APPENDIX B

STAFF REPORT: INITIAL STATEMENT OF REASONS

Proposed Amendments to the California Cap on Greenhouse Gas Emissions and Market-Based Compliance Mechanisms Regulation

Draft Environmental Analysis

(This Draft Environmental Analysis is also included as Appendix J to California's Compliance Plan for the Federal Clean Power Plan)

State of California

AIR RESOURCES BOARD

Release Date: August 2, 2016

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ACRONYMS AND ABBREVIATIONS

2010 FED	Functional Equivalent Document prepared for the California Cap on GHG Emissions and Market-Based Compliance Mechanisms
AB	Assembly Bill
ARB or Board	California Air Resources Board
BCS	biogas control system
$CaCO_3$	Lime
CCS	carbon capture and sequestration
CEQA	California Environmental Quality Act
CFC	chlorofluorocarbon
CFR	Code of Federal Regulations
CHP	Combined Heat and Power
CITSS	Compliance Instrument Tracking System Service
CO_2	carbon dioxide
CO_2e	carbon dioxide equivalent
CPP	Clean Power Plan
dbh	diameter at breast height
DNDC	DeNitrification-DeComposition
EA	Environmental Analysis
EGU	electric generating unit
EIR	environmental impact report
FSOR	Final Statement of Reasons
GHG	greenhouse gas
GSC	General Stationary Combustion
H_2S	hydrogen sulfide
HCFC	hydrochlorofluorocarbon
HFC	Hydrofluorocarbon
HNO_3	nitric acid

ISOR	Initial Statement of Reasons
lbs	pounds
LPG	Liquid Petroleum Gas
LCFS	Low Carbon Fuel Standard
MMC	Mine Methane Capture
MRR	Mandatory Reporting Regulations
$MTCO_2e$	metric tons of carbon dioxide equivalent
MWh	megawatt hour
N_2	nitrogen
N_2O	nitrous oxide
N_2O_4	nitrogen tetroxide
NEPA	National Environmental Policy Act
NH_3	ammonia
NO	nitric oxide
NO_2	nitrogen dioxide
NO_X	nitrogen oxides
NSPS	New Source Performance Standard
ODS	ozone depleting substances
PRC	Public Resources Code
Proposed Project	Proposed Cap-and-Trade Regulatory Amendments and California's Compliance Plan for the Federal Clean Power Plan
Regulation or Program	California's Cap-and-Trade Regulation
RPS	Renewable Portfolio Standard
SB	Senate Bill
Scoping Plan	Climate Change Scoping Plan
SIP	State Implementation Plan
SMCRA	Surface Mining Control and Reclamation Act
U.S. EPA	U.S. Environmental Protection Agency
USC	United States Code

VAM	ventilation air methane
WCI	Western Climate Initiative

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1.0 INTRODUCTION AND BACKGROUND

A. Introduction

This Draft Environmental Analysis (Draft EA) is Appendix B for the California Air Resources Board (ARB or Board) staff report presented to the Board for consideration of the Proposed Cap-and-Trade Regulatory Amendments and Appendix J for the staff report presented to the Board for consideration of the Proposed California's Compliance Plan for the federal Clean Power Plan (Proposed Project). The Project Description section of this Draft EA presents a summary of the Proposed Project, as defined under the California Environmental Quality Act (CEQA). A detailed description of the Proposed Project is included in both the "Staff Report: Initial Statement of Reasons for the Proposed 2016 Amendments to the California Cap on Greenhouse Gas Emissions and Market-Based Compliance Mechanisms," and the "Staff Report: California's Clean Power Plan (CPP) Compliance Plan," date of release August 2, 2016, which are hereby incorporated by reference.

