone to large earth movement, including but not limited to slope instability, subsidence, frost heave, soil settlement, erosion, earthquakes, and other dynamic geologic conditions that may pose a safety risk.
- Use geotechnical engineers during the design, construction, and ongoing operation of a pipeline system to ensure that sufficient information is available to avoid or minimize the impact of earth movement on the integrity of the pipeline system. At a minimum, operators should consider soil strength characteristics, ground and surface water conditions, propensity for erosion or scour of underlying soils, and the propensity of earthquakes or frost heave.
- Develop design, construction, and monitoring plans and procedures for each identified location, based on the site-specific hazards identified. When constructing new pipelines, develop and implement procedures for pipe and girth weld designs to increase their effectiveness for taking loads, either stresses or strains, exerted from pipe movement in areas where geological subsurface conditions and movement are a hazard to pipeline integrity.
- Monitoring plans shall include provisions related to the following:
    - Ensuring during construction of new pipelines that excavators do not steepen, load (including changing the groundwater levels) or undercut slopes which may cause excessive ground movement during construction or after operations commence.
    - Conducting periodic visits and site inspections. Increased patrolling may be necessary due to potential hazards identified and existing/pending weather conditions. Right-of-way patrol staff must be trained on how to detect and report conditions that may lead to or exhibit ground movement to appropriate staff.
    - Identifying geodetic monitoring points (*i.e.,* survey benchmarks) to track potential ground movement.
    - Installing slope inclinometers to track ground movement at depth which may otherwise not be detectable during right-of-way patrols.

- Installing standpipe piezometers to track changes in groundwater conditions that may affect slope stability.
- Evaluating the accumulation of strain on the pipeline by installing strain gauges.
- Conducting stress/strain analysis utilizing in-line inspection tools equipped with inertia mapping unit technology and high resolution deformation in-line inspection for pipe bending and denting from movement.
- Utilizing aerial mapping light detection and ranging or other technology to track changes in ground conditions.

- Monitor environmental conditions and changing weather patterns in proximity to their facilities and evaluate soil stability that may have been adversely impacted.).
- Use available data and information resources to assess pipeline facility vulnerability relative to landslides and other types of earth movement.
- Consider the findings and recommendations of pertinent research projects, studies, and reports on the impact of changing weather patterns on soil stability. PHMSA also notes that industry and academic materials could be informative regarding relevant considerations and strategies for ensuring pipeline integrity in areas of land movement or soil subsidence.
- Site-specific measures to reduce potential hazardous conditions may include:
  - Re-routing the pipeline right-of-way prior to construction to avoid areas prone to large ground movement such as unstable slope areas, earthquake fault zones, permafrost movement, or scour.
  - Utilize properly designed horizontal directional drilling to go below areas of potential land movement.
  - Installation of drainage measures in the trench to mitigate subsurface flows and enhance surface water draining at the site including streams, creeks, runs, gullies, or other sources of surface run-off that may be contributing surface water to the site or changing groundwater levels that may exacerbate earth movement.
  - Reducing the steepness of potentially unstable slopes, including installing retaining walls, soldier piles, sheet piles, wire mesh systems, mechanically stabilized earth systems and other mechanical structures.
  - Installing trench breakers and slope breakers to mitigate trench seepage and divert trench flows along the surface to safe discharge points off the site or right-of-way.

- Building retaining walls and/or installing steel piling or concrete caissons to stabilize steep slope areas as long as the corrosion control systems are not compromised.

- Reducing the loading on the site by removing and/or reducing the excess backfill materials to off-site locations. Soil placement should be carefully planned to avoid triggering earth movement in other locations.

- Compacting backfill materials at the site to increase strength, reduce water infiltration, and achieve optimal moisture content.

- Drying the soil using special additives such as lime-kiln dust or cement-kiln to allow the materials to be re-used and worked at the site. Over-saturated materials may require an extensive amount of time and space to dry.

- Regrading the pipeline right-of-way to minimize scour and erosion.

- Bringing the pipeline above ground and placing it on supports that can accommodate large ground movements (e.g., transitions across earthquake fault zones or unstable slopes, without putting excessive stress or strain on the pipeline).

- Reducing the operating pressure temporarily or shutting-in the affected pipeline segment completely.

- Re-routing the pipeline when other appropriate mitigation measures cannot be effectively implemented to maintain safety.

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 EIA 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 significant impacts. Although unlikely after implementation of Mitigation Measure 9-2, it is possible that significant impacts related to hazards and hazardous materials could still occur.

Consequently, while impacts could likely be reduced to a less-than-significant level with mitigation measures imposed by the land use and/or permitting agencies acting as lead agencies for these individual projects under CEQA, if and when a project proponent seeks a permit for compliance-response related project, this ~~Draft~~ Final EIA takes the conservative approach in its post-mitigation significance conclusion and discloses, for CEQA compliance purposes, that the potential long-term operational-related impacts regarding hazards and hazardous materials associated with the Proposed Amendments would remain **significant and unavoidable**.

10. Hydrology and Water Quality

Impact 10-1: Short-Term Construction-Related Impacts to Hydrology and Water Quality

Reasonably foreseeable compliance responses associated with the Proposed Amendments include the following responses, which could result in changes to the existing physical environment: modifications to cultivation volume and transport of feedstock; changes to location and types of feedstock; new or modified processing facilities for feedstock and finished fuel production; increased transportation of finished alternative fuels to blending terminals or retail fuel sites; construction and operation of new facilities to produce renewable diesel, renewable gasoline, AJF, and renewable propane; construction of biomass gasification and pyrolysis systems for hydrogen and renewable natural gas production; construction of new anaerobic facilities to digest manure from dairies, sewage from wastewater treatment plants, and organic waste diverted from landfills; construction of infrastructure to collect biogas and produce methane; construction of stand-alone and bolt-on cellulosic processing units for renewable fuels production; increase in collection of yard waste or removal of forest litter and agricultural residues; construction of electrolysis units and substitution of renewable natural gas for fossil gas in production of hydrogen; construction of solar and wind electricity generation projects; modification to existing or new industrial facilities to capture CO_2 emissions; construction of new infrastructure such as pipelines, wells and other surface facilities; construction and operation of additional refueling hydrogen stations and EV charging stations; modifications to electricity distribution and transmission infrastructure; modifications to existing crude production facilities to accommodate solar and wind electricity, solar heat, and/or solar steam generation; electrification of equipment and installation of renewable electricity and battery storage systems at petroleum refineries and alternative fuel production facilities; expansion of public transit systems; and land use changes and changes to fuel-associated shipment patterns.

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., National Pollutant Discharge Elimination System permit, Stormwater Pollution Prevention Plan). 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.

Short-term construction-related impacts to hydrologic resources associated with the Proposed Amendments would be significant.

Potential hydrologic resource impacts could be reduced to a less-than-significant level by mitigation measures prescribed by local, state, federal, or other land use or

permitting agencies (either in the U.S. or abroad) with approval authority over the particular development projects. However, because CARB has no land use authority, mitigation is not within its purview to reduce significant impacts to less-than-significant levels.

Mitigation Measure 10-1

The Regulatory Setting in Attachment A includes applicable laws and regulations regarding hydrology and water quality. CARB 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 measures would be identified during the environmental review by agencies with project-approval authority. The following recognized practices are routinely required to avoid and/or mitigate hydrology and water quality-related impacts:

- Proponents of new or modified facilities constructed because of reasonably foreseeable compliance responses to new regulations 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 would certify that the environmental document was prepared in compliance with applicable regulations and would approve the project for development.
- Based on the results of the environmental review, proponents shall implement all feasible mitigation identified in the environmental document to reduce or substantially lessen the potentially significant impacts of a project. The definition of 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. Project proponents shall implement the following measures as applicable:
    - Implement Best Management Practices to reduce sedimentation and pollution of surface waters, such as installation of silt fencing around the perimeter of active construction areas, sediment traps, revegetation, and rock and gravel cover.
    - Train construction workers for proper response to hazardous materials spills as well as responsibilities for maintaining best management practices (BMPs) on site.

- Design drainage plans for runoff to contain adequate capacity for projected flows on site.
- Avoid filling of waters of the United States and waters of the State to the extent feasible. If activities require a waste discharge requirement or Section 401 Water Quality Certification, comply with all avoidance, reduction, and compensatory measures.

- Under the oversight of the local lead agency, prior to issuance of any construction permits, the proponents for the proposed project shall prepare a stormwater drainage and flood control analysis and management plan. The plans will be prepared by a qualified professional and will summarize existing conditions and the effects of project improvements, and will include all appropriate calculations, a watershed map, changes in downstream flows and flood elevations, proposed on- and off-site improvements, features to protection downstream uses, and property and drainage easements to accommodate downstream flows from the site. Project drainage features will be designed to protect existing downstream flow conditions that will result in new or increased severity of off-site flooding.
- Project proponents shall 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) implementing stormwater quality controls, such as infiltration, detention/retention, and/or biofilters, as well as basins, swales, and pipes in the system design.
- The project proponent shall design and construct new facilities to provide appropriate flood protection such that operations are not adversely affected by flooding and inundation. These designs will be approved by the local or state land use agency. The project proponent will also consult with the appropriate flood control authority on the design of off-site 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 off-site 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 land use and/or permitting agencies for individual projects, and the programmatic level of analysis associated with this ~~Draft~~ Final EIA 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 significant impacts. Although unlikely after implementation of Mitigation Measure 10-1, it is possible that significant impacts on hydrology and water quality could still occur.

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 EIA takes the conservative approach in its post-mitigation significance conclusion and discloses, for CEQA compliance purposes, that short-term construction-related effects to hydrology and water quality associated with the Proposed Amendments would remain **significant and unavoidable**.

Impact 10-2: Long-Term Operational-Related Impacts to Hydrology and Water Quality

Reasonably foreseeable compliance responses associated with the Proposed Amendments include the following responses, which could result in changes to the existing physical environment: modifications to cultivation volume and transport of feedstock; changes to location and types of feedstock; new or modified processing facilities for feedstock and finished fuel production; increased transportation of finished alternative fuels to blending terminals or retail fuel sites; construction and operation of new facilities to produce renewable diesel, renewable gasoline, AJF, and renewable propane; construction of biomass gasification and pyrolysis systems for hydrogen and renewable natural gas production; construction of new anaerobic facilities to digest manure from dairies, sewage from wastewater treatment plants, and organic waste diverted from landfills; construction of infrastructure to collect biogas and produce methane; construction of stand-alone and bolt-on cellulosic processing units for renewable fuels production; increase in collection of yard waste or removal of forest litter and agricultural residues; construction of electrolysis units and substitution of renewable natural gas for fossil gas in production of hydrogen; construction of solar and wind electricity generation projects; modification to existing or new industrial facilities to capture CO_2 emissions; construction of new infrastructure such as pipelines, wells and other surface facilities; construction and operation of additional refueling hydrogen stations and EV charging stations; modifications to electricity distribution and transmission infrastructure; modifications to existing crude production facilities to accommodate solar and wind electricity, solar heat, and/or solar steam generation; electrification of equipment and installation of renewable electricity and battery storage systems at petroleum refineries and alternative fuel production facilities; expansion of

public transit systems; and land use changes and changes to fuel-associated shipment patterns.

As discussed in Chapter 2, waste-based feedstocks, like used cooking oil (UCO) and animal fat, do not have additional LUC scores that are added to their CI value and made up 84% of all biomass-based diesel in the program from 2011 through 2022. The LUC scores for crop-based fuels add 12-70 grams per megajoule (g/MJ) to the pathway's CI score, making the CI of crop-based fuels higher relative to waste-based feedstocks. As the CI benchmark becomes more stringent each year, the program incentive for crop-based feedstocks declines, and pathways using these feedstocks will eventually become deficit-generating. The proposed crop-based biofuels sustainability criteria would additionally help protect against potential future land use impacts and impacts on hydrology and water quality from crops grown for biofuel feedstocks. However, increasing demand for biofuel crops could still potentially displace production of food crops, resulting in conversion of both fallow and cultivated lands to biofuel feedstock crop production and increasing demands on water resources. Changes in land use associated with biofuel feedstock production are likely to change water demand to support new crop types, depending on the size of the affected area, location, and existing uses. This could result in an increase or decrease in water demand and would be subject to availability and regulatory requirements. Shifting cultivation of fuel-based agriculture could displace land currently used for row crops, orchards, and grazing. Planting crops used to produce biofuels and short rotation forestry on marginal land could have long-term effects on hydrology. The U.S. has more than 890 million acres of farmland that produce an abundant supply of food and other products.[80] American agriculture is noted worldwide for its high productivity, quality, and efficiency in delivering goods to the consumer. However, if improperly managed, activities from working farms and ranches can affect water quality. Agricultural nonpoint source pollution affects water quality of rivers and lakes, wetlands, and contributes to contamination of estuaries and ground water. Agricultural activities that cause nonpoint source pollution include poorly located or managed animal feeding operations; overgrazing; plowing too often or at the wrong time; and improper, excessive, or poorly timed application of pesticides, irrigation water, and fertilizer.

Pollutants that result from farming and ranching include 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 addition, as described above under *"Impact 4-2: Long-Term*

[80] U.S. Department of Agriculture, *Farms and Land in Farms 2022 Summary*. National Agricultural Statistics Service. February 2023. *https://downloads.usda.library.cornell.edu/usda-esmis/files/5712m6524/bk129p580/2z10z2698/fnlo0223.pdf#:~:text=In%202022%2C%2050.8%20percent%20of%20all%20farms%20had,at%20893%2C400%2C000%20acres%2C%20decreased%201%2C900%2C000%20acres%20from%202021*

Operation-Related Effects on Biological Resources," GTAP analysis includes indirect effects of increased pesticide and nutrient use.

In general, farmers may employ best management practices (BMPs) to reduce runoff associated with agricultural practices. BMPs vary from state to state and among countries 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 (e.g., the willingness of a farmer to implement the practice in a voluntary program), cost, and cost-effectiveness. Regardless, implementation of the Proposed Amendments could result in adverse effects on water quality.

An increased use of anaerobic digesters (i.e., dairy digesters, wastewater treatment plants, organic waste digesters) could result in the contamination of local waterways and groundwater resources. If properly managed in accordance with an established nutrient management plan and within the applicable water quality and waste discharge requirements, anaerobic digestors can improve water quality due to improved wastewater management. Digester systems can also facilitate improved nutrient management using appropriate solid liquid and nutrient separation technology coupled consistent with the nutrient management plan or through off site export.[81,82] If improperly managed, constituents and/or byproducts of anaerobic digestion could pollute water quality by contributing excess nutrients, bacterial pathogens, and oxygen-demanding materials. Application of improperly treated digestate and/or improper application timing or rates of digestate to agricultural land may lead to increased nitrogen oxide emissions, soil contamination, and/or nutrient leaching. However, WDRs are required for each facility to address surface water discharges of digestate or manure constituents. In addition, regulations prohibit surface water discharges (unless covered by an NPDES permit) and require appropriate setbacks for facilities from surface water bodies, lined detention ponds, application of digestate at agronomic rates to surrounding lands, and implementation of a groundwater monitoring system to detect when leaks occur.

Steam power generation facilities, including steam methane reforming to produce hydrogen, have the potential to result in long-term operational waste discharges associated with the steam condensation and cooling operations. In arid environments of southern California, where many of the anticipated future renewable energy facilities

---

[81] California Regional Water Quality Control Board (Region 5), *Waste Discharge Requirements General Order No. R5-2010-0130 Dairies With Anaerobic Digester or Co-Digester Facilities*. December 10, 2010. *https://www.waterboards.ca.gov/centralvalley/board_decisions/adopted_orders/general_orders/r5-2010-0130_wdr_go.pdf*

[82] United States Environmental Protection Agency, *AgSTAR Project Development Handbook*. EPA 430-B-20-001. April 2020. *https://www.epa.gov/sites/default/files/2014-12/documents/agstar-handbook.pdf*

might be located and where available surface water and groundwater resources are limited, cooling operations that use water generally result in the creation of highly saline blowdown water, or brine. Brine wastes must be stored in lined containment ponds to prevent leakage and contamination of underlying groundwater. Typical operations would require multiple brine waste evaporation ponds, and dried brine wastes would be periodically collected and hauled to landfills for disposal. Therefore, managed brine waste storage in the arid desert regions is not anticipated to result in discharges of concern to water bodies. While it is unlikely, because of limited water availability, that renewable energy facilities would occur in desert regions, the potential exists for such facilities to be constructed adjacent to streams and involve the use of river water for cooling operations. Natural waterways may also be used as a receiving water for cooling water derived from a different source water. Conventional once-through cooling also may be more commonly used in less arid environments or coastal settings where a reliable and plentiful water source is available. Cooling water discharged to streams has the potential to cause temperature increases in the receiving water of sufficient magnitude that may exceed the thermal tolerance of aquatic life residing in the stream near the return flow, thus resulting in detrimental effects.

Long-term operational impacts on hydrologic resources associated with mechanical carbon dioxide removal and carbon capture and sequestration (CCS) projects would be potentially significant. CCS actions could result in minor to moderate seismic events, which could cause several centimeters of shift within a fault line. While these events could not be substantial such that damage to humans or structures would occur, brine displacement could result through the formation of leaks within geologic formations. This could result in contamination of groundwater resources; however, reservoirs are often selected that exist below the groundwater tables so as to avoid contamination of these resources in the case of leakage.[83] Additionally, use of CCS could place additional demand on water resources depending on the CCS technology and approach deployed, which could present additional water challenges for the state. Given the state's uncertain future regarding water security, water used for CO_2 capture and sequestering activities could result in further depleting water resources during periods of drought. However, the use of fresh water can be reduced through the use of project-site and technology specific approaches identified as part of project design, project level planning, and project environmental review.

Direct air capture projects could also have potentially significant impacts on hydrologic resources depending on the type, size, and location of these facilities. There could be adverse effects on drainage patterns that could present issues related to erosion or contaminated runoff. Further, depending on the conditions surrounding a facility and particular design on a direct air capture site, fans may erode natural landscapes

[83] Newmark, R. L., S. J. Friedmann, & Carroll, S.A., *Water Challenges for Geologic Carbon Capture and Sequestration*. Environmental Management 45:651–661. February 3, 2010. *https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2854354/pdf/267_2010_Articl e_9434.pdf*

(particularly sandy or very dry areas). In addition, because of the potential size of a direct air capture facility, groundwater recharge may be affected. Depending on the type of capture technology utilized at direct air capture facilities, groundwater resources could also be reduced because of the water demands related to some types of direct air capture facilities.