This Draft EA is intended to disclose potential adverse impacts of the Proposed Project and identify potential mitigation measures, if significant environmental impacts are identified. The Proposed Project is intended to create environmental benefits related to greenhouse gas (GHG) reduction and improved air quality conditions. However, in some cases, as described in Chapter 4 of this Draft EA, potentially significant effects to environmental resources may occur as a result of implementation of compliance responses associated with the Proposed Project. It is expected that many of these potentially significant impacts can be feasibly avoided or mitigated to a less-than-significant level, as described in each resource area, as a result of the project-specific environmental review processes associated with compliance responses and the attendant compliance with local and state laws and regulations. The Draft EA takes the conservative approach in its post-mitigation significance conclusions (i.e., tending to overstate the risk that feasible mitigation may not be sufficient or may not be implemented by other parties) and discloses, for CEQA compliance purposes, that potentially significant environmental impacts may be unavoidable.

B. Background Information on Cap-and-Trade Regulation

California's Cap-and-Trade Regulation (Regulation or Program) was adopted by ARB in October 2011. The Regulation took effect on January 1, 2012. The first auction of emission allowances under the Program occurred in November 2012, and the first compliance period under the Program began on January 1, 2013. On January 1, 2014, California and the Canadian Province of Québec formally linked their Cap-and-Trade Programs, allowing transfers of compliance instruments between the two jurisdictions.

The Program establishes a firm, declining cap on approximately 80 percent of total statewide GHG emissions. Under the Program, ARB issues allowances equal to the total amount of permissible emissions over a given compliance period. One allowance

equals one metric ton of carbon dioxide equivalent ($MTCO_2e$). As the cap declines over time, fewer allowances are issued to continue further emission reductions. The Regulation currently covers electricity generation, including electricity imported into California to serve the State's load; large industrial sources of GHG emissions; and suppliers of gasoline, diesel, natural gas, and propane combusted at commercial, residential and small industrial sources. Fuels used for transportation within California and upstream natural gas suppliers have also been covered under the Program since 2015.

Under the Program, covered entities do not have individual or facility-specific reduction requirements. Rather, all companies covered by the Regulation are required to surrender allowances in an amount equal to their total GHG emissions during each compliance period. Covered entities can also meet up to 8 percent of their compliance requirements by surrendering approved offset credits issued under ARB-approved compliance offset protocols. As part of the initial adoption of the Cap-and-Trade Program in October 2011, ARB also adopted protocols for U.S. Forest Projects, Livestock Projects, Urban Forest Projects, and Ozone Depleting Substances (ODS) Projects.

In 2013, ARB proposed amendments to the Cap-and-Trade Regulation to extend transition assistance for some covered entities, and provided a new methodology for refinery benchmarking and allocation. The market implementation part of the Cap-and-Trade Regulation was amended to refine the data collected from registered participants to support market oversight and to add an additional cost containment measure. These amendments also included a new Mine Methane Capture (MMC) compliance offset protocol, updates to offset implementation, a minor clarification on offset usage limits, refinement of resource shuffling provisions and changes to the surrender order of compliance instruments. The Board approved these amendments in April 2014 and they took effect on July 1, 2014. Revised protocols for U.S. Forest Projects, Livestock Projects, and ODS Projects were subsequently approved in November 2014. Updates to the U.S. Forest Projects Protocol and a new Compliance Offset Protocol for Rice Cultivation Projects were approved by the Board in spring 2015.

ARB's Cap-and-Trade Regulation is identified as one of a suite of measures in the State's Climate Change Scoping Plan (Scoping Plan) to reduce GHG emissions in California to 1990 levels by 2020 and maintain and continue reductions beyond 2020.[1] By providing a declining cap on 80 percent of the state's GHG emissions, the Cap-and-

[1] The Scoping Plan contains the main strategies California will use to reduce the GHGs that cause climate change. The Scoping Plan has a range of GHG reduction actions that are referred to as "complementary policies," which include direct regulations, alternative compliance mechanisms, monetary and non-monetary incentives, voluntary actions, market-based mechanisms such as the proposed Cap-and-Trade regulation, and a cost of implementation fee regulation to fund the program. The Scoping Plan was adopted by ARB in 2008 and updated in 2014 and 2016.is being further updated to reflect the 2030 target. More information is available at http://www.arb.ca.gov/cc/scopingplan/scopingplan.htm.

Trade Program is an essential component of the overall plan to meet the 2020 limit. Executive Order B-30-15 directs agencies to take steps consistent with statutory authority to further reduce GHG emissions to 40 percent below 1990 levels by 2030. This target will be reflected in the 2030 Target Scoping Plan Update (Scoping Plan). Preliminary modeling for the Scoping Plan shows that the current suite of measures to achieve the 2020 target are working and that the statewide emissions in 2020 are expected to be well below the 2020 target. The Cap-and-Trade Program would continue to be essential in the State's efforts to meet the interim 2030 target and keep California on the path to meeting the long-term target of 80 percent below 1990 levels by 2050.

C. Background Information on Clean Power Plan

On August 3, 2015, the U.S. Environmental Protection Agency (U.S. EPA) released a regulatory package known as CPP, which contains final emissions guidelines to regulate carbon dioxide (CO_2) emissions from existing power plants under Section 111(d) of the federal Clean Air Act, 42 United States Code (USC) § 7411(d). U.S. EPA estimates that the proposed rule will reduce CO_2 emissions from the power sector 32 percent below 2005 emissions by 2030. The final rule was published in the federal Register on October 23, 2015, at 80 Federal Register 64662, and is codified in Subpart UUUU of Chapter 40, Part 60 of the Code of Federal Regulations (CFR).

CPP establishes CO_2 emission guidelines for fossil-fuel fired electric generating units (EGUs) that commenced construction on or before January 8, 2014 (henceforth "existing EGUs" or "affected EGUs"). CPP requires states with one or more affected EGUs, such as California, to develop and implement plans that identify, as appropriate, state measures and federally-enforceable emissions standards that would result in CO_2 emissions from those EGUs meeting federal targets. CPP requires California to attain one of the emissions goals shown in Table 1-1.

Table 1-1
California Emission Goals under the Clean Power Plan

Subpart UUUU Reference	Goal Basis	Interim emission goal (2022 – 2029)	Final emission goal (2030 and beyond)
Table 2	Rate-based CO_2 goal	907 (lbs CO_2/net MWh)	828 (lbs CO_2/net MWh)
Table 3	Mass-based CO_2 goal	408,216,600 (Short tons of CO_2)	96,820,240 (Short tons of CO_2, 2-year blocks starting with 2030 – 2031)
Table 4	Mass-based CO_2 goal plus new source CO_2 emission complement	430,988,824 (Short tons of CO_2)	105,647,270 (Short tons of CO_2, 2-year blocks starting with 2030 – 2031)

Notes: CO_2=carbon dioxide; lbs=pounds; MWh=megawatt hours

It is important to note that the mass-based emissions goals contained within CPP reflect U.S. EPA's initial list of affected EGUs, and must be revised if that initial list is altered in the state plan submission. ARB has carefully reviewed EGUs within California and, as CPP Compliance Plan explains, refined the list of affected EGUs. Based on this refined list, California's emissions goals are somewhat greater than those initially identified in CPP. U.S. EPA will review ARB's revised list and goal calculations as part of the plan approval process.

Under CPP, California is required to submit a compliance plan to U.S. EPA by September 6, 2016, or provide an initial submission requesting an extension (up to September 16, 2018). Because the Supreme Court "stayed" CPP in February 2016, pending litigation, these deadlines are not currently being enforced, but CPP remains federal law, and compliance planning has continued. The plan must include measures to meet these federally mandated emissions goals for EGUs subject to the Regulation. CPP compliance periods begin in 2022, with a final goal to be met in 2030 and beyond. States must also meet interim goals in a series of steps across the interim period; these steps are the periods 2022-2024, 2025-2027, and 2028-2029.