Consequently, long-term operation-related impacts to hydrologic resources would be significant.

Potential hydrologic resource impacts could be reduced to a less-than-significant level by mitigation measures prescribed by local, state, federal, or other land use or permitting agencies (either in the U.S. or abroad) with approval authority over the particular development projects. However, because CARB has no land use authority, mitigation is not within its purview to reduce significant impacts to less-than-significant levels.

Mitigation Measure 10-2: Implement Mitigation Measure 10-1

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 EIA 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 significant impacts. Although unlikely after implementation of Mitigation Measure 10-1, it is possible that significant impacts on hydrology and water quality could still occur.

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 EIA takes the conservative approach in its post-mitigation significance conclusion and discloses, for CEQA compliance purposes, that long-term operational-related impacts to hydrology and water quality under the Proposed Amendments would remain **significant and unavoidable**.

11. Land Use and Planning

Impact 11-1: Short-Term Construction-Related and Long-Term Operation-Related Impacts to Land Use

Reasonably foreseeable compliance responses associated with the Proposed Amendments include the following responses, which could result in changes to the existing physical environment: modifications to cultivation volume and transport of feedstock; changes to location and types of feedstock; new or modified processing facilities for feedstock and finished fuel production; increased transportation of finished alternative fuels to blending terminals or retail fuel sites; construction and operation of new facilities to produce renewable diesel, renewable gasoline, AJF, and renewable propane; construction of biomass gasification and pyrolysis systems for hydrogen and

renewable natural gas production; construction of new anaerobic facilities to digest manure from dairies, sewage from wastewater treatment plants, and organic waste diverted from landfills; construction of infrastructure to collect biogas and produce methane; construction of stand-alone and bolt-on cellulosic processing units for renewable fuels production; increase in collection of yard waste or removal of forest litter and agricultural residues; construction of electrolysis units and substitution of renewable natural gas for fossil gas in production of hydrogen; construction of solar and wind electricity generation projects; modification to existing or new industrial facilities to capture CO_2 emissions; construction of new infrastructure such as pipelines, wells and other surface facilities; construction and operation of additional refueling hydrogen stations and EV charging stations; modifications to electricity distribution and transmission infrastructure; modifications to existing crude production facilities to accommodate solar and wind electricity, solar heat, and/or solar steam generation; electrification of equipment and installation of renewable electricity and battery storage systems at petroleum refineries and alternative fuel production facilities; expansion of public transit systems; and land use changes and changes to fuel-associated shipment patterns.

In addition, short term agricultural land use changes could result in removal of existing vegetation, immediate loss of natural habitat and subsequent reduction in biodiversity,[84] displacement of agricultural land used for food production, and immediate change to the physiological and hydrological configuration of the existing land due to grading.

Short-term construction-related impacts on land use and planning associated with implementation of the Proposed Amendments may not be consistent with existing and planned land uses. The environmental consequences of land use changes are considered in their respective sections of this ~~Draft~~ Final EIA.

Potential environmental impacts associated with land use change on agriculture and forestry, biology, geology and soils, hydrology, and others specifically their related mitigation measures are discussed in further detail under Impacts 2-1, 2-2, 4-1, 4-2, 8-1, 10-1, and others as applicable.

Nevertheless, as discussed in Chapter 4.0, in Sections 2, “Agriculture and Forestry Resources,” 4, “Biological Resources,” 7, “Geology and Soils,” and 10, “Hydrology and Water Quality,” potential environmental effects associated with land use change would be significant. Therefore, land use impacts would be significant.

Construction and operation of new manufacturing, disposal, fuel production and recycling facilities may require the conversion of non-industrial land uses to industrial

[84] Bertzky, M., Kapos, V., & Scharlemann, J.P.W., *Indirect Land Use Change from Biofuel Production: Implications for Biodiversity*. August 2011. *http://www.cbd.int/agriculture/2011-121/UNEP-WCMC-JNCC%20report-sep11-en.pdf*

land uses. Potential environmental effects associated with land use change on agriculture and forestry, biological resources, geology, and soils, and hydrology and their related mitigation measures are discussed in further detail in their respective section of this ~~Draft~~ Final EIA.

New or expanded manufacturing, disposal, fuel production and recycling facilities would be subject to local zoning ordinances and would generally be located on sites planned for those types of facilities, which are typically placed apart from residential communities and would not typically divide an established community. Also, projects that are more likely to divide an established community tend to be linear (e.g., new highway, railroad). New transmission lines to support EV charging and other electrification would also not typically divide an established community because they are generally either undergrounded or strung on lines and therefore do not obstruct travel or lines of site between areas of the community. Therefore, the Proposed Amendments would not have the potential to divide a community and would have a less-than-significant effect to this impact.

Nevertheless, as discussed in Chapter 4.0, in Sections 2, “Agriculture and Forestry Resources,” 4, “Biological Resources,” 7, “Geology and Soils,” and 10, “Hydrology and Water Quality,” potential environmental effects associated with land use change would be significant. Therefore, short-term construction-related and long-term operation-related land use impacts would be significant.

Mitigation Measure 11-1: Implement Mitigation Measures 2-1, 4-1, 7-1, and 10-1

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 EIA 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 significant impacts. Although unlikely after implementation of Mitigation Measure 11-1, it is possible that significant impacts related to land use conversions could still result in significant effects on various resource areas.

Consequently, while impacts could be reduced to a less-than-significant level with mitigation measures imposed by the land use and/or permitting agencies acting as lead agencies for these individual projects under CEQA, if and when a project proponent seeks a permit for compliance-response related project, this ~~Draft~~ Final EIA takes the conservative approach in its post-mitigation significance conclusion and discloses, for CEQA compliance purposes, that the potential short-term construction-related and long-term operation-related impacts related to land use conversions associated with the Proposed Amendments would remain **significant and unavoidable**.

Impact 11-2: Long-Term Operational Impacts on Land Use Related to Feedstock Production

Reasonably foreseeable compliance responses associated with the Proposed Amendments include the following responses, which could result in changes to the existing physical environment: modifications to cultivation volume and transport of feedstock; changes to location and types of feedstock; new or modified processing facilities for feedstock and finished fuel production; increased transportation of finished alternative fuels to blending terminals or retail fuel sites; construction and operation of new facilities to produce renewable diesel, renewable gasoline, AJF, and renewable propane; construction of biomass gasification and pyrolysis systems for hydrogen and renewable natural gas production; construction of new anaerobic facilities to digest manure from dairies, sewage from wastewater treatment plants, and organic waste diverted from landfills; construction of infrastructure to collect biogas and produce methane; construction of stand-alone and bolt-on cellulosic processing units for renewable fuels production; increase in collection of yard waste or removal of forest litter and agricultural residues; construction of electrolysis units and substitution of renewable natural gas for fossil gas in production of hydrogen; construction of solar and wind electricity generation projects; modification to existing or new industrial facilities to capture CO_2 emissions; construction of new infrastructure such as pipelines, wells and other surface facilities; construction and operation of additional refueling hydrogen stations and EV charging stations; modifications to electricity distribution and transmission infrastructure; modifications to existing crude production facilities to accommodate solar and wind electricity, solar heat, and/or solar steam generation; electrification of equipment and installation of renewable electricity and battery storage systems at petroleum refineries and alternative fuel production facilities; expansion of public transit systems; and land use changes and changes to fuel-associated shipment patterns.

Implementation of the Proposed Amendments could result in compliance responses that include operation of new feedstock or fuel production facilities, including biofuel and hydrogen, processing or distribution facilities, extended cultivation of biofuel crops, changes in agricultural land uses from one crop to another crop, and expansion of agricultural land onto neighboring undeveloped lands such as natural grasslands or forests. In general, however, these activities exist under existing conditions. For example, any new farmland used for feedstock cultivation is likely to be adjacent to similar uses, and forests are subject to periodic forest management activities, such as thinning, hazardous fuel removal, replanting, and timber harvest. There could also be increased infrastructure for hydrogen refueling and electric vehicle charging stations. This could occur on undeveloped land, or on existing refueling or parking footprints such as gasoline and diesel fueling stations or existing parking lots. Studies have shown that demands for biofuel crops can incur both direct and indirect land use changes at both the national and international levels resulting in the displacement of existing agriculture

or natural habitats.[85,86,87] Direct and indirect land use change associated with the Proposed Amendments would depend on the types of feedstocks used, as determined, in large part, by market forces along with total biofuel feedstock demand. Certain biofuel crops could require a combination of additional land, fertilizer, water, and agricultural management practices to produce the same volume of biofuel than other biofuel crops. The Proposed Amendments are designed to incentivize fuel pathways with lower CI values, which include land use change related GHG emissions. Due to the market-driven nature of the future biofuel mix, an increased demand for low-CI fuels could possibly incur higher non-GHG land use change impacts than a higher-CI fuel, especially if the low-CI fuel feedstocks are sourced from an area with a sensitive ecosystem or geology. However, compliance responses, such as increased use of renewable diesel, would generally prioritize the use of materials from waste reduction practices over feedstocks that increase land use change. Impacts associated with long-term land use and planning are wide-reaching, affecting nearly all resource impact areas, especially when considering indirect land use changes. The proposed crop-based biofuels sustainability criteria would additionally help protect against potential future land use impacts.

With respect to effects related to only land use and planning, the long-term conversion of lands required to meet the upstream demands for fuels to meet the Proposed Amendments could also conflict with local conservation plans or zoning policies. The increased demand could result in continued occurrences of direct land use change due to the expansion of agricultural lands and continued occurrences of indirect expansion of displaced agricultural lands. This could then result in an intensification of adverse effects associated with the conversion or modification of natural land or existing agriculture. The environmental consequences of land use changes are considered in their respective sections of this ~~Draft~~ Final EIA.

Long-term environmental impacts associated with land use change and related mitigation measures are discussed in further detail under Impacts 2-1, 2-2, 4-1, 4-2, 7-1, 8-1, 10-1, and others as applicable.

As discussed in Chapter 4, in Sections 2, “Agriculture and Forestry Resources,” 4, “Biological Resources,” 7, “Geology and Soils,” and 10, “Hydrology and Water Quality,”

---

[85] Austin, K. G., Jones, J. P. H., & Clark, C. M., *A review of domestic land use change attributable to US biofuel policy*. Renewable and Sustainable Energy Reviews, 159. May 2022. *https://doi.org/10.1016/j.rser.2022.112181*

[86] Gohin, A., *The Land Use Impacts of the EU Biodiesel Policy: Assessing the Direct, Indirect and Induced Effects*. Journal of Agricultural Economics, 71(2), 305-329. June 2020. *https://onlinelibrary.wiley.com/doi/abs/10.1111/1477-9552.12365*

[87] Malins, C., Plevin, R., & Edwards, R., *How robust are reductions in modeled estimates from GTAP-BIO of the indirect land use change induced by conventional biofuels?* Journal of Cleaner Production, 258. June 10, 2020. *https://www.sciencedirect.com/science/article/abs/pii/S0959652620307630*

potential environmental effects associated with land use change would be significant. Therefore, long-term operation-related land use impacts would be significant.

Mitigation Measure 11-2: Implement Mitigation Measures 2-1, 2-2, 4-1, 4-2, 7-1, 8-1, and 10-1

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 EIA 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 significant impacts. Although unlikely after implementation of Mitigation Measures 2-1, 2-2, 4-1, 4-2, 7-1, 8-1, and 10-1, it is possible that significant impacts related to land use conversions could still result in significant effects on various resource areas.

Consequently, while impacts could be reduced to a less-than-significant level with mitigation measures imposed by the land use and/or permitting agencies acting as lead agencies for these individual projects under CEQA, if and when a project proponent seeks a permit for compliance-response related project, this ~~Draft~~ Final EIA takes the conservative approach in its post-mitigation significance conclusion and discloses, for CEQA compliance purposes, that the potential short-term construction-related and long-term operation-related impacts related to land use conversions associated with the Proposed Amendments would remain **significant and unavoidable**.

12. Mineral Resources

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

Reasonably foreseeable compliance responses associated with the Proposed Amendments include the following responses, which could result in changes to the existing physical environment: modifications to cultivation volume and transport of feedstock; changes to location and types of feedstock; new or modified processing facilities for feedstock and finished fuel production; increased transportation of finished alternative fuels to blending terminals or retail fuel sites; construction and operation of new facilities to produce renewable diesel, renewable gasoline, AJF, and renewable propane; construction of biomass gasification and pyrolysis systems for hydrogen and renewable natural gas production; construction of new anaerobic facilities to digest manure from dairies, sewage from wastewater treatment plants, and organic waste diverted from landfills; construction of infrastructure to collect biogas and produce methane; construction of stand-alone and bolt-on cellulosic processing units for renewable fuels production; increase in collection of yard waste or removal of forest litter and agricultural residues; construction of electrolysis units and substitution of renewable natural gas for fossil gas in production of hydrogen; construction of solar and wind electricity generation projects; modification to existing or new industrial facilities to capture CO_2 emissions; construction of new infrastructure such as pipelines, wells and other surface facilities; construction and operation of additional refueling hydrogen

stations and EV charging stations; modifications to electricity distribution and transmission infrastructure; modifications to existing crude production facilities to accommodate solar and wind electricity, solar heat, and/or solar steam generation; electrification of equipment and installation of renewable electricity and battery storage systems at petroleum refineries and alternative fuel production facilities; expansion of public transit systems; and land use changes and changes to fuel-associated shipment patterns.

Although it is reasonably foreseeable that construction activities could occur, the location and extent of construction activities related to new or modified facilities and infrastructure cannot be determined at this time. Construction associated with new or modified facilities would likely occur within existing footprints or in areas with consistent zoning, where original permitting and analyses considered mineral resource issues. Although construction of new infrastructure could occur in areas outside the footprints of existing facilities, short-term construction impacts would only temporarily affect the availability of known mineral resources. As a result, construction of new facilities for low-carbon fuel projects would not affect the availability of a known mineral resource or recovery site.

Appendix G of the CEQA Guidelines considers an impact on mineral resources to be the loss of availability of a known mineral resource that would be of value to a local entity, a region, or the State. Local jurisdictions are responsible for identifying appropriate areas to protect and/or allow mining of mineral resources. Facilities developed in response to implementation of the Proposed Amendments would be located in areas within existing footprints or in areas with consistent zoning where original permitting and analyses considered these issues and would not preclude access to a known mineral resource. Mining-related impacts associated with the reasonably foreseeable compliance responses of the Proposed Amendments are discussed throughout this ~~Draft~~ Final EIA (e.g., see the “Aesthetics,” “Agriculture and Forestry Resources,” “Hazards and Hazardous Materials,” “Hydrology and Water Quality,” and “Transportation” sections).

Thus, short-term construction-related mineral resources impacts associated with the Proposed Amendments would be **less than significant**.

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

Reasonably foreseeable compliance responses associated with the Proposed Amendments include the following responses, which could result in changes to the existing physical environment: modifications to cultivation volume and transport of feedstock; changes to location and types of feedstock; new or modified processing facilities for feedstock and finished fuel production; increased transportation of finished alternative fuels to blending terminals or retail fuel sites; construction and operation of new facilities to produce renewable diesel, renewable gasoline, AJF, and renewable propane; construction of biomass gasification and pyrolysis systems for hydrogen and renewable natural gas production; construction of new anaerobic facilities to digest

manure from dairies, sewage from wastewater treatment plants, and organic waste diverted from landfills; construction of infrastructure to collect biogas and produce methane; construction of stand-alone and bolt-on cellulosic processing units for renewable fuels production; increase in collection of yard waste or removal of forest litter and agricultural residues; construction of electrolysis units and substitution of renewable natural gas for fossil gas in production of hydrogen; construction of solar and wind electricity generation projects; modification to existing or new industrial facilities to capture CO_2 emissions; construction of new infrastructure such as pipelines, wells and other surface facilities; construction and operation of additional refueling hydrogen stations and EV charging stations; modifications to electricity distribution and transmission infrastructure; modifications to existing crude production facilities to accommodate solar and wind electricity, solar heat, and/or solar steam generation; electrification of equipment and installation of renewable electricity and battery storage systems at petroleum refineries and alternative fuel production facilities; expansion of public transit systems; and land use changes and changes to fuel-associated shipment patterns.

Long-term operational compliance responses associated with the Proposed Amendments include increased mining and processing of rare materials used in solar panels, as well as increased mining and processing of metals used as catalysts to produce low-CI fuels. Depending on the magnitude of required materials, implementation of the Proposed Amendments could affect the availability of known minerals.

The proposed project would also result in additional mining of several of the mineral commodities needed for the production and use of solar panels and wind turbines are listed by the U.S. Geological Survey as Critical Minerals.[88] The U.S. Geological Survey Critical Minerals list was developed to identify critical minerals and develop a strategy to address U.S. supply-chain vulnerabilities. The critically listed commodities that would be impacted by the Proposed Amendments are arsenic, gallium, germanium, indium, tellurium, aluminum, and rare earth metals. Among these minerals, arsenic, gallium, and indium are exclusively sourced from imports from outside countries. Over three quarters of tellurium and rare-earth metals are sources from outside nations. Additionally, the United States relies on imports for over half of the country's supply of germanium and aluminum.[89] The Proposed Amendments would increase the demand for the listed minerals and would result in significant impact to the availability and supply of the minerals.

[88] United States Geological Survey, *Critical Mineral Commodities in Renewable Energy.* June 4, 2019. *https://www.usgs.gov/media/images/critical-mineral-commodities-renewable-energy#Solar%20Panels*
[89] United States Geological Survey, Mineral Commodity Summaries 2023. 2023. *https://pubs.usgs.gov/periodicals/mcs2023/mcs2023.pdf*

The Proposed Amendments will also reduce demand for petroleum fuels by incentivizing production and consumption of low-carbon alternatives. Crude oil extraction activities could be reduced significantly in response to this decline in petroleum demand, resulting in reduced impacts on mineral resources within California.

Long-term operational related mineral resources impacts associated with the Proposed Amendments would be significant.