In CPP, U.S. EPA makes clear that several plan designs are available to states. In this Proposed Project, ARB would use a "State Measures" plan. Under that plan design, states may use or extend existing state programs for federal compliance, including programs that cover a broader range of sources than just CPP-affected EGUs. Such programs must be demonstrated to produce compliance with the federal targets as well as state targets. Moreover, U.S. EPA requires states to include a "backstop" in addition to the state measures, which is a regulatory system that ensures that affected EGU emissions will meet federal targets if they diverge from required levels. Upon approval of a State Measures plan, the existing underlying State Measures continue to operate as designed, but limited aspects of the measure that impose requirements on CPP-affected EGUs, as well as backstop requirements, become federally enforceable.

ARB is proposing to use the Cap-and-Trade Regulation as the primary state measure for CPP compliance purposes. This is because the Cap-and-Trade Regulation, operating in concert with state-level complementary programs (such as renewable procurement and energy efficiency requirements) would produce compliance with CPP targets for affected EGUs.[2]

[2] More information on the Clean Power Plan and ARB's compliance process is available at: http://www.arb.ca.gov/cc/powerplants/powerplants.htm.

D. Prior Environmental Analysis

1. Assembly Bill 32 Scoping Plan

The legislature passed and the Governor signed the California Global Warming Solutions Act of 2006 (Assembly Bill [AB] 32, Nunez, Statutes of 2006, chapter 488) establishing California's leadership role in climate change mitigation policy. It directed the California Air Resources Board (ARB) to begin developing discrete early actions to reduce GHG emissions, while also preparing a Climate Change Scoping Plan (Scoping Plan) to identify how best to reach the GHG reduction goals.

a) 2008 Scoping Plan

The 2008 Scoping Plan provides California's blueprint for reducing GHG emissions to 1990 levels by 2020 as directed by AB 32. The pathway laid out in the Scoping Plan to achieve long-term climate goals builds on a strong foundation of previous actions in California to address climate change and broader environmental issues. The 2008 Scoping Plan included direct regulations, performance-based standards, and market-based mechanisms. The 2008 Scoping Plan measures were designed to reduce GHG emissions by increasing the efficiency with which California uses all forms of energy and by reducing its dependence on the fossil fuels that produce GHGs. The 2008 Scoping Plan provides a framework for achieving the goals of AB 32 in a cost-effective manner by relying on a wide range of approaches, including:

- Expanding and strengthening existing energy-efficiency programs as well as the standards that apply to buildings and appliances;
- Achieving a statewide renewable-energy contribution of 33 percent;
- Establishing targets for transportation-related GHG emissions for regions throughout California, and pursuing policies and incentives to achieve those targets;
- Adopting and implementing measures that were already in progress, including California's clean-car standards, goods movement measures, and the Low Carbon Fuel Standard (LCFS); and
- Developing a California cap-and-trade program that can link with other Western Climate Initiative (WCI) partner jurisdictions to create a regional market system.

ARB, acting as the CEQA lead agency under its certified regulatory program, prepared the 2008 functional equivalent document (FED) to the AB 32 Scoping Plan document. The 2008 FED analyzed the reasonably foreseeable indirect environmental impacts that could result from implementing the measures recommended in the initial Scoping Plan. The 2008 FED also included an analysis of a range of five alternatives to the initial Scoping Plan, including a "no project" alternative, a plan relying primarily on a Cap-and-

Trade Regulation for the sectors included in a cap, a plan relying more on source-specific regulatory requirements with no cap-and-trade component, a plan relying on a carbon fee or tax, and a plan relying on variations of proposed strategies and measures. Following the public review and comment period, the initial Scoping Plan and the 2008 FED were considered by the Board at a public hearing in December 2008, and were subsequently finally approved by the Board's Executive Officer in May 2009.

b) 2011 Supplement to 2008 FED – Alternatives Analysis

In June 2011, in response to a decision by a California state trial court, ARB revisited and expanded the alternatives analysis provided in the 2008 FED. The 2011 Supplement provided an expanded analysis of the five project alternatives discussed in the 2008 FED, and superseded and replaced the project alternatives section of the 2008 FED. At a public hearing in August 2011, the Board considered and certified the combination of the 2011 Supplement, the written response to comments, and the prior environmental documents, after which it reconfirmed the approval of the initial Scoping Plan. Subsequently, the trial court dismissed that portion of the lawsuit on the grounds that ARB had fully satisfied the court's requirements for an expanded alternatives analysis.

c) First Update to the Scoping Plan

AB 32 requires ARB to update the State's Scoping Plan for achieving the maximum technologically feasible and cost-effective reductions of GHG emissions at least once every five years. (Health & Saf. Code, § 38561, subd. (h).) The First Update to the Climate Change Scoping Plan was released for public review on February 10, 2014, and continued with the approach of the 2008 Scoping Plan by recommending a balanced mix of strategies to ensure that California remains on track to meet its long-term climate stabilization objectives. The Scoping Plan Update described California's success to date in reducing GHG emissions and laid the foundation for establishing a broad framework for continued emission reductions beyond 2020, on the path to 80 percent below 1990 levels by 2050, as called for in Executive Order S-3-05 and Governor Brown's Executive Order B-16-2012 (which is specific to the transportation sector). The 2050 objective is consistent with an Intergovernmental Panel on Climate Change (IPCC)[3] analysis of the emissions trajectory that would stabilize atmospheric GHG concentrations at 450 parts per million carbon dioxide equivalent (CO_2e) and reduce the likelihood of catastrophic climate change.

ARB prepared an EA to assess the potential for adverse and beneficial environmental impacts associated with the recommended actions identified in the First Update to the Scoping Plan. At a public hearing in May 2014, the Board considered and certified the EA for the First Update to the Scoping Plan.

[3] The IPCC is the leading international body for the scientific assessment of climate change established in 1988 under the auspices of the United Nations.

2. Cap-and-Trade Regulation (2010)

Prior to the adoption of the Regulation in 2011, ARB prepared a programmatic EA for the Cap-and-Trade Regulation in a document entitled *Functional Equivalent Document prepared for the California Cap on GHG Emissions and Market-Based Compliance Mechanisms* (2010 FED), included as Attachment O to the Staff Report: Initial Statement of Reasons (ISOR) released for public review and comment in November 2010 (ARB 2010a). The 2010 FED analysis was based on the expected compliance responses of the covered entities, identified as: (1) upgrade equipment; (2) decarbonization (fuel switching); (3) implement process changes; and (4) surrender compliance instruments. The 2010 FED also analyzed the potential indirect impacts associated with development of offset projects based on the four Compliance Offset Protocols then being proposed: (1) ODS Projects; (2) Livestock Projects; (3) Urban Forest Projects; and (4) U.S. Forest Projects.

The 2010 FED concluded that covered entities' compliance with the Cap-and-Trade Regulation would result in beneficial impacts to air quality through reductions in emissions, including GHGs, criteria air pollutants, and toxic air contaminants, and beneficial impacts to energy demand. It concluded there would be no or less-than-significant impacts to aesthetics, agricultural and forest resources, hazards, land use, noise, employment, population and housing, public services, recreation, transportation and traffic, and utilities/service systems. The 2010 FED concluded there could be short-term, construction-related, potentially significant adverse impacts to air quality, biological resources, cultural resources, geology/soils and minerals, and hydrology/water quality, due to construction activities for facility-specific projects. Although the potential for adverse localized air quality impacts were found to be highly unlikely, the 2010 FED conservatively considered them potentially significant. The 2010 FED concluded that implementation of offset projects under the four approved Compliance Offset Protocols would also result in beneficial impacts to GHG emissions and no adverse impacts or less-than-significant impacts in all resource areas except for the following: implementation of projects under the Livestock Protocol was identified as having the potential for significant adverse impacts to odors, and construction impacts to cultural resources, noise, and transportation/traffic; implementation of projects under the Urban Forestry Protocol was identified as having the potential for significant adverse impacts to cultural resources; and implementation of projects under the U.S Forest Protocol was identified as having the potential for significant adverse impacts to biological resources and land use.