Potential mineral resource impacts could be reduced to a less-than-significant level by mitigation measures prescribed by local, state, federal, or other land use or permitting agencies (either in the U.S. or abroad) with approval authority over the particular development projects. However, because CARB has no land use authority, mitigation is not within its purview to reduce significant impacts to less-than-significant levels.

Mitigation Measure 12-1

The Regulatory Setting in Attachment 1 includes applicable laws and regulations that provide protection of mineral resources. CARB 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 most likely 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. The following recognized practices are routinely required to avoid and/or minimize impacts on mineral resources:

- Proponents of construction activities implemented as a result of reasonably foreseeable compliance responses associated with the Proposed Regulation 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 impacts on mineral resources associated with the project.
- Actions required to mitigate potentially significant mineral resource 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 an investigation/study,

which would include an evaluation of the development's impact on the availability of mineral resources valuable to the region and residents of the State or delineated on a local general plan, specific plan, or other land use plan.

- Proponents of new or modified facilities or infrastructure would provide a complete site plan showing any overlapping areas between the proposed plan and locally important mineral resources delineated on a local general plan, specific plan, or other land use plan. Proponents would avoid locating facilities that would result in the loss of availability of locally important mineral resources, as much as possible.

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 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 EIA takes the conservative approach in its post-mitigation significance conclusion and discloses, for CEQA compliance purposes, that long-term operational-related impacts to mineral resources would be **significant and unavoidable**.

13. Noise and Vibration

Impact 13-1: Short-Term Construction-Related Impacts to Noise and Vibration

Reasonably foreseeable compliance responses associated with the Proposed Amendments include the following responses, which could result in changes to the existing physical environment: modifications to cultivation volume and transport of feedstock; changes to location and types of feedstock; new or modified processing facilities for feedstock and finished fuel production; increased transportation of finished alternative fuels to blending terminals or retail fuel sites; construction and operation of new facilities to produce renewable diesel, renewable gasoline, AJF, and renewable propane; construction of biomass gasification and pyrolysis systems for hydrogen and renewable natural gas production; construction of new anaerobic facilities to digest manure from dairies, sewage from wastewater treatment plants, and organic waste diverted from landfills; construction of infrastructure to collect biogas and produce methane; construction of stand-alone and bolt-on cellulosic processing units for renewable fuels production; increase in collection of yard waste or removal of forest litter and agricultural residues; construction of electrolysis units and substitution of renewable natural gas for fossil gas in production of hydrogen; construction of solar and wind electricity generation projects; modification to existing or new industrial facilities to capture CO_2 emissions; construction of new infrastructure such as pipelines, wells and other surface facilities; construction and operation of additional refueling hydrogen

stations and EV charging stations; modifications to electricity distribution and transmission infrastructure; modifications to existing crude production facilities to accommodate solar and wind electricity, solar heat, and/or solar steam generation; electrification of equipment and installation of renewable electricity and battery storage systems at petroleum refineries and alternative fuel production facilities; expansion of public transit systems; and land use changes and changes to fuel-associated shipment patterns.

Construction noise levels that could result from reasonably foreseeable compliance responses 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 construction-related 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 sound level (L_{eq}) at 50 feet and maximum noise levels of 90 dBA maximum noise levels (L_{max}) 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 L_{eq}/L_{max} during the daytime hours and 40/50 dBA L_{eq}/L_{max} during the nighttime hours).

Additionally, construction activities may result in varying degrees of temporary ground-borne noise and vibration, depending on the specific construction equipment used and activities involved. Ground-borne noise and vibration levels caused by various types of construction equipment and activities (e.g., bulldozers, blasting) range from 58 to 109 vibration decibels (VdB) and from 0.003 to 0.089 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 ground borne 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 the Proposed Amendments would be significant.

Potential noise impacts could be reduced to a less-than-significant level by mitigation measures prescribed by local, state, federal, or other land use or permitting agencies (either in the U.S. or abroad) with approval authority over the particular development projects. However, because CARB has no land use authority, mitigation is not within its purview to reduce significant impacts to less-than-significant levels.

Mitigation Measure 13-1

The Regulatory Setting in Attachment A includes, but is not limited to, applicable laws and regulations that pertain to noise. CARB 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 measures would be identified during the environmental review by agencies with project-approval authority. The following recognized practices are routinely required to avoid and/or minimize noise:

- Proponents of new or modified facilities constructed under the 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 would certify that the environmental document was prepared in compliance with applicable regulations and would approve the project for development.
- Based on the results of the environmental review, proponents would implement all mitigation identified in the environmental document to reduce or substantially lessen the environmental impacts of the project. The definition of 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.
    - Use noise barriers, such as berms, as needed (where feasible) 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.
    - Use battery-powered forklifts and other facility vehicles, as needed to remain within acceptable noise levels.

- 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-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, and shield impact tools.
- Use flashing lights instead of audible back-up alarms on mobile equipment, if necessary to maintain acceptable noise levels.
- 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 the programmatic level of analysis associated with this ~~Draft~~ Final EIA 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 significant impacts. Although unlikely after implementation of Mitigation Measure 13-1, it is possible that significant impacts on noise and vibration could still occur.

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 EIA takes the conservative approach in its post-mitigation significance conclusion and discloses, for CEQA compliance purposes, that the short-term construction-related effect regarding noise and vibration resulting from the construction of new facilities or reconstruction of existing facilities associated with the Proposed Amendments would remain **significant and unavoidable**.

Impact 13-2: Long-Term Operational-Related Impacts to Noise and Vibration

Reasonably foreseeable compliance responses associated with the Proposed Amendments include the following responses, which could result in changes to the existing physical environment: modifications to cultivation volume and transport of feedstock; changes to location and types of feedstock; new or modified processing facilities for feedstock and finished fuel production; increased transportation of finished alternative fuels to blending terminals or retail fuel sites; construction and operation of new facilities to produce renewable diesel, renewable gasoline, AJF, and renewable propane; construction of biomass gasification and pyrolysis systems for hydrogen and renewable natural gas production; construction of new anaerobic facilities to digest manure from dairies, sewage from wastewater treatment plants, and organic waste diverted from landfills; construction of infrastructure to collect biogas and produce methane; construction of stand-alone and bolt-on cellulosic processing units for renewable fuels production; increase in collection of yard waste or removal of forest litter and agricultural residues; construction of electrolysis units and substitution of renewable natural gas for fossil gas in production of hydrogen; construction of solar and wind electricity generation projects; modification to existing or new industrial facilities to capture CO_2 emissions; construction of new infrastructure such as pipelines, wells and other surface facilities; construction and operation of additional refueling hydrogen stations and EV charging stations; modifications to electricity distribution and transmission infrastructure; modifications to existing crude production facilities to accommodate solar and wind electricity, solar heat, and/or solar steam generation; electrification of equipment and installation of renewable electricity and battery storage systems at petroleum refineries and alternative fuel production facilities; expansion of public transit systems; and land use changes and changes to fuel-associated shipment patterns.

Implementation of the Proposed Amendments could result in changes to land use to collect or cultivate biofuel feedstock, as described above in Section 11 “Land Use and Planning.” In general, these activities exist under existing conditions. For example, any new farmland used for feedstock cultivation is likely to be adjacent to similar uses; and, forests are subject to periodic forest management activities, such as thinning, hazardous fuel removal, replanting, and timber harvest. However, the intensity and frequency of these activities could increase to provide additional biomass in response to the Proposed Amendments, which would result in a substantial increase in ambient noise levels.

New sources of noise associated with implementation of the Proposed Amendments could include operation of new facilities, such as truck loading and unloading, biofuel processing plants, carbon capture and storage operations, hydrogen production, fixed guideways; dairy and wastewater treatment anaerobic digesters; installation of new equipment associated with modification to dairies, landfills, and wastewater treatment and oil and gas facilities; and wind farms. Digester and new equipment noise levels

could exceed applicable noise standards and result in a substantial increase in ambient noise levels.

Implementation of renewable energy supply projects could result in additional vehicle trips on the affected roadway systems from worker commute-, maintenance/operation, and material delivery-related trips and, consequently, an increase in traffic source noise. The exact number of daily trips required for project operations and the location of roadway segments that would be affected are unknown at this time.

Additionally, implementation of the new facilities and projects could introduce new on-site stationary noise sources, including rooftop heating, ventilation, and air conditioning equipment; mechanical equipment (e.g., turbines, engines, pumps, blowers); emergency generators; parking lot activities; loading operations; and other related operational activities.

Implementation of CCS could include development of direct air capture facilities. The design of future facilities could vary considerably, ranging from tall, multi-story structures to low-profile structures covering a potentially large area of land. Depending on the size of these facilities, intake fans would emit varying degree of noise that may be substantial depending on the location. These new or modified facilities would likely be located in areas with zoning that would permit the development of industrial uses or on public lands where the appropriate State or federal agency has determined that such uses are allowable. However, the locations of infrastructure to transport captured CO2 emissions (e.g., pumping stations for CO2 transport through pipelines) may operate in areas outside of the footprints of existing facilities or areas zoned for manufacturing or industrial uses, depending on the locations of the storage reservoirs.

Long-term operational noise impacts associated with the Proposed Amendments would be significant.

Potential noise impacts could be reduced to a less-than-significant level by mitigation measures prescribed by local, state, federal, or other land use or permitting agencies (either in the U.S. or abroad) with approval authority over the particular development projects. However, because CARB has no land use authority, mitigation is not within its purview to reduce significant impacts to less-than-significant levels.

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 the programmatic level of analysis associated with this ~~Draft~~ Final EIA 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 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 EIA 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 Proposed Amendments would be **significant and unavoidable.**

14. Population and Housing

Impact 14-1: Short-Term Construction-Related and Long-Term Operation-Related Impacts to Population and Housing

Reasonably foreseeable compliance responses associated with the Proposed Amendments include the following responses, which could result in changes to the existing physical environment: modifications to cultivation volume and transport of feedstock; changes to location and types of feedstock; new or modified processing facilities for feedstock and finished fuel production; increased transportation of finished alternative fuels to blending terminals or retail fuel sites; construction and operation of new facilities to produce renewable diesel, renewable gasoline, AJF, and renewable propane; construction of biomass gasification and pyrolysis systems for hydrogen and renewable natural gas production; construction of new anaerobic facilities to digest manure from dairies, sewage from wastewater treatment plants, and organic waste diverted from landfills; construction of infrastructure to collect biogas and produce methane; construction of stand-alone and bolt-on cellulosic processing units for renewable fuels production; increase in collection of yard waste or removal of forest litter and agricultural residues; construction of electrolysis units and substitution of renewable natural gas for fossil gas in production of hydrogen; construction of solar and wind electricity generation projects; modification to existing or new industrial facilities to capture CO_2 emissions; construction of new infrastructure such as pipelines, wells and other surface facilities; construction and operation of additional refueling hydrogen stations and EV charging stations; modifications to electricity distribution and transmission infrastructure; modifications to existing crude production facilities to accommodate solar and wind electricity, solar heat, and/or solar steam generation; electrification of equipment and installation of renewable electricity and battery storage systems at petroleum refineries and alternative fuel production facilities; expansion of public transit systems; and land use changes and changes to fuel-associated shipment patterns.

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, a substantial amount of construction worker migration would not be likely to occur, and a sufficient construction employment base would likely be available. Implementation of the Proposed Amendments could result in increased demand of biofuel feedstock, which would require farmers for agricultural activities, such as plantation and harvest of energy and oil crops, and workers for forest activities, such as forest thinning and timber harvest. Operation of these new facilities would not be expected to require new additional housing or generate changes in land use that could conflict with adopted plans.

The implementation of the Proposed Amendments is expected to lead to job losses in the petroleum and coal products manufacturing industry as demand for these fuels is expected to decrease. As cleaner, alternative fuels displace some petroleum-based fuels, jobs may shift from the petroleum industry to other sectors of California's economy, such as basic chemical manufacturing and electric power generation, transmission, and distribution.[90] The shift in consumer dollars from gasoline and diesel toward cleaner, more domestically produced fuels would spur growth in jobs in the clean fuels industry.

Therefore, short-term construction- and long-term operational impacts on population growth, and displacement of housing or people associated with the Proposed Amendments would be **less than significant**.

15. Public Services

Impact 15-1: Short-Term Construction-Related and Long-Term Operation-Related Impacts to Public Services

Reasonably foreseeable compliance responses associated with the Proposed Amendments include the following responses, which could result in changes to the existing physical environment: modifications to cultivation volume and transport of feedstock; changes to location and types of feedstock; new or modified processing facilities for feedstock and finished fuel production; increased transportation of finished alternative fuels to blending terminals or retail fuel sites; construction and operation of new facilities to produce renewable diesel, renewable gasoline, AJF, and renewable propane; construction of biomass gasification and pyrolysis systems for hydrogen and renewable natural gas production; construction of new anaerobic facilities to digest manure from dairies, sewage from wastewater treatment plants, and organic waste diverted from landfills; construction of infrastructure to collect biogas and produce methane; construction of stand-alone and bolt-on cellulosic processing units for renewable fuels production; increase in collection of yard waste or removal of forest litter and agricultural residues; construction of electrolysis units and substitution of renewable natural gas for fossil gas in production of hydrogen; construction of solar and wind electricity generation projects; modification to existing or new industrial facilities to capture CO_2 emissions; construction of new infrastructure such as pipelines, wells and other surface facilities; construction and operation of additional refueling hydrogen stations and EV charging stations; modifications to electricity distribution and transmission infrastructure; modifications to existing crude production facilities to accommodate solar and wind electricity, solar heat, and/or solar steam generation; electrification of equipment and installation of renewable electricity and battery storage systems at petroleum refineries and alternative fuel production facilities; expansion of

[90] California Air Resources Board, *Low Carbon Fuel Standard 2023 Amendments: Standardized Regulatory Impact Assessment (SRIA), California Employment Impacts*. 69-71. September 8, 2023. *https://ww2.arb.ca.gov/sites/default/files/2023-09/lcfs_sria_2023_0.pdf*

public transit systems; and land use changes and changes to fuel-associated shipment patterns.

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. However, these would likely occur within footprints of existing facilities, or 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. Construction and operational activities would not require new additional housing to accommodate or generate changes in land use and would not impact response time for fire protection and police protection, and other public services. Forest thinning and hazardous fuel removal could provide benefits to the public services as these activities reduce forest fire risks.

As a result, short-term construction- and long-term operational impacts, associated with the Proposed Amendments, on response time for fire protection, police protection, schools, parks, and other facilities would be **less than significant**.

16. Recreation

Impact 16-1: Short-Term Construction-Related and Long-Term Operation-Related Impacts to Recreation

Reasonably foreseeable compliance responses associated with the Proposed Amendments include the following responses, which could result in changes to the existing physical environment: modifications to cultivation volume and transport of feedstock; changes to location and types of feedstock; new or modified processing facilities for feedstock and finished fuel production; increased transportation of finished alternative fuels to blending terminals or retail fuel sites; construction and operation of new facilities to produce renewable diesel, renewable gasoline, AJF, and renewable propane; construction of biomass gasification and pyrolysis systems for hydrogen and renewable natural gas production; construction of new anaerobic facilities to digest manure from dairies, sewage from wastewater treatment plants, and organic waste diverted from landfills; construction of infrastructure to collect biogas and produce methane; construction of stand-alone and bolt-on cellulosic processing units for renewable fuels production; increase in collection of yard waste or removal of forest litter and agricultural residues; construction of electrolysis units and substitution of renewable natural gas for fossil gas in production of hydrogen; construction of solar and wind electricity generation projects; modification to existing or new industrial facilities to capture CO_2 emissions; construction of new infrastructure such as pipelines, wells and other surface facilities; construction and operation of additional refueling hydrogen stations and EV charging stations; modifications to electricity distribution and

transmission infrastructure; modifications to existing crude production facilities to accommodate solar and wind electricity, solar heat, and/or solar steam generation; electrification of equipment and installation of renewable electricity and battery storage systems at petroleum refineries and alternative fuel production facilities; expansion of public transit systems; and land use changes and changes to fuel-associated shipment patterns.

These activities would likely occur within footprints of existing manufacturing facilities, or in areas with appropriate zoning. In addition, demand for these crews would be temporary (e.g., 6–12 months per project) and would not be anticipated to substantially increase regional population levels. Construction and operational activities associated with reasonably foreseeable compliance responses would not be anticipated to result in increased use of regional parks and other recreational facilities, such that existing neighborhood and regional parks or other recreational facilities would be substantially deteriorated. In addition, because construction crews would be temporary, and facilities would likely require few employees to run new or modified facilities, the demand for new (or expansion of) recreation-related facilities is not anticipated, and no substantial operational recreation impacts would be expected.

Therefore, short-term construction-related and long-term operational impacts on regional parks or other recreational facilities associated with the Proposed Amendments would be **less than significant**.

17. Transportation

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

Reasonably foreseeable compliance responses associated with the Proposed Amendments include the following responses, which could result in changes to the existing physical environment: modifications to cultivation volume and transport of feedstock; changes to location and types of feedstock; new or modified processing facilities for feedstock and finished fuel production; increased transportation of finished alternative fuels to blending terminals or retail fuel sites; construction and operation of new facilities to produce renewable diesel, renewable gasoline, AJF, and renewable propane; construction of biomass gasification and pyrolysis systems for hydrogen and renewable natural gas production; construction of new anaerobic facilities to digest manure from dairies, sewage from wastewater treatment plants, and organic waste diverted from landfills; construction of infrastructure to collect biogas and produce methane; construction of stand-alone and bolt-on cellulosic processing units for renewable fuels production; increase in collection of yard waste or removal of forest litter and agricultural residues; construction of electrolysis units and substitution of renewable natural gas for fossil gas in production of hydrogen; construction of solar and wind electricity generation projects; modification to existing or new industrial facilities to capture CO_2 emissions; construction of new infrastructure such as pipelines, wells and other surface facilities; construction and operation of additional refueling hydrogen

stations and EV charging stations; modifications to electricity distribution and transmission infrastructure; modifications to existing crude production facilities to accommodate solar and wind electricity, solar heat, and/or solar steam generation; electrification of equipment and installation of renewable electricity and battery storage systems at petroleum refineries and alternative fuel production facilities; expansion of public transit systems; and land use changes and changes to fuel-associated shipment patterns.

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. This impact would be significant.

Potential transportation impacts could be reduced to a less-than-significant level by mitigation measures prescribed by local, state, federal, or other land use or permitting agencies (either in the U.S. or abroad) with approval authority over the particular development projects. However, because CARB has no land use authority, mitigation is not within its purview to reduce significant impacts to less-than-significant levels.

Mitigation Measure 17-1

The Regulatory Setting in Attachment A includes applicable laws and regulations regarding transportation. CARB 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 measures would be identified during the environmental review by agencies with project-approval authority. The following recognized practices are routinely required to avoid and/or minimize construction traffic impacts:

- Proponents of new or modified facilities constructed will 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 will certify that the

environmental document was prepared in compliance with applicable regulations and will approve the project for development.

- Based on the results of the environmental review, proponents will implement all mitigation identified in the environmental document to reduce or substantially lessen potentially significant impacts on traffic and transportation. The definition of actions required to mitigate potentially significant traffic impacts may include the following; however, any mitigation specifically required for a new or modified facility will 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 a 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 the programmatic level of analysis associated with this ~~Draft~~ Final EIA 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 significant impacts. Although unlikely after implementation of Mitigation Measure 17-1, it is possible that significant impacts on transportation and traffic resources could still occur.

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 EIA takes the conservative approach in its post-mitigation significance conclusion and discloses, for CEQA compliance purposes, that short-term construction-related effects to transportation and traffic associated with the Proposed Amendments would remain **significant and unavoidable**.

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

Reasonably foreseeable compliance responses associated with the Proposed Amendments include the following responses, which could result in changes to the existing physical environment: modifications to cultivation volume and transport of feedstock; changes to location and types of feedstock; new or modified processing facilities for feedstock and finished fuel production; increased transportation of finished alternative fuels to blending terminals or retail fuel sites; construction and operation of new facilities to produce renewable diesel, renewable gasoline, AJF, and renewable propane; construction of biomass gasification and pyrolysis systems for hydrogen and renewable natural gas production; construction of new anaerobic facilities to digest manure from dairies, sewage from wastewater treatment plants, and organic waste diverted from landfills; construction of infrastructure to collect biogas and produce methane; construction of stand-alone and bolt-on cellulosic processing units for renewable fuels production; increase in collection of yard waste or removal of forest litter and agricultural residues; construction of electrolysis units and substitution of renewable natural gas for fossil gas in production of hydrogen; construction of solar and wind electricity generation projects; modification to existing or new industrial facilities to capture CO_2 emissions; construction of new infrastructure such as pipelines, wells and other surface facilities; construction and operation of additional refueling hydrogen stations and EV charging stations; modifications to electricity distribution and transmission infrastructure; modifications to existing crude production facilities to accommodate solar and wind electricity, solar heat, and/or solar steam generation; electrification of equipment and installation of renewable electricity and battery storage systems at petroleum refineries and alternative fuel production facilities; expansion of public transit systems; and land use changes and changes to fuel-associated shipment patterns.

As shown in Figure 1, demand in California for ethanol could decrease up to 2045, in tandem with an overall demand reduction in gasoline. This potential shift could result in a decrease in shipments of ethanol from existing sources (California, other States, and Brazil). The proposed amendments would likely also increase demand for biomass-based diesel and alternative jet fuel. Historically, these fuels have largely been produced outside of California and imported to the State. However, announced production capacity for renewable diesel and alternative jet fuel in California has increased substantially in recent years and it is possible that an increasing proportion of the renewable diesel and alternative jet fuel demanded in future years of the program would be met by California sources. Imports from existing sources could potentially continue for renewable diesel and alternative jet fuel. Increases in biodiesel production capacity have not been announced in California, and staff assumes that increases in biodiesel fuel volumes would be imported from existing sources in the United States. An attempt to determine the exact times and quantities of different types of low-carbon and alternative diesel fuels would be speculative. The location of export and import is based upon numerous unknown factors including weather patterns, demand, and other

economic drivers. While changes to the existing trade patterns can be anticipated, as described above, the ability to ship and receive products is within the purview of relevant international ports, train depots, and the companies buying and selling products. It is therefore reasonable to assume that the existing infrastructure would be expanded to meet a growing need for transportation of low carbon fuel to and within California, as well as to manage increased production capacity for renewable diesel, hydrogen, and alternative jet fuel within California.

Upon entering the State, low-carbon and alternative diesel fuels would be transported to appropriate facilities (e.g., blending facilities, distribution centers). The effects of the Proposed Amendments on changing fuel transportation would be dependent on feedstock demand and processing needs in a particular area.

The implementation of the Proposed Amendments is expected to increase the production of cellulosic ethanol, renewable diesel, AJF, hydrogen, biomethane, and propane in California. Transportation of biomass feedstock such as cellulosic biomass, plant oils, used cooking oils and animal fat, or other materials used in the production of transportation fuels, such as livestock manure or biogas, could result in adverse impacts on transportation and traffic, including traffic congestion, pavement damage, and accidents. Depending on the amount of trip generation 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. This impact would be significant.

The implementation of the Proposed Amendments is expected to reduce the amount of crude oil transported by transoceanic tanks, pipelines, and rail. Distribution of gasoline and diesel from refineries to blending facilities is expected to decrease, but distribution of low carbon fuels such as renewable diesel and AJF would increase.

Implementation of the Proposed Amendments could result in the operation of new infrastructure to distribute alternate fuels (such as electricity, hydrogen, and biomethane). As discussed in Impact 14-1, it is not anticipated that a substantial amount of new personnel would be needed to operate new facilities because a sufficient employment base would be available[91], indicating that vehicle miles traveled (VMT) associated with employees may not substantially increase depending on their location. The analysis for the Proposed Amendments took a conservative approach to modeling VMT, and assumed no reductions in per capita VMT at a statewide level. Locations of facilities with newly installed infrastructure to distribute and dispense alternative fuels

[91] California Air Resources Board, *Low Carbon Fuel Standard 2023 Amendments: Standardized Regulatory Impact Assessment (SRIA*). September 8, 2023. *https://ww2.arb.ca.gov/sites/default/files/2023-09/lcfs_sria_2023_0.pdf*

cannot currently be known; therefore, the total change in VMT associated with particular facilities was not assessed in this analysis. Local projects would be subject to project-specific CEQA reviews of their own. Many activities resulting from the Proposed Amendments relating to the transportation and production of increased fuel production would take place at existing facilities; however, long-term operational related activities associated with deliveries and distribution of goods (e.g., alternative fuels) could result in the addition of new trips, which could increase regional VMT to a significant level.

Therefore, long-term operational-related effects to transportation and traffic would be significant.

Potential transportation impacts could be reduced to a less-than-significant level by mitigation measures prescribed by local, state, federal, or other land use or permitting agencies (either in the U.S. or abroad) with approval authority over the particular development projects. However, because CARB has no land use authority, mitigation is not within its purview to reduce significant impacts to less-than-significant levels.

Mitigation Measure 17-2

The Regulatory Setting in Attachment A includes applicable laws and regulations regarding transportation. CARB does not have the authority to require implementation of mitigation related to increases in VMT; these must be addressed 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. 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. The following recognized practices are routinely required to avoid and/or minimize transportation impacts:

- Identify and implement road and intersection design requirements or improvements for any project that would significantly impact the safety of roads and intersections.
- Consult with and implement recommendations from local fire protection services regarding emergency access requirements.
- Prepare transportation demand management plans that prioritize and promote use of non-automobile forms of transportation to minimize significant increases in VMT.

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 EIA 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 significant impacts. Although unlikely after implementation of Mitigation Measure 17-2, it is possible that significant impacts on transportation and traffic resources could still occur.

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 EIA takes the conservative approach in its post-mitigation significance conclusion and discloses, for CEQA compliance purposes, that long-term operational-related effects to transportation and traffic associated with the Proposed Amendments would remain **significant and unavoidable**.

18. Tribal Cultural Resources

Impact 18-1: Short-Term Construction-Related and Long-Term Operational Impacts on Tribal Cultural Resources

Consistent with the requirements of AB 52, on August 31, 2023, CARB issued letters to tribes that requested formal notice. Specifically, CARB issued letters to the Cachil Dehe Band of Wintun Indians of the Colusa Indian Community, Mechoopda Indian Tribe of Chico Rancheria, Viejas Band of Kumeyaay Indians, Yuhaaviatam of San Manuel Nation, Gabrieleno/Tongva San Gabriel Band of Mission Indians, and Ohlone/Costanoan-Esselen Nation. No requests for consultation were received.

Reasonably foreseeable compliance responses associated with the Proposed Amendments include the following responses, which could result in changes to the existing physical environment: modifications to cultivation volume and transport of feedstock; changes to location and types of feedstock; new or modified processing facilities for feedstock and finished fuel production; increased transportation of finished alternative fuels to blending terminals or retail fuel sites; construction and operation of new facilities to produce renewable diesel, renewable gasoline, AJF, and renewable propane; construction of biomass gasification and pyrolysis systems for hydrogen and renewable natural gas production; construction of new anaerobic facilities to digest manure from dairies, sewage from wastewater treatment plants, and organic waste diverted from landfills; construction of infrastructure to collect biogas and produce methane; construction of stand-alone and bolt-on cellulosic processing units for renewable fuels production; increase in collection of yard waste or removal of forest litter and agricultural residues; construction of electrolysis units and substitution of renewable natural gas for fossil gas in production of hydrogen; construction of solar and wind electricity generation projects; modification to existing or new industrial facilities to capture CO_2 emissions; construction of new infrastructure such as pipelines, wells and other surface facilities; construction and operation of additional refueling hydrogen stations and EV charging stations; modifications to electricity distribution and transmission infrastructure; modifications to existing crude production facilities to accommodate solar and wind electricity, solar heat, and/or solar steam generation; electrification of equipment and installation of renewable electricity and battery storage systems at petroleum refineries and alternative fuel production facilities; expansion of public transit systems; and land use changes and changes to fuel-associated shipment patterns.

Tribal cultural resources (TCRs) include sites, features, places, cultural landscapes, sacred places, and objects with cultural value to a California Native American tribe. The Proposed Amendments could result in construction of manufacturing facilities, production facilities, emission testing facilities, power plants, solar fields, wind turbines, other electricity generation facilities, and infrastructure that would require ground disturbance. In general, construction and ground disturbance activities would occur in areas of compatible zoning (e.g., agricultural). Regardless, there is a possibility that these activities may occur in or adjacent to a region consisting of known significant TCRs. Therefore, it is foreseeable that known or undocumented TCRs could be unearthed or otherwise discovered during ground-disturbing and construction activities.

Operation of facilities and infrastructure would not result in additional ground disturbance beyond that which occurred during construction and modification because operation activities would occur within the footprint of the constructed or modified facility. Therefore, most operational activities would not have the potential to affect TCRs. The presence of new facilities and infrastructure may, however, change the visual setting of the surrounding area, which could adversely affect tribal cultural resources, as determined by a California Native American Tribe. As a result, operation impacts would be significant.

Therefore, short-term construction-related and long-term operational-related impacts on TCRs associated with implementation of the Proposed Amendments would be significant.

Potential impacts to TCRs could be reduced to a less-than-significant level by mitigation measures prescribed by local, state, federal, or other land use or permitting agencies (either in the U.S. or abroad) with approval authority over the particular development projects. However, because CARB has no land use authority, mitigation is not within its purview to reduce significant impacts to less-than-significant levels.

Mitigation Measure 18-1

The Regulatory Setting in Attachment A includes applicable laws and regulations that relate to TCRs. CARB 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. The following recognized practices are routinely required to avoid and/or minimize impacts on TCRs:

- Proponents of construction activities implemented as a result of reasonably foreseeable compliance responses associated with the Proposed Amendment

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 impacts on TCRs associated with the project.
- Actions required to mitigate potentially significant TCRs impacts may include the following; however, any mitigation specifically required for a modified facility would be determined by the local lead agency.
- Retain the services of TCRs 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.
- Follow notification procedures and conduct consultation as required with California Native American Tribes under AB 52 (including PRC Section 21080.3.1 and 21080.3.2.). Provide notice to Native American Tribes of project details to identify potential TCRs. In the case that a TCR is identified, consistent with PRC Section 21084.3(b), prepare mitigation measures that:
  - Avoid and preserve the resource in place,
  - Treat the resource with culturally appropriate dignity,
  - Employ permanent conservation easements, and
  - Protect the resource.
- Regulated entities shall consult with lead agencies early in the planning process to identify the potential presence of cultural properties. The agencies shall 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.

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 EIA 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 significant impacts. Although

unlikely after implementation of Mitigation Measure 18-1, it is possible that significant impacts on TCRs could still occur.

Consequently, while impacts could likely be reduced to a less-than-significant level with mitigation measures imposed by the land use and/or permitting agencies acting as lead agencies for these individual projects under CEQA, if and when a project proponent seeks a permit for compliance-response related project, this ~~Draft~~ Final EIA 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 TCRs associated with the Proposed Amendments would remain **significant and unavoidable**.

19. Utilities and Service Systems

Impact 19-1: Long-Term Operational-Related Impacts to Utilities and Service Systems

Reasonably foreseeable compliance responses associated with the Proposed Amendments include the following responses, which could result in changes to the existing physical environment: modifications to cultivation volume and transport of feedstock; changes to location and types of feedstock; new or modified processing facilities for feedstock and finished fuel production; increased transportation of finished alternative fuels to blending terminals or retail fuel sites; construction and operation of new facilities to produce renewable diesel, renewable gasoline, AJF, and renewable propane; construction of biomass gasification and pyrolysis systems for hydrogen and renewable natural gas production; construction of new anaerobic facilities to digest manure from dairies, sewage from wastewater treatment plants, and organic waste diverted from landfills; construction of infrastructure to collect biogas and produce methane; construction of stand-alone and bolt-on cellulosic processing units for renewable fuels production; increase in collection of yard waste or removal of forest litter and agricultural residues; construction of electrolysis units and substitution of renewable natural gas for fossil gas in production of hydrogen; construction of solar and wind electricity generation projects; modification to existing or new industrial facilities to capture CO_2 emissions; construction of new infrastructure such as pipelines, wells and other surface facilities; construction and operation of additional refueling hydrogen stations and EV charging stations; modifications to electricity distribution and transmission infrastructure; modifications to existing crude production facilities to accommodate solar and wind electricity, solar heat, and/or solar steam generation; electrification of equipment and installation of renewable electricity and battery storage systems at petroleum refineries and alternative fuel production facilities; expansion of public transit systems; and land use changes and changes to fuel-associated shipment patterns.

Reasonably foreseeable compliance responses associated with the Proposed Amendments could result in new demand for water, wastewater, electricity, and gas services. Generally, facilities would be cited in areas with existing utility infrastructure or

areas where existing utility infrastructure is easily accessible. 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, no matter their 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 wastewater 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.

The implementation of the Proposed Amendments is expected to increase the production of biomethane from dairy digesters. Some dairy and livestock operations may transport raw or minimally processed biogas via underground pipelines or with trucks to centralized upgrading and compression facilities for injection into the common carrier natural gas pipeline network. Alternatively, collected manure could be transported to centralized digesters and potentially co-digested with other feedstocks (such as food waste) for increased fuel production. This would be feasible at large dairies in close proximity to one another that collectively could connect to a natural gas pipeline at lower cost than could occur individually. Implementation of digesters and associated equipment could provide small-scale electricity production, distributing biogas via pipeline and providing fuel for on- or off-site vehicle fleets. Digesters typically include flares, which are intended for emergency purposes and would not be expected to be used on a regular basis, if ever.

Development of off-site centralized dairy digester facilities could require new water and wastewater treatment facilities or connection to a municipal system. Water would be required to increase the liquid content of manure feedstock, as well as to water down the resulting effluent in some cases; however, this water could be non-potable. Digesters located near dairy facilities could be supplied by groundwater or irrigation districts; digesters within the urban fringe would be supplied by a municipal source. Construction of new or expanded storm water drainage facilities could also result from

the development of off-site digesters. The operation of digester systems at dairies, organic compost facilities, and wastewater treatment plants designed to export electricity or biogas for off-site use or consumption could potentially create impacts for electric and gas utilities and their service systems. The export or injection of digester-derived biogas into natural gas pipeline systems would require interconnection infrastructure with local utility-owned pipeline systems and would require biogas upgrading to meet the constituency standards and heating values of their pipeline systems. Thus, long-term operational impacts on utilities and services systems, associated with the Proposed Amendments would be significant.

Implementation of the Proposed Amendments would also likely increase the production of hydrogen via electrolysis. Electrolysis is a process that uses electricity to split water into hydrogen molecules. In addition, new hydrogen pipelines could be constructed to transport hydrogen from the production facilities to end-uses, and could potentially be operated by utilities. Long-term operational impacts on utilities and service systems associated with the Proposed Amendments would be significant with regard to hydrogen production and transport.

As discussed in Section 4.B.2, impacts to agricultural resources, the Proposed Amendments would result in increased agricultural activities relating to production of alternative fuels. New and expanding agricultural activities would potentially result in increased demand on utility and service systems. Because the LCFS program is market-driven, it is not possible to determine the exact locations where these feedstocks may be cultivated. The amount of increased demand on utilities required to produce enough biofuel to meet projected demand depends entirely on the productivity of a given feedstock on a given parcel of land. Feedstocks may be sourced from forest and agricultural lands and would be dependent on available quantities and location of processing facilities. However, because the Proposed Amendments would provide incentives that could lead to an increase in the production of certain agricultural feedstocks to produce low-carbon biofuels, and because such an increase could contribute to potential increase in utilities and service systems changes, this impact would be significant.

Potential utility impacts could be reduced to a less-than-significant level by mitigation measures prescribed by local, state, federal, or other land use or permitting agencies (either in the U.S. or abroad) with approval authority over the particular development projects. However, because CARB has no land use authority, mitigation is not within its purview to reduce significant impacts to less-than-significant levels.