The 2010 FED identified mitigation that could reduce most of the identified impacts to a less-than-significant level. The 2010 FED relied on the agencies with local permitting authority to analyze site- or project-specific impacts because the programmatic 2010 FED could not determine with any specificity the project-level impacts, and ARB does not have the authority to require project-level mitigation for specific projects carried out to comply with the Cap-and-Trade Regulation. Because the programmatic analysis of the 2010 FED could not determine project-specific details of impacts and mitigation, and

there is an inherent uncertainty in the degree of mitigation ultimately implemented to reduce the potentially significant impacts, the 2010 FED took a conservative approach in its post-mitigation significance conclusion finding potentially significant impacts to these resource areas as significant and unavoidable.

The Board approved written responses to comments on the 2010 FED and adopted findings for the significant adverse impacts in Resolution 11-32 adopting the Cap-and-Trade Regulation. The written responses to environmental comments were included in the Final Statement of Reasons (FSOR) prepared for the Regulation (ARB 2011a). The Board also adopted the Adaptive Management Plan (ARB 2011b) to address any unanticipated localized air quality impacts resulting from the Cap-and-Trade Regulation and any unanticipated biological resource impacts resulting from implementation of projects under the U.S. Forest Protocol. These documents can be found on the Cap-and-Trade Program website, http://www.arb.ca.gov/regact/2010/capandtrade10/capandtrade10.htm.

3. Amendments to the Cap-and-Trade Regulation (2012)

In 2012, ARB proposed two sets of amendments to the Cap-and-Trade Regulation. The first set of amendments, related to program implementation, was approved by the Board in June 2012. The second set of amendments, related to jurisdictional linkage with Québec, was approved by the Board in April 2013. The supplemental EA prepared for these amendments was included in Chapter IV of the *Staff Report*: *Initial Statement of Reasons entitled Proposed Amendments to the California Cap on Greenhouse Gas Emissions and Market-Based Compliance Mechanisms to Allow for the Use of Compliance Instruments Issued by Linked Jurisdictions* (ARB 2012).

The EA concluded the amendments to clarify the Cap-and-Trade Regulation to help ARB implement, oversee, and enforce the Regulation would not change what was already required or the methods of compliance by covered entities evaluated in the 2010 FED (i.e., upgrade equipment, decarbonize, implement process changes, and surrender compliance instruments), and therefore, the potential for environmental impacts fell within the scope and scale of those already analyzed. The analysis also considered the potential for indirect environmental impacts resulting from California-covered entities acquiring offset credits from projects in Québec because implementation of the linkage amendments could result in California entities acquiring credits from offset projects under Québec's Digesters (i.e., Livestock), ODS, and Landfill Gas Offset Protocols. The supplemental EA relied on the prior EA conducted for California's ODS and Livestock Offset Protocols and ARB's Landfills Regulation because Québec's protocols are substantially similar. Those prior EAs concluded that implementation of these types of offset projects would result in beneficial impacts to GHG emissions and no adverse impacts, or less-than-significant impacts, in all resource areas, except implementation of the Québec's Digesters protocol, which was identified as having the potential for significant adverse impacts to odors, cultural resources, noise, and transportation/traffic. The analysis referenced recognized mitigation

measures for these impacts and determined that these impacts could be avoided or reduced to a less-than-significant level. However, because the authority to determine project-level impacts and require project-level mitigation lies with the permitting agency for individual projects, in this case Québec agencies, and there is inherent uncertainty in the degree of mitigation ultimately implemented, the analysis took a conservative approach in its post-mitigation significance conclusions finding that impacts to odors, cultural resources, and transportation/traffic in Québec may remain significant after mitigation.

The Board approved written responses to comments on the EA and adopted findings for the significant adverse impacts in Resolution 13-7 adopting the linkage amendments. The written response to comments for the first set of amendments are also included in the FSOR released in July 2012 and for the linkage amendments in the FSOR released May 2013. These documents can be found on the Cap-and-Trade Program website, http://www.arb.ca.gov/cc/capandtrade/capandtrade.htm.