Mitigation Measure 19-1

The Regulatory Setting in Attachment A includes applicable laws and regulations that relate to utilities and service systems. CARB 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 measures would be identified during the environmental review by agencies with project-approval authority. The following recognized practices are routinely required to avoid and/or minimize utility and service-related impacts:

- Proponents of new or modified facilities constructed because 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 would certify that the environmental document was prepared in compliance with applicable regulations and would approve the project for development.
- Based on the results of the environmental review, proponents would implement all mitigation identified in the environmental document to reduce or substantially lessen potentially significant impacts on utilities and service systems. The definition of 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 PRC Section 21151.9 and 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 level of analysis associated with this ~~Draft~~ Final EIA 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 significant impacts. Although unlikely after implementation of Mitigation Measure 19-1, it is possible that significant impacts on utilities and service systems could still occur.

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 EIA takes the conservative approach in its post-mitigation significance conclusion and discloses, for CEQA compliance purposes, long-term operational-related effect to utilities and service systems associated with the Proposed Amendments would remain **significant and unavoidable**.

20. Wildfire

Impact 20-1: Short-Term Construction-Related and Long-Term Operational-Related Impacts on Wildfire

Reasonably foreseeable compliance responses associated with the Proposed Amendments include the following responses, which could result in changes to the existing physical environment: modifications to cultivation volume and transport of feedstock; changes to location and types of feedstock; new or modified processing facilities for feedstock and finished fuel production; increased transportation of finished alternative fuels to blending terminals or retail fuel sites; construction and operation of new facilities to produce renewable diesel, renewable gasoline, AJF, and renewable propane; construction of biomass gasification and pyrolysis systems for hydrogen and renewable natural gas production; construction of new anaerobic facilities to digest manure from dairies, sewage from wastewater treatment plants, and organic waste diverted from landfills; construction of infrastructure to collect biogas and produce methane; construction of stand-alone and bolt-on cellulosic processing units for renewable fuels production; increase in collection of yard waste or removal of forest litter and agricultural residues; construction of electrolysis units and substitution of renewable natural gas for fossil gas in production of hydrogen; construction of solar and wind electricity generation projects; modification to existing or new industrial facilities to capture CO_2 emissions; construction of new infrastructure such as pipelines, wells and other surface facilities; construction and operation of additional refueling hydrogen stations and EV charging stations; modifications to electricity distribution and transmission infrastructure; modifications to existing crude production facilities to accommodate solar and wind electricity, solar heat, and/or solar steam generation; electrification of equipment and installation of renewable electricity and battery storage systems at petroleum refineries and alternative fuel production facilities; expansion of public transit systems; and land use changes and changes to fuel-associated shipment patterns.

In the event of an emergency, such as a wildfire, evacuation coordination is dealt with at various levels of government through local, state, or federal agencies as appropriate. The California Department of Forestry and Fire Protection (CAL FIRE) is responsible for coordinating wildfire response and protection within State Responsibility Areas. CAL FIRE does not have responsibility for fire response in Local Responsibility Areas or Federal Responsibility Areas, which are defined based on land ownership, population density, and land use. These areas include densely populated areas, such as cities and

towns; agricultural lands; and lands administered by the federal government. In densely populated areas, local fire departments respond to fires and emergencies. Fire response on federal lands is coordinated by the appropriate federal agency. For example, on National Forest System lands, the U.S. Forest Service coordinates fire response; on lands administered by the U.S. Bureau of Land Management (BLM), BLM coordinates fire response.

Facilities and associated infrastructure, such as facilities for the use of low-CI fuels would be constructed and operated within response areas for various jurisdictions and would be dealt with in the same manner as existing infrastructure. Construction and operation activities as well as new or modified facilities would likely occur within footprints of existing manufacturing facilities, or in areas with appropriate zoning that permit such uses and activities; therefore, changes or modifications to existing fire response and evacuation plans would not be necessary. Likewise, the small increase in use at recycling facilities would occur at existing facilities that are already under an assigned jurisdiction for fire safety. As discussed under Impact 14-1, compliance responses implemented under the Proposed Amendments would not create growth substantial enough to impede emergency response or affect evacuation route capacity.

Therefore, implementation of the Proposed Amendments would have a **less than significant** short-term construction-related and long-term operational impact on wildfire.

This page intentionally left blank.

5.0 Cumulative and Growth-Inducing Impacts

A. Approach to Cumulative Analysis

This chapter satisfies the requirement of the CEQA to discuss how the project being analyzed would contribute to cumulative impacts. CARB's certified regulatory program (Title 17 CCR Sections 60000–60008) does not provide specific direction on a cumulative impacts analysis, and while CARB is exempt from Chapters 3 and 4 of CEQA and corresponding sections of the CEQA Guidelines by virtue of its certified program, the Guidelines nevertheless contain useful guidance for preparation of a thorough and meaningful cumulative analysis. The CEQA Guidelines require a lead agency to discuss a cumulative impact if the project's incremental effect combined with the effects of other projects is "cumulatively considerable" (Title 14 CCR Section 15130[a]). The discussion of cumulative impacts need not provide as much detail as the discussion of effects attributable to the project alone (Title 14 CCR Section 15130). Where a lead agency is examining a project with an incremental effect that is not "cumulatively considerable," a lead agency need not consider that effect significant but must briefly describe its basis for concluding that the incremental effect is not cumulatively considerable.

As noted in Chapter 4.0, above, the Proposed Amendments would result in significant and unavoidable impacts with respect to aesthetics, agricultural and forestry resources, air quality, biological resources, cultural resources, energy, geology and soils, hazards and hazardous materials, hydrology and water quality, mineral resources, land uses, noise, transportation, tribal cultural resources (TCRs), and utilities and service systems. These impacts are primarily attributed to the potential increase in construction and operation facilities and infrastructure to support increased production and use of renewable and low-carbon-intensity (CI) fuels production and feedstock production.

In considering cumulative impacts, an agency may choose from two approaches: It can prepare a list of past, present, and probable future projects that produce or would produce related or cumulative impacts, or it can rely on a summary of projections contained in an adopted planning document or an adopted or certified environmental document for the planning document (Title 14 CCR Section 15130[b]). Further, the CEQA Guidelines state that the pertinent discussion of cumulative impacts contained in one or more previously certified environmental impact reports (EIRs) may be incorporated by reference pursuant to provisions for tiering and program EIRs, and that no future cumulative analysis is required when the lead agency determines the regional and areawide impacts have already been addressed in the prior certified EIR for that plan (Title 14 CCR Section 15130).

This cumulative impact analysis uses the "summary of projections" approach set forth in Title 14 CCR Section 15130(b)(1)(B), using the 2022 Scoping Plan for Achieving Carbon Neutrality's (2022 Scoping Plan Update's) lists of actions, which consist of other similar statewide air quality and GHG reduction measures. The 2022 Scoping Plan Update's

objectives and reasonably foreseeable compliance responses align with those brought forward in this EIA.

Because of the statewide reach of the Proposed Amendments and the longer-term future horizon for achievement of emission reductions, the impact analyses for the resource topics in Chapter 4.0 are programmatic, rather than site or project specific, to address the statewide context. The document contains a description and analysis of a series of actions that are part of one large program. Recommended mitigation measures in Chapter 4.0 provide a series of generally recognized methods to reduce significant impacts but cannot offer details related to specific project locations. As a result, the impact conclusions and mitigation measures in the resource-oriented sections of Chapter 4.0 are cumulative by nature, because they describe the potential impacts associated collectively with the full range of reasonably foreseeable compliance responses.

Like the analysis presented in Chapter 4.0 of this ~~Draft~~ Final EIA, the cumulative impacts analysis is described at a necessarily general level of detail, because information related to specific actions is not known at this time. This approach to a cumulative impacts analysis is "guided by the standards of practicality and reasonableness" (14 CCR Section 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" (*Communities for a Better Environment [CBE] v. the California Resources Agency* [2002] 103 Cal.App.4th 98, 119).

B. Projects Resulting in Related Impacts

The CEQA Guidelines state that a previously approved plan for the reduction of criteria and other air pollutant emissions (e.g., GHGs) may be used in cumulative impacts analysis; that the pertinent discussion of cumulative impacts contained in one or more previously certified EIRs may be incorporated by reference (Title 14 CCR Section 15130[d]). Furthermore, no further cumulative impacts analysis is required when a project is consistent with a general, specific, master, or comparable programmatic plan where the lead agency determines that the regional or areawide cumulative impacts of a proposed project have already been adequately addressed, as defined in Section 15152(f), in a certified EIR for that plan (14 CCR Section 15130[d]). CEQA further directs that a tiered EIR focus on significant environmental effects that were not already analyzed in the previous environmental analysis. (PRC Sections 21068.5, 21093; see also Section 21094[c].)

Additional community-level strategies to reduce emissions and exposure, beyond the existing efforts, focus on amending current State measures and implementing new State measures. For purposes of disclosure and broad consideration of the potential actions that address air quality, CARB has identified relevant projects that would result

in related impacts. Related projects consist of the 2022 Scoping Plan Update,[92] which contains measures that reduce air pollutant and GHG emissions and exposure within communities across the State.

As noted above, the CEQA Guidelines allow for incorporating by reference 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 (14 CCR Section 15150). Therefore, the following document is incorporated by reference:

- Final Environmental Assessment (EA) for the 2022 Scoping Plan Update[93]

The portions of the document relevant to this discussion are summarized below and within the respective resource area analyses. The document is available upon request from CARB and online here:

- https://ww2.arb.ca.gov/sites/default/files/2022-12/2022-sp-appendix-b-final-environmental-analysis.pdf

1. 2022 Scoping Plan Update

In 2016, the California Legislature passed SB 32, which mandates that the State reduce GHG emissions to 40% below 1990 levels by 2030. This target was expanded upon in 2022 with the passage of AB 1279, which established new long-term GHG reduction targets of reducing statewide anthropogenic emissions by 85% from 1990 levels and achieving carbon neutrality by no later than 2045. In December 2022, CARB approved the 2022 Scoping Plan Update, which provides the framework for achieving the ambitious target of achieving statewide carbon neutrality by 2045 and the 85% GHG reduction target.

Implementation of the measures to achieve the 2022 target in the Scoping Plan Update would result in two main types of reasonably foreseeable compliance responses: (1) construction of, or modifications to buildings, infrastructure, and industrial facilities and (2) new operations or changes to existing operational processes. These compliance responses are discussed in more detail below.

---

[92] California Air Resources Board, *2022 Scoping Plan for Achieving Carbon Neutrality*. November 16, 2022. *https://ww2.arb.ca.gov/sites/default/files/2022-12/2022-sp.pdf*

[93] California Air Resources Board, *Final Environmental Analysis for the 2022 Scoping Plan for Achieving Carbon Neutrality*. December 13, 2022. *https://ww2.arb.ca.gov/sites/default/files/2022-12/2022-sp-appendix-b-final-environmental-analysis.pdf*

a) Construction of, or Modifications to, Buildings, Infrastructure, and Industrial Facilities

Implementation of the 2022 Scoping Plan Update would result in various construction projects. These projects would include infrastructure projects, such as natural gas and hydrogen refueling stations; collection, processing, and distribution of biomethane; wind, solar thermal, solar photovoltaic, geothermal, solid-fuel biomass, biogas, and small hydroelectric to generate electricity (i.e., renewable energy projects); collection of natural gas from landfills, dairies, and wastewater treatment plants; modifications to crude production facilities (on-site solar, wind, heat, and/or steam generation electricity); organic material composting and/or digesting facilities that would convert organic wastes diverted from landfills (e.g., yard waste, green wastes, food); vehicle fueling (e.g. renewable natural gas); vehicle charging stations; and upgraded and new transmission lines. Modifications may also be necessary at industrial sources in compliance with the Cap-and-Trade Program; roadways and urban areas to reduce overall vehicle miles traveled; and oil and gas facilities (which may include modifications to existing facilities, pipeline replacement or reconstruction activities, inspection and monitoring, and disposal of methane vapors). In addition, manufacturing facilities may be necessary to produce lithium-ion batteries. Large-scale energy storage systems would also be installed throughout California, which would reduce energy production demands.

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. Demolition of existing structures may also occur before the construction of new buildings and structures. Construction activities can be short-term and long-term. That is, after construction of a building is completed, it will stay on a project site until demolished or otherwise removed.

b) New Operations and Changes to Existing Operational Processes

Under the 2022 Scoping Plan Update, there would be various methods to reduce GHG emissions that would result in new operations or changes to existing operational processes. New operations could include increased mining for lithium and increased recycling or refurbishment of batteries for on-road light-duty vehicles and heavy-duty vehicles. New operations would also include changes to methods of manure management at dairies, alterations to crop cultivation to meet feedstock demands related to fuels regulations, and improvements to transportation systems to reduce reliance on personal vehicles.

Potential environmental impacts associated with the 2022 Scoping Plan Update are summarized below in Table 6.

Table 6: Summary of Environmental Impacts for the 2022 Scoping Plan Update[94]

Resource Areas and Impact Categories	Significance Determination
Aesthetics	
Impact 1.a: Short-Term Construction-Related Impacts	PSU
Impact 1.b: Long-Term Operational-Related Impacts	PSU
Agriculture and Forest Resources	
Impact 2.a: Short-Term Construction-Related Impacts	PSU
Impact 2.b: Long-Term Operational-Related Impacts	PSU
Air Quality	
Impact 3.a: Short-Term Construction-Related Impacts	PSU
Impact 3.b: Long-Term Operational-Related Impacts	B
Biological Resources	
Impact 4.a: Short-Term Construction-Related Impacts	PSU
Impact 4.b: Long-Term Operational-Related Impacts	PSU
Cultural Resources	
Impact 5.a: Short-Term Construction-Related and Long-Term Operational-Related Impacts	PSU
Energy Demand	
Impact 6.a: Short-Term Construction-Related Impacts	LTS
Impact 6.b: Long-Term Operational-Related Impacts	LTS
Geology and Soils	
Impact 7.a: Short-Term Construction-Related Impacts	PSU
Impact 7.b: Long-Term Operational-Related Impacts	PSU
Greenhouse Gas	
Impact 8.a: Short-Term Construction-Related and Long-Term Operational-Related Impacts	B

[94] California Air Resources Board, *Final Environmental Analysis for the 2022 Scoping Plan for Achieving Carbon Neutrality*. December 13, 2022. *https://ww2.arb.ca.gov/sites/default/files/2022-12/2022-sp-appendix-b-final-environmental-analysis.pdf*

Resource Areas and Impact Categories	Significance Determination
Hazards and Hazardous Materials	
Impact 9.a: Short-Term Construction-Related Impacts	PSU
Impact 9.b: Long-Term Operational-Related Impacts	PSU
Hydrology and Water Quality	
Impact 10.a: Short-Term Construction-Related Impacts	PSU
Impact 10.b: Long-Term Operational-Related Impacts	PSU
Land Use and Planning	
Impact 11.a: Short-Term Construction-Related Impacts	PSU
Impact 11.b: Long-Term Operational-Related Impacts	PSU
Mineral Resources	
Impact 12.a: Short-Term Construction-Related and Long-Term Operational-Related Impacts	LTS
Noise	
Impact 13.a: Short-Term Construction-Related Impacts	PSU
Impact 13.b: Long-Term Operational-Related Impacts	PSU
Population and Housing	
Impact 14.a: Short-Term Construction-Related and Long-Term Operational-Related Impacts	LTS
Public Services	
Impact 15.a: Short-Term Construction-Related and Long-Term Operational-Related Impacts	LTS
Recreation	
Impact 16.a: Short-Term Construction-Related Impacts	LTS
Impact 16.b: Long-Term Operational-Related Impacts	PSU
Transportation/Traffic	
Impact 17.a: Short-Term Construction-Related Impacts	PSU
Impact 17.b: Long-Term Operational-Related Impacts	PSU
Tribal Cultural Resources	
Impact 18.a: Short-Term Construction-Related and Long-Term Operational-Related Impacts	PSU

Resource Areas and Impact Categories	Significance Determination
Utilities and Service Systems	
Impact 19.a: Long-Term Operational-Related Impacts	PSU
Wildfire	
Impact 20.a: Short-Term Construction-Related Impacts	PSU
Impact 20.b: Long-Term Operational-Related Impacts	PSU

- B = Beneficial; LTS = Less Than Significant; NA = Not Applicable; PSU = Potentially Significant and Unavoidable

C. Significance Determinations and Mitigation

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 2022 Scoping Plan Update EA considers cumulative impacts of a full range of reasonably foreseeable compliance responses to all the recommendations and considered the cumulative effect of other "closely related" past, present, and future reasonably foreseeable activities undertaken to address air quality at the state level, as well as other activities with "related impacts" (Title 14 CCR Sections 15355[b] and 15130[a][1]).

The analysis of the EA is hereby incorporated by reference. Portions of the Final EA relevant to this discussion are also summarized below. The analysis of cumulative impacts includes:

- A summary of the cumulative impacts found for each resource area in the 2022 Scoping Plan Update EA;
- A discussion of the types of compliance responses associated with the Proposed Regulation, pertinent to each resource area; and
- A significance conclusion that determines if the Proposed Regulation could result in a significant cumulative effect or a considerable contribution to an existing significant cumulative impact.

This approach to cumulative impacts analysis is "guided by the standards of practicality and reasonableness" (Title 14 CCR Section 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).

Implementation of the Proposed Amendments 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 those other agencies would implement the mitigation measures, which precludes assurance that significant impacts would be avoided or reduced to a less-than-significant level. Where impacts cannot feasibly be mitigated or where there is uncertainty about implementation of mitigation, this ~~Draft~~ Final EIA 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 Proposed Amendments as part of the approval process.

D. Cumulative Impacts by Resource Area

1. Aesthetics

The 2022 Scoping Plan Update EA found that implementation of the recommended actions within the various sectors, which included the recommendation for the Proposed Amendments, could result in a significant cumulative impact to aesthetic resources from construction and operational activities associated with new or modified facilities or infrastructure. As discussed in the 2022 Scoping Plan Update EA, there is uncertainty as to the exact location of these new facilities or the modification of existing facilities. Construction and operation of these facilities (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 State scenic highways. The visual impact of such development would depend on several variables, including the type and size of facilities, distance and angle of view, visual absorption and placement in the landscape. In addition, facility operation may introduce substantial sources of glare, exhaust plumes, and nighttime glare from lighting for safety and security purposes. Implementation of mitigation measures would not reduce these impacts to a less-than-significant level because the authority to determine project-level impacts and require project-level mitigation lies with land use and/or permitting agencies for individual projects. Thus, implementation of the recommended actions in the 2022 Scoping Plan Update, which includes Proposed Amendments, could result in a significant cumulative aesthetics-related impact.

The Proposed Amendments' contribution to this significant impact would be cumulatively considerable, given the conclusion in Chapter 4.0 that the Proposed Amendments may themselves result in a significant adverse impact on aesthetic resources, consistent with the findings of the 2022 Scoping Plan Update EA. Implementation of the identified project-level mitigation could effectively reduce the incremental contribution from the Proposed Amendments to a less-than-considerable level, but authority to require that mitigation would rest with other agencies that would be authorizing site-specific projects, and not with CARB. Thus, the Proposed Amendments **could result in a cumulatively considerable contribution to a significant cumulative impact** on aesthetic resources.

2. Agriculture and Forestry Resources

The 2022 Scoping Plan Update EA found that implementation of the recommended measures within the various sectors, which included the recommendation for the Proposed Amendments, could result in a significant cumulative impact to agricultural and forest resources. As discussed in the 2022 Scoping Plan Update EA, there is uncertainty as to the exact location of these new facilities or the modification of existing facilities. Construction of new facilities could result in the conversion of Prime Farmland, Unique Farmland, or Farmland of Statewide Importance, Williamson Act conservation contracts, or forest land or timberland, resulting in the loss of these resources. Additionally, increased demand for feedstock for fuels could result in indirect land use changes where food-based agriculture could shift to other areas and increase pressure to convert rangeland, grassland, forests, and other uses to agriculture. Because CARB has no land use authority, mitigation is not within its purview to reduce significant impacts to less-than-significant levels. Compliance with existing land use policies, ordinances, and regulations would serve to minimize this impact. Land use impacts would be further addressed for individual projects through the local development review process. Mitigation measures were identified that could reduce these impacts that would be applied through the development review process. However, 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 because of the programmatic nature of the EA, impacts were determined to be significant and unavoidable. Thus, the 2022 Scoping Plan Update, which includes Proposed Amendments, could result in a significant cumulative impact to agricultural and forest resources.

The Proposed Amendments' contribution to this significant impact would be cumulatively considerable, given the conclusion in Chapter 4.0 that the Proposed Amendments may themselves result in a significant adverse impact on agricultural and forest resources as concluded in the 2022 Scoping Plan Update. Mitigation measures were identified that could reduce these impacts that would be applied through the development review process. However, 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 because of the programmatic nature of this ~~Draft~~ Final EIA, impacts were determined to be significant and unavoidable. Thus, the Proposed Amendments **could result in a cumulatively considerable contribution to a significant cumulative impact** on agricultural and forest resources.

3. Air Quality

The 2022 Scoping Plan Update EA found that implementation of the recommended measures within the various sectors, which included the recommendation for the Proposed Amendments, could result in a significant cumulative impact to short-term construction-related air quality. As discussed in the 2022 Scoping Plan Update EA, reasonably foreseeable compliance responses associated with the Proposed Amendments could result in short-term construction-related increases in criteria air

pollutants and toxic air contaminants (TACs) in proximity to where fuel production or handling facilities are constructed or modified, as well as generate unpleasant odors that could affect sensitive receptors. These would be generated from using heavy-duty construction equipment on a short-term basis. Therefore, the construction-related activities in response to the Proposed Amendments could generate emission levels that conflict with applicable air quality plans, result in a cumulatively considerable net increase in non-attainment areas or expose sensitive receptors to substantial pollutant concentrations or odors. However, all projects, no matter their size or type would be required to seek local or state land use approvals prior to their implementation. Part of the land use entitlement process in California requires that each of these projects undergo environmental review consistent with California environmental review requirements (e.g., CEQA) and other applicable local requirements (e.g., local air district rules and regulations). This environmental review process would assess whether project implementation would result in short-term construction-related air quality impacts.

CARB identified mitigation measures that could reduce these impacts with the intention that the mitigations be applied through the development review process. However, 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 because of the programmatic nature of the EIA, short-term construction-related air quality impacts were determined to be significant and unavoidable. For more detailed discussion on mitigating air quality impacts via project-specific review, see Chapter 4.0. Thus, the 2022 Scoping Plan Update, which includes the Proposed Amendments, could result in a short-term, construction-related cumulatively considerable impact to air quality.

The Proposed Amendments' contribution to this significant impact would be cumulatively considerable, given the conclusion in Chapter 4.0 that the proposed regulations may themselves result in a significant adverse short-term construction related impacts on air quality. Mitigation measures were identified that could reduce these impacts that would be applied through the development review process. However, 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 because of the programmatic nature of this ~~Draft~~ Final EIA, impacts were determined to be significant and unavoidable. Thus, the Proposed Amendments **could result in a cumulatively considerable contribution to a significant cumulative short-term construction related impact** on air quality.

Overall, while there would be some operational criteria air pollutant emissions and TACs associated with the 2022 Scoping Plan Update, in the long term the measures would result in beneficial operational impacts. Therefore, the 2022 Scoping Plan Update would not have a cumulatively considerable impact on operational air quality.

As discussed above in chapter 4.0, CARB does not believe significant localized increases are likely, and anticipates overall beneficial long-term operational impacts statewide. Nevertheless, in an abundance of caution and for the purposes of complete public disclosure, CARB concludes that long-term local air quality impacts associated with the Proposed Amendments could be potentially significant and unavoidable. Thus, implementation of the Proposed Amendments **could result in a cumulatively considerable contribution to a significant cumulative long-term operational-related impact** on air quality.

Implementation of the Proposed Amendments would encourage the collection of natural gas from dairies, landfills, and wastewater treatment plants. Generally, odor is considered a perceived nuisance and an environmental impact. Factors that would affect odor impacts include the design of collection facilities and exposure duration. In general, odors associated with dairies, landfills, and wastewater treatment plants are part of the existing conditions baseline and are likely to be reduced using a closed system (e.g., digester facilities). In addition, odor impacts are site-specific, and the gaseous compounds released during operations would be distributed into the atmosphere in a way that would not allow for combined effects.

Thus, implementation of the Proposed Amendments **would not result in a cumulatively considerable contribution to a significant cumulative impact** related to odors.

4. Biological Resources

Implementation of reasonably foreseeable compliance responses associated with recommended measures in the 2022 Scoping Plan Update, which included the recommendation for Proposed Amendments, could require construction and operational activities associated with new or modified facilities or infrastructure. There is uncertainty as to the exact location of these new facilities or the modification of existing facilities. Construction 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. These activities would have the potential to adversely affect biological resources (e.g., species, habitat) that may reside or be present in those areas. Because there are biological species that occur, or even thrive, in developed settings, resources could also be adversely affected by construction and operations within disturbed areas at existing manufacturing facilities or at other sites in areas with zoning that would permit the development of manufacturing or industrial uses. In addition, new regulations could affect biological resources depending on the type of crop, location, and need to convert lands, habitat destruction could occur, resulting in the loss of biodiversity. The location of new crop lands may affect conservation plans or disrupt important migratory routes. Indirect effects could occur as well, such as increased pesticide and nutrient use, the runoff of which could be detrimental to individual species.

The biological resources that could be affected by construction and operation associated with implementation of new regulations and/or incentive measures under the Scoping Plan Update would depend on the specific location of any necessary construction and its environmental setting. Harmful 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. Implementation of mitigation measures would not reduce these impacts to a less-than-significant level. Thus, the 2022 Scoping Plan Update, which includes Proposed Amendments, could result in a significant cumulative impact on biological resources.

The Proposed Amendments' contribution to this significant impact would be cumulatively considerable, given the conclusion in Chapter 4.0 that the proposed regulations may themselves result in a significant adverse impact on biological resources. Implementation of mitigation measures would reduce these environmental effects. However, because the authority to determine activity-level impacts and require activity-level mitigation lies with land use and/or permitting agencies for individual projects, and the programmatic level of analysis associated with this ~~Draft~~ Final EIA does not attempt to address site-specific details of mitigation, there is inherent uncertainty in the degree of mitigation that may ultimately be implemented to reduce significant impacts.

Consequently, this ~~Draft~~ Final EIA takes the conservative approach in its post-mitigation significance conclusion and discloses, for CEQA compliance purposes, that construction-related and long-term operational impacts on biological resources could be significant and unavoidable. Thus, the Proposed Amendments **could result in a cumulatively considerable contribution to a significant cumulative impact** on biological resources.

5. Cultural Resources

Implementation of reasonably foreseeable compliance responses associated with the recommended actions in the 2022 Scoping Plan Update, which included the recommendation for Proposed Amendments, could require construction activities associated with new or modified facilities or infrastructure. There is uncertainty as to the exact location of these new facilities or the modification of existing facilities. 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 could include, but are not limited to, prehistoric and historical

archaeological sites, 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. Implementation of mitigation measures could reduce these impacts, however because the authority to determine specific project-level impacts and mitigation is outside the purview of CARB, any mitigation identified would not reduce these impacts to a less-than-significant level. Thus, the 2022 Scoping Plan Update, which includes Proposed Amendments, could result in a significant cumulative impact on cultural resources.

The Proposed Amendments' contribution to this significant impact would be cumulatively considerable, given the conclusion in Chapter 4.0 that the proposed regulations may themselves result in a significant adverse impact on cultural resources. 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 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 EIA takes the conservative approach in its post-mitigation significance conclusion and discloses, for CEQA compliance purposes, that the short-term construction-related impact on cultural resources **could result in a cumulatively considerable contribution to a significant cumulative impact** on cultural resources.

6. Energy

Implementation of reasonably foreseeable compliance responses associated with the recommended actions in the 2022 Scoping Plan Update, which included the recommendation for Proposed Amendments, could require construction and operational activities associated with new or modified facilities or infrastructure. Temporary increases in energy demand associated with new facilities would include fuels used during construction, and gas and electric operational 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 and would not result in sustained increases in demand that would adversely affect energy

supplies. Therefore, the Scoping Plan Update would not result in a cumulative short-term construction-related impact on energy demand.

The long-term operational energy demand impacts associated with the recommended actions under the 2022 Scoping Plan Update, which includes the Proposed Amendments, would be primarily beneficial. Therefore, the 2022 Scoping Plan Update would not result in a considerable contribution to a cumulative long-term operational impact on energy demand.

Implementation of reasonably foreseeable compliance responses associated with the Proposed Amendments could also require construction and operational activities associated with new or modified facilities or infrastructure as well as fuel production. While the Proposed Amendments could result in an increase in energy demand the energy use would not be wasteful, inefficient, or unnecessary and would not conflict with the 2022 Scoping Plan Update. Thus, the Proposed Amendments **would not result in a cumulatively considerable contribution to a significant cumulative impact** on energy demand.

7. Geology and Soils

Implementation of the reasonably foreseeable compliance responses associated with the recommended measures in the 2022 Scoping Plan Update, including Proposed Amendments, could require construction and operational activities associated with new or modified facilities or infrastructure. In addition, implementation of new fuels regulations could increase or change agricultural practices. The detrimental effects of agricultural practices on soil quality include erosion, desertification, salinization, compaction, and pollution. Loss of topsoil can increase erosion rates and affect water quality, which may be exacerbated through increased use of nutrients and pesticides.

There is uncertainty as to the exact location of these new facilities or the modification of existing facilities. Construction and operation could be located in a variety of relatively high-risk geologic and soil conditions that are considered to be potentially hazardous. For instance, the seismic conditions at the site of a new facility may have high to extremely high seismic-related fault rupture and ground shaking potential associated with earthquake activity. New facilities could also be subject to seismic-related ground failure, including liquefaction and landslides. Construction and operational activities could be located in a variety of geologic, soil, and slope conditions with varying amounts of vegetation that would be susceptible to soil erosion. Strong ground shaking could also trigger landslides in areas where the natural slope is naturally unstable or is over-steepened by the construction of access roads and structures. Construction and operation could also occur in locations that would expose facilities and structures to expansive soil conditions. Development of new facilities could be susceptible to the presence of expansive soils particularly in areas of fine-grained sediment accumulation typically associated with playas, valley bottoms, and local low-lying areas.

The specific design details, siting locations, seismic hazards, and geologic, slope, and soil conditions for any particular facilities that could occur as a result of reasonably foreseeable compliance responses are not known at this time and would be analyzed on a site-specific basis at the project level. Therefore, for purposes of this analysis, development of these facilities could expose people and structures to relatively high levels of risk associated with strong seismic ground shaking, including liquefaction and landslides, and instability. These geologic, seismic, and soil-related conditions could result in damage to structures, related utility lines, and access roads, blocking access and posing safety hazards to people.

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 since 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 significant impacts. Thus, the 2022 Scoping Plan Update, which includes Proposed Amendments, could result in a significant cumulative impact on geology and soils.

The Proposed Amendments' contribution to this significant impact would be cumulatively considerable, given the conclusion in Chapter 4.0 that the Proposed Amendments may themselves result in a significant adverse impact on geology and soils. 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 since 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 significant impacts. Thus, the Proposed Amendments **could result in a cumulatively considerable contribution to a significant cumulative impact** on geology and soils.

8. Greenhouse Gas Emissions

Implementation of reasonably foreseeable compliance responses associated with the recommended actions in the 2022 Scoping Plan Update, which includes Proposed Amendments, could require construction activities associated with new or modified facilities or infrastructure. Specific, project-related construction activities could result in increased generation of short-term GHG emissions in limited amounts associated with the use of heavy-duty off-road equipment, materials transport, and worker commutes. As described in Chapter 4.0, 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, and agencies generally recommended that GHG analyses focus on operational phase emissions, unless the project is of a unique nature requiring atypical (e.g., large scale, long-term) 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. Thus, short-term construction related GHG emissions impacts associated with reasonably foreseeable compliance responses for the recommended actions in the 2022 Scoping Plan Update would be less than significant when considered in comparison to the overall GHG reduction associated with implementation of the 2022 Scoping Plan Update.

The long-term operational impacts to GHG emissions from the recommended actions are primarily beneficial, consistent with the goals and objectives of the Scoping Plan Update to reduce emissions to achieve carbon neutrality and 2045 emission reduction goals.

Thus, the 2022 Scoping Plan Update, including Proposed Amendments, would not result in a cumulatively considerable contribution to a significant cumulative impact on GHG emissions.

Implementation of reasonably foreseeable compliance responses associated with the Proposed Amendments could require construction activities associated with new or modified facilities or infrastructure. Specific, project-related construction activities could result in increased generation of short-term GHG emissions in limited amounts associated with the use of heavy-duty off-road equipment, materials transport, and worker commutes. As described in Chapter 4.0, a majority of local agencies (e.g., air pollution control districts) do not recommend or require the quantification of short-term construction-generated GHG emissions 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, and agencies generally recommended that GHG analyses focus on operational phase emissions, unless the project is of a unique nature requiring atypical (e.g., large-scale, long-term) 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. Thus, short-term construction related GHG emissions impacts associated with reasonably foreseeable compliance responses to the Proposed Amendments would be less than significant when considered in comparison to the overall GHG reduction associated with implementation of the Proposed Amendments. Thus, the Proposed Amendments **would not result in a cumulatively considerable contribution to a significant cumulative impact** on GHG emissions.

9. Hazards and Hazardous Materials

Reasonably foreseeable compliance responses to the recommended measures in the 2022 Scoping Plan Update, which includes Proposed Amendments, could include construction and operation of new or modified facilities or infrastructure. There is uncertainty as to the exact locations where construction and operations of new facilities or the modification of existing facilities would occur.

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 remains for a significant release of hazardous materials into the environment. Consequently, 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. In addition, as discussed in Chapter 4.0, the operation of new and modified carbon capture and sequestration (CCS) facilities under the Proposed Amendments could result in the transport, use, and/or disposal of new or higher levels of hazardous chemicals compared to the baseline, depending on the type of facility and carbon capture system present. The Proposed Amendments' contribution to this significant impact would be cumulatively considerable, given the conclusion in Chapter 4.0 that the proposed regulations may themselves result in a significant adverse impact from hazards and hazardous materials. Implementation of mitigation measures would reduce these environmental effects. However, because the authority to determine activity-level impacts and require activity-level mitigation lies with land use and/or permitting agencies for individual projects, and the programmatic level of analysis associated with this ~~Draft~~ Final EIA does not attempt to address site-specific details of mitigation, there is inherent uncertainty in the degree of mitigation that may ultimately be implemented to reduce significant impacts.

Consequently, this EIA 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-related impacts from hazards and hazardous materials could be significant and unavoidable. Thus, the Proposed Amendments **could result in a cumulatively considerable contribution to a significant cumulative impact** on hazards and hazardous materials.

10. Hydrology and Water Quality

Construction activities and long-term operations associated with reasonably foreseeable compliance responses to the recommended measures in the 2022 Scoping Plan Update, which includes Proposed Amendments, could be in a variety of conditions with regards to altering drainage patterns, flooding, and inundation by seiche, tsunami, or mudflow. The level of susceptibility varies by location. In addition, fuels regulation could alter agricultural practices, resulting in discharges to waterways of sediment, nutrients, pathogens, pesticides, metals, and salts. The specific design details, siting locations, and associated hydrology and water quality issues are not known at this time and would

be analyzed on a site-specific basis at the project level. Therefore, for purposes of CEQA disclosure, these potential hydrology and water quality-related impacts could be significant. Implementation of mitigation measures to reduce these impacts would not reduce these impacts to a less-than-significant level because the authority to determine project-level impacts and require project-level mitigation lies with land use and/or permitting agencies for individual projects. Thus, the 2022 Scoping Plan Update, which includes Proposed Amendments, could result in a significant cumulative impact to hydrology and water quality.

The Proposed Amendments' contribution to this significant impact would be cumulatively considerable, given the conclusion in Chapter 4.0 that the proposed regulations may themselves result in a significant adverse impact on hydrology and water quality. Implementation of mitigation measures would reduce these environmental effects. However, because the authority to determine activity-level impacts and require activity-level mitigation lies with land use and/or permitting agencies for individual projects, and the programmatic level of analysis associated with this EIA does not attempt to address site-specific details of mitigation, there is inherent uncertainty in the degree of mitigation that may ultimately be implemented to reduce significant impacts.

Consequently, this ~~Draft~~ Final EIA 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 could be significant and unavoidable. Thus, the Proposed Amendments **could result in a cumulatively considerable contribution to a significant cumulative impact** on hydrology and water quality.