4. Amendments to the Cap-and-Trade Regulation (2013)

In 2013, ARB proposed one set of amendments to the Cap-and-Trade Regulation. This set of amendments, related to program implementation, was approved by the Board in April 2014. The supplemental EA prepared for these amendments was included in Chapter III of the *Staff Report: Initial Statement of Reasons entitled Proposed Amendments to the California Cap on Greenhouse Gas Emissions and Market-Based Compliance Mechanisms* (ARB 2013a). The EA concluded the amendments to clarify the Cap-and-Trade Regulation to help ARB implement, oversee, and enforce the Regulation would not change what was already required or the methods of compliance by covered entities evaluated in the 2010 FED (i.e., upgrade equipment, decarbonize, implement process changes, and surrender compliance instruments), and therefore, the potential for environmental impacts fell within the scope and scale of those already analyzed. Relying on the 2010 FED, the supplemental EA found that the amendments to the market and offset program implementation did not change the environmental stringency established in 2010. With regard to the allowance allocation amendments, the EA did not find any significant environmental impacts as compared to the 2010 FED. The amendments related to resource shuffling were also analyzed in the EA and found to be consistent with the 2010 FED. Similarly, covered sectors and exempt emissions were analyzed in the 2010 FED. Therefore, the amendments in 2013 fell within the scope and scale of the 2010 findings.

Staff also prepared an EA for the addition of the MMC Offset Protocol (ARB 2013b). The EA for the MMC Protocol found potentially significant and unavoidable biologic and cultural resource impacts. The EA identified mitigation that could reduce most of the identified impacts to a less-than-significant level. The EA relied on agencies with local permitting authority to analyze site-or project-specific impacts because the programmatic EA could not determine with any specificity the location of projects or project-level impacts, and ARB does not have the authority to require project-level

mitigation for specific projects carried out under the MMC Protocol. Because the programmatic analysis of the EA could not determine project-specific details of impacts and mitigation, and there is an inherent uncertainty in the degree of mitigation ultimately implemented to reduce the potentially significant impacts, the EA took a conservative approach in its post-mitigation significance conclusion finding potentially significant impacts to these resource areas as significant and unavoidable.

The Board approved written responses to comments on the MMC Protocol EA and adopted findings for the significant adverse impacts in Resolution 14-4 adopting the amendments. The written responses to comments for this set of amendments are included in the FSOR released in May 2014. These documents can be found on the Cap-and-Trade Program website, http://www.arb.ca.gov/cc/capandtrade/capandtrade.htm.

5. Amendments to the Cap-and-Trade Regulation (2014)

In 2014, ARB proposed additional amendments to the Cap-and-Trade Regulation. The proposed amendments included: (1) changes in market program implementation; (2) changes in allocation; (3) adding CO_2 supplier imports as covered entities; (4) clarifications to product data reporting; and (5) updates to the existing offset protocols for Livestock Projects, U.S. Forest Projects, and ODS Projects. Staff determined that the proposed updates to market program implementation, offset program implementation, and allocation would not result in any new significant environmental impacts or a substantial increase in the severity impacts than those disclosed in the 2010 FED; therefore, the 2010 FED adequately addressed the potential environmental impacts of implementation of the amendments and no additional environmental analysis was required for those updates. Similarly, for the proposed updates to the U.S. Forest Protocol, Livestock Protocol, and ODS Protocol, ARB determined that adoption of the proposed updated protocols had no potential to cause any new significant environmental impacts or a substantial increase in the severity of impacts previously disclosed in the 2010 FED, and there were no changes in circumstances or new information to warrant any additional environmental analysis. The Board approved the proposed amendments in November 2014 in Resolution 14-31.