11. Land Use and Planning

Implementation of reasonably foreseeable compliance responses associated with the recommended actions in the 2022 Scoping Plan Update, which includes Proposed Amendments, could require both construction and long-term operation of new or modified facilities or infrastructure. There is uncertainty as to the exact location of these new facilities or the modification of existing facilities. However, facilities would likely occur within the footprints of existing manufacturing facilities, or in areas with zoning that would permit the development of these facilities. As summarized in Table 3, the 2022 Scoping Plan Update environmental document identified potentially significant and unavoidable impacts related to land use and planning due to construction of individual projects and significant and unavoidable impacts due to operation of individual projects. Thus, implementation of the 2022 Scoping Plan Update could result in a significant cumulative impact.

Because the Proposed Amendments on its own would result in a significant and unavoidable impact, and because this impact would combine with other land use impacts across the State, the project's contribution to the significant cumulative impact would also be cumulatively considerable. Implementation of the project-level mitigation

identified in Chapter 4.0 could likely effectively reduce the incremental contribution from the Proposed Amendments to a less-than-considerable level, but authority to require that mitigation would rest with other agencies that would be authorizing site-specific projects, and not with CARB. Thus, as noted in Chapter 4.0, there is inherent uncertainty in the degree of mitigation that may ultimately be implemented to reduce significant impacts. Therefore, the Proposed Amendments **could result in a cumulatively considerable contribution to a significant cumulative impact** related to land use.

12. Mineral Resources

Implementation of reasonably foreseeable compliance responses associated with the recommended actions in the 2022 Scoping Plan Update, which includes Proposed Amendments, could require both the construction and operation of new or modified facilities or infrastructure. There is uncertainty as to the exact location of these new or modified facilities and infrastructure. New facilities and infrastructure would likely occur within existing footprints or in areas with consistent zoning, where original permitting and analyses considered mineral resources issues. Although construction of new facilities and infrastructure could occur in areas outside the footprints of existing facilities, short-term construction impacts would only temporarily affect the availability of known mineral resources of local regional, or state value. Thus, the 2022 Scoping Plan Update would not result in a considerable contribution to a cumulative short-term construction-related impact on mineral resources.

Some of the recommended actions and associated compliance responses could require the extraction of minerals (e.g., lithium or platinum) used to manufacture fuel cell and battery technologies. However, implementation of these measures would not substantially deplete the supply of lithium or platinum and both are currently used in auto manufacturing processes. Therefore, the 2022 Scoping Plan Update, which includes Proposed Amendments, would not result in a considerable contribution to a cumulative long-term operational impact on mineral resources.

The Proposed Amendments would result in less-than significant effects on availability of mineral resources during construction activities, as described in Chapter 4.0. Therefore, the Proposed Amendments would not result in a cumulatively considerable contribution to a cumulative short-term construction-related impact on mineral resources.

The Proposed Amendments' contribution to a cumulative long-term operational impact would be cumulatively considerable, given the conclusion in Chapter 4.0 that the Proposed Amendments may themselves result in a significant adverse impact on mineral resources. 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 since 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 significant impacts. Thus, the Proposed Amendments **could**

result in a cumulatively considerable contribution to a cumulative short-term and long-term operational impact on mineral resources.

13. Noise and Vibration

Implementation of reasonably foreseeable compliance responses associated with the recommended actions in the 2022 Scoping Plan Update, which includes Proposed Amendments, could require construction and operation of new or modified facilities or infrastructure. These activities 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, which would be significant. Operational noise impacts would not typically be expected due to the fact that typical compliance response activities would likely occur within footprints of existing facilities, or in areas with zoning that would permit the development of these facilities. However, operational noise related to new facilities, mining operations, and renewable energy projects could emit excessive levels of noise near sensitive receptors. Thus, operational effects of equipment constructed as a result of implementation of recommended actions associated with the 2022 Scoping Plan Update could result in significant impacts. Implementation of mitigation measures could reduce potential construction-related or operational noise impacts to a less-than-significant level; however, the authority to determine project-level impacts and require project-level mitigation lies with land use and/or permitting agencies for individual projects. Thus, the 2022 Scoping Plan Update, which includes Proposed Amendments, could result in significant cumulative construction-related and operational noise impacts.

The Proposed Amendments' contribution to this significant Impact would be cumulatively considerable, given the conclusion in Chapter 4.0 that the proposed regulations may themselves result in a significant adverse impact on noise. Implementation of mitigation measures would reduce these environmental effects. However, because the authority to determine activity-level impacts and require activity-level mitigation lies with land use and/or permitting agencies for individual projects, and the programmatic level of analysis associated with this ~~Draft~~ Final EIA does not attempt to address site-specific details of mitigation, there is inherent uncertainty in the degree of mitigation that may ultimately be implemented to reduce significant impacts.

Consequently, this EIA takes the conservative approach in its post-mitigation significance conclusion and discloses, for CEQA compliance purposes, that construction-related and long-term operational impacts on noise could be significant and unavoidable. Thus, the Proposed Amendments **could result in a cumulatively considerable contribution to a significant cumulative impact** on noise.

14. Population and Housing

Implementation of reasonably foreseeable compliance responses associated with the recommended actions in the 2022 Scoping Plan Update, which includes Proposed

Amendments, could require construction and operation of new or modified facilities or infrastructure. There is uncertainty as to the exact location of these new facilities or the modification of existing facilities. These would likely occur within footprints of existing facilities, or in areas with zoning that would permit the development of such facilities. Construction of these facilities activities would require relatively small crews, and demand for these crews would be temporary (e.g., 6–12 months per project). Therefore, a substantial amount of construction worker migration would not be likely to occur, and a sufficient construction employment base would likely be available. Construction activities would not require new additional housing or generate changes in land use. Therefore, the 2022 Scoping Plan Update, which includes Proposed Amendments, would not result in a significant cumulative impact related to population and housing growth.

Implementation of reasonably foreseeable compliance responses associated with the Proposed Amendments could require construction and operation of new or modified facilities or infrastructure. There is uncertainty as to the exact location of these new facilities or the modification of existing facilities. These would likely occur within footprints of existing facilities, or in areas with zoning that would permit the development of such facilities. Construction of these facilities activities would require relatively small crews, and demand for these crews would be temporary (e.g., 6–12 months per project). Therefore, a substantial amount of construction worker migration would not be likely to occur, and a sufficient construction employment base would likely be available. Construction activities would not require new additional housing or generate changes in land use. The implementation of the Proposed Amendments is not expected to lead to job losses or large-scale worker displacement. As cleaner, alternative fuels displace some petroleum-based fuels, jobs may shift from the petroleum industry to other sectors of California's economy, such as agriculture. The shift in consumer dollars from gasoline and diesel toward cleaner, more domestically produced fuels would spur growth in well-paying jobs in the clean fuels industry.

Therefore, the Proposed Amendments would not result in a cumulatively considerable contribution to a significant cumulative impact related to population and housing growth.

15. Public Services

Reasonably foreseeable compliance responses associated with the recommended actions in the 2022 Scoping Plan Update, which includes Proposed Amendments, could include construction and operation of new or modified facilities or infrastructure. There is uncertainty as to the exact location of these new facilities or the modification of existing facilities. These would likely occur within footprints of existing facilities, or in areas with zoning that would permit the development of these 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.

Construction activities would not require new additional housing to accommodate or generate changes in land use and, therefore, would not affect the provision of public services. Therefore, the Scoping Plan Update, which includes Proposed Amendments, would not result in a significant cumulative impact related to public services.

Reasonably foreseeable compliance responses associated with the Proposed Amendments could include construction and operation of new or modified facilities or infrastructure. There is uncertainty as to the exact location of these new facilities or the modification of existing facilities. These would likely occur within footprints of existing facilities, or in areas with zoning that would permit the development of these 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. Construction activities would not require new additional housing to accommodate or generate changes in land use and, therefore, would not affect the provision of public services. Therefore, the Proposed Amendments **would not result in a cumulatively considerable contribution to a significant cumulative impact** related to public services.

16. Recreation

Implementation of reasonably foreseeable compliance responses associated with the recommended actions in the 2022 Scoping Plan Update, which includes Proposed Amendments, could require construction and operations of new or modified facilities or infrastructure. There is uncertainty as to the exact locations of potential new or modified facilities. These activities would likely occur within footprints of existing facilities, or in areas with zoning that would permit their development. In addition, demand for construction of 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. Thus, construction activities associated with reasonably foreseeable compliance responses would not be anticipated to increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration would occur. In addition, the demand for new (or expansion of) recreational-related facilities would not occur as a result of construction activities. However, new renewable energy projects could be located on recreational land or close to recreational resources. Therefore, the Scoping Plan Update, which includes Proposed Amendments, would result in a considerable contribution to a cumulative impact related to recreational facilities.

As described in Chapter 4.0, implementation of reasonably foreseeable compliance responses associated with the Proposed Amendments could require construction and operations of new or modified facilities or infrastructure. There is uncertainty as to the exact locations of potential new or modified facilities. These activities would likely occur

within footprints of existing facilities, or in areas with zoning that would permit their development. In addition, demand for construction of 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. Thus, construction activities associated with reasonably foreseeable compliance responses would not be anticipated to increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration would occur. In addition, the demand for new (or expansion of) recreation-related facilities would not occur as a result of construction activities. Therefore, the Proposed Amendments **would not result in a cumulatively considerable contribution to a significant cumulative impact** related to recreational facilities.

17. Transportation

Implementation of reasonably foreseeable compliance responses associated with the recommended actions in the 2022 Scoping Plan Update, which includes Proposed Amendments, could require construction and operations of new or modified facilities or infrastructure. In addition, new fuels standards could result in changes to imports and statewide shipments of feedstock and distribution of fuels. Although detailed information about potential specific construction activities is not currently available, some of the potential compliance responses could 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. As a result, transportation and traffic impacts during construction projects associated with the 2022 Scoping Plan Update, which includes Proposed Amendments, would be potentially significant.

Implementation of mitigation measures could reduce short-term construction related impacts to a less-than-significant level, but because the authority to determine project-level impacts and require project-level mitigation lies with land use and/or permitting agencies for individual projects, the impacts would be potentially significant and unavoidable. Thus, the 2022 Scoping Plan Update could result in a cumulative short-term transportation and traffic-related impact.

Implementation of the reasonably foreseeable compliance responses under the Scoping Plan Update could also result in impacts associated with long-term operational changes in traffic patterns or vehicle trips, or conflict with existing circulation plans.

The Proposed Amendments' contribution to this significant impact would be cumulatively considerable, given the conclusion in Chapter 4.0 that the proposed regulations may themselves result in a significant adverse impact to transportation and traffic. Implementation of mitigation measures would reduce these environmental effects. However, because the authority to determine activity-level impacts and require activity-level mitigation lies with land use and/or permitting agencies for individual projects, and the programmatic level of analysis associated with this ~~Draft~~ Final EIA does not attempt to address site-specific details of mitigation, there is inherent uncertainty in the degree of mitigation that may ultimately by implemented to reduce potentially significant impacts.

Consequently, this ~~Draft~~ Final EIA takes the conservative approach in its post-mitigation significance conclusion and discloses, for CEQA compliance purposes, that construction-related and long-term operational impacts on transportation and traffic could be potentially significant and unavoidable. Thus, the Proposed Amendments **could result in a cumulatively considerable contribution to a significant cumulative impact** on transportation and traffic.

18. Tribal Cultural Resources

Implementation of the reasonably foreseeable compliance responses associated with the 2022 Scoping Plan Update could require construction and operational activities associated with new or modified facilities or infrastructure and increased mining activities. The exact location of these new facilities or the modification of existing facilities is uncertain. 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. 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 could include tribal cultural resources. Properties important to Native American communities, including tangible properties possessing intangible traditional cultural values, also may exist.

Implementation of mitigation measures would not reduce impacts to a less-than-significant level because the authority to determine project-level impacts and require project-level mitigation lies with land use and/or permitting agencies for individual projects. Thus, implementation of the 2022 Scoping Plan Update could result in a significant cumulative impact.

The Proposed Amendments' impacts to tribal cultural resources would be significant and unavoidable on their own, as concluded in Chapter 4.0. These impacts would be significant because of the potential to damage and destroy tribal cultural resources. Because the Proposed Amendments on their own would result in a significant and unavoidable impact, the project's contribution to the significant cumulative impact would also be cumulatively considerable. Implementation of the project-level mitigation

identified in Chapter 4.0 could likely effectively reduce the incremental contribution from the Proposed Amendments to a less-than-considerable level, but authority to require that mitigation would rest with other agencies that would be authorizing site-specific projects, and not with CARB. Thus, as noted in Chapter 4.0 CARB's implementation and enforcement of project-level mitigation is legally infeasible. Therefore, the Proposed Amendments **could result in a cumulatively considerable contribution to a significant cumulative impact** on tribal cultural resources.

19. Utilities and Service Systems

Implementation of reasonably foreseeable compliance responses associated with the recommended actions in the 2022 Scoping Plan Update, which includes Proposed Amendments, could require construction and operations of new or modified facilities or infrastructure. Newly constructed or modified facilities could generate substantial increases in the demand for water supply, wastewater treatment, storm water drainage, and solid waste services in their local areas. Any new or modified facilities, no matter their size and location would be required to seek local or state land use approvals prior to their development. 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.

The specific location and type of construction needs are unknown and would depend on a variety of market factors that are not within the control of CARB, 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 to a less-than-significant level.

Implementation of mitigation measures would not reduce these impacts to a less-than-significant level because the authority to determine project-level impacts and require project-level mitigation lies with land use and/or permitting agencies for individual projects. Thus, the 2022 Scoping Plan Update, which includes Proposed Amendments, could result in a significant cumulative impact with respect to utilities and service systems.

The Proposed Amendments' contribution to this significant impact would be cumulatively considerable, given the conclusion in Chapter 4.0 that the proposed regulations may themselves result in a significant adverse impact to utility service

systems. Implementation of mitigation measures would reduce these environmental effects. However, because the authority to determine activity-level impacts and require activity-level mitigation lies with land use and/or permitting agencies for individual projects, and the programmatic level of analysis associated with this ~~Draft~~ Final EIA does not attempt to address site-specific details of mitigation, there is inherent uncertainty in the degree of mitigation that may ultimately be implemented to reduce potentially significant impacts.

Consequently, this ~~Draft~~ Final EIA takes the conservative approach in its post-mitigation significance conclusion and discloses, for CEQA compliance purposes, that construction-related and long-term operational impacts on utility service systems could be potentially significant and unavoidable. Thus, the Proposed Amendments **could result in a cumulatively considerable contribution to a significant cumulative impact** on utility service systems.

20. Wildfire

Implementation of the 2022 Scoping Plan Update could require construction and operational activities associated with new or modified facilities or infrastructure and increased mining activities. The 2022 Scoping Plan Update and the associated compliance responses indicated that these activities would result in a significant impact because there is uncertainty as to the exact locations of potential new or modified facilities that could increase fire hazards.

With respect to the Proposed Amendments, construction and operation activities as well as new or modified facilities would likely occur within footprints of existing manufacturing facilities, or in areas with appropriate zoning that permit such uses and activities; therefore, changes or modifications to existing fire response and evacuation plans would not be necessary. Additionally, new facilities would be subject to the applicable chapters of the California Fire Code and any additional local provisions identified in local fire safety codes, which would substantially reduce the risk of wildfire ignitions caused by infrastructure development. Therefore, activities related to the Implementation of the Proposed Amendments **would not result in a cumulatively considerable contribution to a significant cumulative impact** related to wildfire.

E. Growth-Inducing Impacts

As described above, a project would be considered growth-inducing if it removes an obstacle to growth, includes construction of new housing, or establishes major new employment opportunities. The reasonably foreseeable compliance responses associated with the Proposed Amendments would not result in new utility or services systems and would not include construction of new housing.

The proposed action intends to encourage the development of new, innovative fuel pathways to reduce the average CI value of California's transportation fuels market. As

described in Section 4.B.14, this would change the development and use of transportation fuels, rather than the establishment of substantially new employment opportunities. Improvements to energy resources through actions such as reducing dependence on fossil fuels and increasing use of renewable resources is generally a statewide and countrywide goal (e.g., the Federal Renewable Fuels Standard, the 2007 Energy Independence and Security Act, and Appendix F of the CEQA Guidelines). The Proposed Amendments are a method to achieve these and other goals, rather than a program that would induce a major shift in the job market.

Thus, the Proposed Amendments would encourage economic activity associated with emerging technologies and research and development related to methods that could reduce the CI values of fuels used in California. Given that several existing regulations are aimed toward goals that would reduce the environmental effects associated with fuels, such as reduced energy use and air emissions, the Proposed Amendments would contribute to these trends rather than act as the sole driving force.

6.0 Mandatory Findings of Significance

Consistent with the requirements of State CEQA Guidelines Section 15065 and Section 18 of the Environmental Checklist, this ~~Draft~~ Final EIA addresses the mandatory findings of significance for the Proposed Amendments.

A. 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" (14 CCR Section 15065[a]). In practice, this is the same standard as a significant effect 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" (14 CCR Section 15382.). As with all of the environmental effects and issue areas, the precise nature and magnitude of impacts would depend on the types of projects authorized, their locations, their aerial extent, and a variety of site-specific factors that are not known at this time but that would be addressed by environmental reviews at the project-specific level. For projects within California, all these issues would be addressed through project-specific environmental reviews that would be conducted by local land use agencies or other regulatory bodies at such time the projects are proposed for implementation. Outside of California, other state and local agencies would consider the proposed projects in accordance with their laws and regulations. CARB would not be the agency responsible for conducting the project-specific environmental or approval reviews because it is not the agency with authority to make land use or project implementation decisions.

This ~~Draft~~ Final EIA addresses and discloses potential environmental effects associated with implementation of the Proposed Amendments, including direct, indirect, and cumulative impacts. As described in Chapter 4.0, this ~~Draft~~ Final EIA discloses potential environmental impacts, the level of significance prior to mitigation, mitigation measures, and the level of significance after the incorporation of mitigation measures.

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

A lead agency shall find that a project may have a significant effect on the environment where there is substantial evidence that the project has potential environmental effects

that are individually limited, but cumulatively considerable (14 CCR Section 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" (14 CCR Section 15065[a][3]). Cumulative impacts are discussed in Chapter 5.0 in this ~~Draft~~ Final EIA.

C. 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 effect on the environment where there is substantial evidence that the project has the potential to cause substantial adverse effects on human beings, either directly or indirectly (14 CCR Section 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 effects 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, population and housing, public services, transportation/traffic, and utilities, which are all addressed in Chapter 4.0, "Impact Analysis and Mitigation Measures," of this ~~Draft~~ Final EIA.

7.0 Alternatives Analysis

This chapter of the ~~Draft~~ Final EIA provides an overview of the regulatory requirements and guidance for alternatives analyses under CEQA; a description of each of the alternatives to the Proposed Amendments; a discussion of whether and how each alternative meets the objectives of the Proposed Amendments; and an analysis of each alternative's environmental impacts.

A. Approach to Alternatives Analysis

CARB's certified regulatory program (Title 17 CCR Sections 60000–60008) requires that, where a contemplated action may have a significant effect on the environment, a staff report shall be prepared in a manner consistent with the environmental protection purposes of CARB's regulatory program and with the goals and policies of CEQA. Among other things, the staff report 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 an adverse impact. For purposes of this chapter, "feasible" means capable of being accomplished in a successful manner within a reasonable period, taking into account economic, environmental, social, and technological factors, and consistent with the Board's legislatively mandated responsibilities and duties (Title 14 CCR Section 15364).

While CARB, by virtue of its certified program, is exempt from Chapters 3 and 4 of CEQA and corresponding sections of the CEQA Guidelines, the CEQA Guidelines nevertheless contain useful information for preparation of a thorough and meaningful alternatives analysis. CEQA Guidelines Section 15126.6(a) speaks 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." The purpose of the alternatives analysis is to determine whether 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 CARB's regulatory requirements.

Alternatives considered in an environmental document should be potentially feasible and should attain most of the basic project objectives. It is critical that the alternatives analysis define the project's objectives. The project objectives are listed below in Section C of this chapter.

The range of alternatives is governed by the "rule of reason," which requires evaluation of only those alternatives "necessary to permit a reasoned choice" (Title 14 CCR Section 15126.6[f]). Further, an agency "need not consider an alternative whose effect cannot be reasonably ascertained and whose implementation is remote and speculative" (Title 14 CCR Section 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. Selection of Range of Alternatives

This chapter evaluates a range of alternatives to the Proposed Amendments that could reduce or eliminate significant effects on the environment, while still meeting basic project objectives (14 CCR Section 15126.6[a]). Pursuant to CARB's certified regulatory program, this chapter also contains an analysis of each alternative's feasibility and the likelihood that it would substantially reduce any significant adverse environmental impacts identified in the impact analysis contained in Chapter 4.0 of this ~~Draft~~ Final EIA (17 CCR Section 60004.2[a][5]).

CARB has identified alternatives that allow the public and Board to consider different approaches. CARB has made a good faith effort to identify potentially feasible project alternatives.

For the purposes of this analysis, three alternatives are evaluated:

- Alternative 1: No Project Alternative
- Alternative 2: Focused Crediting Scenario
- Alternative 3: 25% CI Reduction in 2030

Additionally, CARB has identified one alternative which was considered, but rejected:

- Alternative 4: 40% CI Reduction Stringency in 2030 and Maximum Crediting Opportunities

C. Project Objectives

The Proposed Amendments have the following objectives:

1. Improve California's long-term ability to support the production and use of increasingly lower-CI transportation fuels and to improve the program's overall effectiveness;

2. Update the annual carbon intensity benchmarks through 2030 and establish more stringent post-2030 benchmarks in alignment with the 2022 Scoping Plan;
3. Increase the flexibility of the program to adjust for potential future market over-performance by including a mechanism that would automatically accelerate the compliance targets under certain conditions;
4. Include a step-down in the near-term CI target to further support ambition;
5. Incentivize fuel production and refueling infrastructure buildout needed to meet California's long-term climate goals and reduce dependence on petroleum fuels, including opportunities to leverage federal funding for low-carbon hydrogen production and ZEV fueling, and support the transition of biomethane fuel pathways for combustion out of transportation;
6. Update standard values in the regulation, including emission factors, as well as life cycle assessment (LCA) modeling tools to use more detailed or recent data; and
7. Streamline implementation of the program.

D. Alternatives Analysis

Detailed descriptions and analyses of each alternative are presented below. The analysis of each alternative includes a discussion of the degree to which the alternative meets the basic project objectives, the degree to which the alternative avoids a potentially significant impact identified in Chapter 4.0, and any environmental impacts that may result from the alternative.

1. Alternative 1: No Project Alternative – Continuation of the Current Low Carbon Fuel Standard Regulation

a) Alternative 1 Description

Alternative 1, the "No-Project Alternative," is included to disclose environmental information that is important for considering the Low Carbon Fuel Standard. It is useful to include a "No-Project Alternative" in this analysis for the same reasons that this type of alternative is called for in the CEQA Guidelines. As noted in the CEQA Guidelines, "the purpose of describing and analyzing a no-project alternative is to allow decision-makers to compare the impacts of approving the proposed project with the impacts of not approving the proposed project" (Title 14 CCR Section 15126.6[e][1]). The No-Project Alternative also provides an important point of comparison to understand the potential environmental benefits and impacts of the other alternatives.

Under the No-Project Alternative, the Proposed Amendments would not be adopted. The LCFS would continue without strengthening the CI reduction targets beyond 2030,

maintaining the existing 2030 CI benchmark by 20% relative to 2010 levels. The ZEV infrastructure crediting provisions would not be expanded to include the medium- and heavy-duty sector. Lastly, Alternative 1 does not phase out the avoided methane crediting or apply a biomethane deliverability requirement. Other CARB programs intended to reduce GHG emissions would continue in accordance with their statutory authorities and adopted regulation.

b) Alternative 1 Discussion

1) Objectives

The No-Project Alternative would fail to meet many of the project objectives described in Chapter 2 and reiterated above. Objective 1 of the Proposed Amendments is to improve California's long-term ability to support the production and use of increasingly lower-CI transportation fuels and to improve the program's overall effectiveness. Without updating the annual CI benchmarks through 2030 and strengthening the CI benchmarks post-2030 (objective 2), there would be an oversupply of credits far beyond what is needed for compliance with the CI benchmarks. This oversupply would likely place downward pressure on the value of LCFS credits, reducing the incentive to reduce the CI of fuels, diversify the State's fuel portfolio, or commercialize pathways for new alternative fuels (objective 5). Thus, the basic project objectives would not be met.

2) Environmental Impacts

The implementation of Alternative 1 would avoid some of the potential environmental impacts described in Chapter 4.0 of this ~~Draft~~ Final EIA, specifically those associated with construction and operation of facilities related to the implementation of specific compliance responses or projects to further reduce the CI value of fuels in California beyond current LCFS targets. If compliance responses associated with the Proposed Amendments would not occur, California's fuel portfolio would be less likely to change substantially, and the average CI values of fuels, especially for combustion and legacy fleets, would decrease at a slower rate. Thus, potentially significant impacts related to compliance responses that could result in changes in shipment patterns, land use changes, additional infrastructure, and energy demand.

However, without implementation of the Proposed Amendments, GHG reductions within the transportation sector would be substantially impeded compared to reductions associated with the Proposed Amendments. Fossil fuel consumption would be higher under this Alternative than the Proposed Amendments, with all of the accompanying air quality, water quality, land use, energy resource and geological impacts. The beneficial environmental impacts of reduced GHG emissions both before and after 2030 and the air quality co-benefits associated with the LCFS program would not be realized. The State's ability to contribute to the avoidance of the most environmentally damaging impacts of long-term climate change would be limited to benefits achieved in other programs.

2. Alternative 2: Focused Crediting Scenario

a) Alternative 2 Description

Alternative 2 increases the stringency of the Proposed Project by reducing the scope of the Project to focus on a narrower suite of credit generation opportunities. This alternative is a version of the "Comprehensive EJ Scenario" recommendations made by CARB's Environmental Justice Advocacy Committee (EJAC)[95] in their August 28, 2023, recommendations to CARB. Other organizations have proposed similar concepts throughout the informal rulemaking process.[96] The differences between the Proposed Amendments and Alternative 2 are:

1. Phase out avoided methane crediting effective January 1, 2025;
2. Apply deliverability requirement to all biomethane effective January 1, 2025, including biomethane used to produce hydrogen; and
3. Eliminate credit generation opportunity for Direct Air Capture (DAC) projects.

Alternative 2 matches the Proposed Amendments with regard to the 2030 carbon intensity target and zero emission vehicle refueling infrastructure crediting. In addition, treatment of fossil jet fuel under Alternative 2 matches the Proposed Amendments and was included in the EJAC recommendations.

The Evaluation of Regulatory Alternatives chapter of the Staff Report (Ch. 9) includes a staff assessment of this Alternative with some of the additional concepts proposed by the EJAC.

---

[95] Environmental Justice Advisory Committee, *Assembly Bill 32 Environmental Justice Advisory Committee (EJAC) DRAFT Recommendations to the California Air Resources Board (CARB) on the Low Carbon Fuel Standard Regulation Updates*. August 28, 2023. *https://ww2.arb.ca.gov/sites/default/files/2023-08/EJAC%20DRAFT%20Low%20Carbon%20Fuel%20Standard%20Recommendations%20Version%202%20082823.pdf*

[96] Leadership Counsel for Justice and Accountability, Earthjustice, Animal Legal Defense Fund, Center on Race, Poverty & the Environment, Union of Concerned Scientists, Defensores Del Valle Central Para El Aire Y Agua Limpia, Santa Cruz Climate Action Network, Food & Water Watch, Center for Food Safety, Clean Water Action, California Environmental Voters, Asian Pacific Environmental Network, CleanEarth4Kids.org, 350 Ventura County Climate Hub, Communities for a Better Environment, Progressives for Democracy in America, Center for Community Action and Environmental Justice, Climate Action California, San Joaquin Valley Democratic Club, 350 Bay Area Action, Center for Biological Diversity, Central California Asthma Collaborative, Central Valley Air Quality Coalition, Center for Community Action Environmental Justice, Central California Environmental Justice Network, Physicians for Social Responsibility - Los Angeles, Valley Improvement Projects, and 350 Humboldt (may not be a comprehensive list).

b) Alternative 2 Discussion

1) Objectives

Alternative 2 is less effective than the Proposed Amendments at meeting project objectives 1 and 5.

The loss of some of the crediting opportunities for low-CI fuel would make it difficult to meet the proposed 90% CI reduction by 2045 target. Direct Air Capture (DAC) is a key component of CARB's plan to reduce greenhouse gas emissions and meet carbon neutrality by 2045.97 Eliminating credits for DAC projects would reduce one of the key incentives to deploy this technology and jeopardizes the feasibility of achieving California's long-term decarbonization targets and the 2045 carbon intensity target proposed under this project. Compliance with the regulation is difficult without direct air capture, so this scenario risks creating demand for credits that exceeds available supply beyond 2030.

Alternative 2 is also not responsive to the direction in the 2022 Scoping Plan Update, as capturing methane from dairies is one of the primary measures for achieving the State's 2045 greenhouse gas reduction targets[98] and SB 1383 methane reduction target.[99] Ending avoided methane crediting in 2025 could stop the development of new anaerobic digestor projects as the credits incentivize investment in upfront capital costs. The loss of these credits may also cause operating digestors to shut down if the operational expense is greater than the value of the gas and other incentives received by the project developers. Without anaerobic digesters, California would not be able to meet its 2030 dairy and livestock sector methane emissions reduction goal.[100]

The more stringent deliverability requirements for out-of-state biomethane and elimination of avoided methane credits could limit the diversification of the state's fuel portfolio and the use of increasingly lower-CI transportation fuels (objective 1), increase the State's dependence on fossil fuels (objective 5), and reduce investments in alternative fuel production and fueling infrastructure (objective 3). Biomethane provides substantial decarbonization potential in the near term, particularly for natural gas vehicles, while zero emission vehicle deployment continues to increase in market share. Without biomethane, more fossil natural gas is required to meet the demand of natural gas vehicles. Also, eliminating book and claim for biomethane used to produce

---

[97] California Air Resources Board, *2022 Scoping Plan for Achieving Carbon Neutrality*. 91-97. November 16, 2022. *https://ww2.arb.ca.gov/sites/default/files/2022-12/2022-sp_1.pdf*

[98] California Air Resources Board, *2022 Scoping Plan for Achieving Carbon Neutrality*. November 16, 2022. *https://ww2.arb.ca.gov/sites/default/files/2023-04/2022-sp.pdf*

[99] California Air Resources Board, *Analysis of Progress toward Achieving the 2030 Dairy and Livestock Sector Methane Emissions Target*. (Accessed on September 19, 2023). *https://ww2.arb.ca.gov/resources/documents/dairy-livestock-sb1383-analysis*

[100] Ibid.

hydrogen may unduly restrict the development of the hydrogen supply California needs in order to displace fossil fuels, identified in the 2022 Scoping Plan Update. Fossil fuel consumption would be higher under this Alternative than the Proposed Amendments, with all of the accompanying air quality, water quality, land use, energy resource and geological impacts.

Additionally, this Alternative's quickly shifting crediting opportunities and lack of gradual phase outs could create market uncertainty that could reduce investments in alternative fuel production and fueling infrastructure and could also lead to stranded assets which could cause backsliding on emission reductions already achieved. Alternative fuel producers will likely be more cautious and unwilling to invest in new fuel production and infrastructure to serve California if LCFS incentives change rapidly.

Alternative 2 does not meet these project objectives as effectively as the Proposed Amendments.

2) Environmental Impacts

Alternative 2 would reduce construction and related impacts compared to the Proposed Project, specifically those associated with construction of alternative fuel infrastructure for biomethane projects, anaerobic digestion projects at dairy/swine manure facilities, and DAC projects. This alternative would decrease the rate of deployment of low-carbon fuels, mechanical carbon dioxide removal and carbon capture and sequestration (CCS). Reduced implementation of mechanical carbon dioxide removal and CCS actions would decrease the potential for new facilities to cause long-term aesthetic impacts, direct mortality of birds and bats through collision or capture by intake fans at direct air capture facilities, drawdown of groundwater supplies to support direct air capture facilities, and long-term effects on noise generation and quality of recreation experiences in generally undeveloped areas.

Alternative 2 would include a moderate decrease in NOx emissions and significant decrease in PM2.5 emissions as compared to the Proposed Amendments. This alternative would result in comparable long-term GHG emission reductions to the Proposed Amendments.

3. Alternative 3: Reduce Project Stringency by Lowering Carbon Intensity Reduction Target to 25% in 2030

a) Alternative 3 Description

Alternative 3 is a less stringent alternative to the Proposed Project. This alternative includes all proposed amendments described in Chapter 2.0 but reduces the carbon intensity (CI) reduction target to 25% by 2030 instead of the 30% CI reduction target proposed by CARB staff. The scenario still achieves a 90% CI reduction by 2045.

b) Alternative Discussion

1) Objectives

Alternative 3 is less effective than the Proposed Amendments at meeting project objectives 2, 3 and 5. This Alternative would decrease the rate of deployment of low-carbon fuels in the near-term and development of alternative fuel infrastructure. Compliance responses for this alternative are expected to be the same types as those for the Proposed Amendments, except that the compliance responses would be less frequent and occur over a longer time period.

2) Environmental Impacts

The implementation of Alternative 3 would reduce the potential environmental impacts described in Chapter 4.0 of this ~~Draft~~ Final EIA. The reduced impacts would be in the resource areas that are already impacted by LCFS, including aesthetics, air quality, cultural resources, energy, geology and soil, hazards and hazardous materials, hydrology and water quality, noise, and transportation and traffic due to short-term construction-related processes as well as, in some instances, long-term operational processes.

Alternative 3 has fewer beneficial impacts than the Proposed Amendments. While there would be less near-term construction-related emissions due to the slower buildout of new fuel production infrastructure, there would also be fewer beneficial impacts to air quality and greenhouse gas emissions in the long-term because of the lower volume of low-CI fuels used. Compared to the Proposed Amendments, Alternative 3 would include a significant decrease in NOx emission benefits and in PM2.5 emission benefits, and substantially less long-term GHG emission reductions. Fossil fuel consumption would be higher under this Alternative than the Proposed Amendments, with all of the accompanying air quality, water quality, land use, energy resource and geological impacts.

E. Alternatives Considered but Rejected

An additional alternative was considered during development of the alternatives to the Proposed Project**.** CEQA Guidelines Section 15126.6(c) includes three factors that may be used to eliminate alternatives from detailed consideration in an EIR: “i. failure to meet most of the basic project objectives; ii. Infeasibility, or iii. Inability to avoid significant environmental impact.”

1. Alternative 4: 40% CI Reduction Stringency in 2030 and Maximum Crediting Opportunities

This alternative is based on a scenario that accelerates decarbonization by increasing the stringency of the 2030 CI target and excluding proposed project amendments that

limit or phase out credit generation opportunities.[101] The differences between the Proposed Amendments and Alternative 4 are:

1. Increase CI reduction target to 40% in 2030;
2. No crop-based biofuels sustainability criteria;
3. No phase out of avoided methane crediting; and
4. No deliverability requirements for book-and-claim of biomethane generated outside of California.

While this alternative does meet most of the objectives of the Proposed Amendments, it was rejected because increasing the CI reduction target and allowing fewer limits on biofuels crediting in this scenario increases the risk of greater environmental impacts than the Proposed Amendments. The alternative also would result in higher direct costs and CARB is mandated by AB 32 to consider the cost-effectiveness of measures. As an example of potential risk of greater environmental impacts, increasing the CI reduction target to 40% in 2030 would result in an increase of the compliance responses associated with the Proposed Amendments and in turn would result in an increase in the environmental impacts as disclosed on Chapter 4.0. CARB staff did not pursue further evaluation of this alternative for the purposes of the ~~Draft~~ Final EIA.

[101] ICF Resources LLC, *Analyzing Future Low Carbon Fuel Targets in California: Initial Results for Accelerated Decarbonization, Central Case.* Submitted to Auto-Acceleration Mechanism for the Low Carbon Fuel Standard Public Comment Docket. June 30, 2023. *https://ww2.arb.ca.gov/form/public-comments/submissions/4306*