6. Amendments to the Cap-and-Trade Regulation (2015)

In 2015, ARB proposed an update to the U.S. Forest Protocol and a new protocol for rice cultivation projects. A supplemental EA was prepared for each as part of the ISOR for the proposed amendments. The EA, prepared for the Rice Cultivation Protocol concluded it would not result in significant adverse environmental impacts and would result in certain environmental benefits. The supplemental EA prepared for the proposed updated U.S. Forest Protocol concluded the proposed changes would not result in any new significant adverse environmental impacts than were previously addressed in the 2010 FED; however, the environmental impacts identified previously for the U.S. Forest Protocol in the 2010 FED would be extended geographically by the

proposed updates by expanding project eligibility to areas of Alaska. Because some previously identified environmental impacts were significant, the supplemental analysis updated the environmental evaluation to consider the broadened geographic area of eligibility. The supplemental EA also concluded that implementation of the updated U.S. Forest Protocol would result in environmental benefits.

The Board approved written responses to comments on the EA and adopted findings for the significant adverse impacts and adopted the amendments in June 2015 in Resolution 15-19. The written responses to comments are also included in the FSOR released in October 2015. These documents can be found on the Cap-and-Trade Program website, http://www.arb.ca.gov/cc/capandtrade/capandtrade.htm.

E. Environmental Review Process

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

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

ARB has determined that approval of the Proposed Project is a "project" as defined by CEQA see Cal. Code Regs., tit.14, § Section 15378(a)). The CEQA Guidelines define a "project" as "the whole of an action, which has a potential for resulting in either a direct physical change in the environment, or a reasonably foreseeable indirect physical change in the environment, and that is … an activity directly undertaken by any public agency."

The two elements of the Proposed Project, the 2016 Cap-and-Trade Amendments and the California CPP Compliance Plan, are distinct ARB proposals developed under different legal mandates. However, the two proposals are being analyzed as one project under CEQA because they are interrelated in two important ways: 1) CPP Compliance Plan ARB proposes would be implemented, in substantial part, through amendments to the Cap-and-Trade Program and 2) compliance responses by entities subject to the

Cap-and-Trade Program and the California CPP Compliance Plan would occur concurrently in response to both proposals.[4] Assessing these proposals together captures these compliance responses, which are the physical actions reasonably expected to occur in response to both proposals. This approach is consistent with CEQA's requirement that an agency consider the whole of an action when it assesses a project's environmental effects, even if the project consists of separate approvals.[5]

Although the policy aspects of the Proposed Project do not directly change the physical environment, physical changes to the environment could result from reasonably foreseeable compliance responses taken as a result of implementation of the measures identified in the Proposed Project.

Furthermore, the requirements of PRC section 21159 apply when ARB adopts a rule or regulation requiring the installation of pollution control equipment, or a performance standard or treatment requirement. As explained in section 15187 of the CEQA Guidelines, ARB shall conduct "an environmental analysis of the reasonably foreseeable methods by which compliance with that rule or regulation will be achieved" (see Cal. Code Regs., tit.14, § 15187). The analysis shall include reasonably foreseeable environmental impacts of the methods of compliance, reasonably foreseeable feasible mitigation measures related to significant impacts, and reasonably foreseeable alternative means of compliance that would avoid or eliminate significant impacts.

2. 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 environmental analysis for broad programs will necessarily be less detailed than that for a specific project (see Cal. Code Regs., tit.14, § 15146). For example, the assessment of a particular construction project would naturally be more detailed than one concerning the adoption of a local general plan because the construction effects can be predicted with a greater degree of accuracy (see Cal. Code Regs., tit.14, § 15146 (a)). This analysis addresses a broad market-based regulatory program, so a general level of detail is appropriate. However, this Draft EA makes a rigorous effort to evaluate significant adverse impacts and beneficial impacts of the regulatory program and contains as much information about those impacts as is currently available, without being unduly speculative.

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[4] It is important to note that the CPP Compliance Plan would not, itself, become binding law unless it is approved by U.S. EPA. However, aspects of the CPP Compliance Plan that are reflected in the Cap-and-Trade Regulation Amendments will become law in California, if approved by the Board.

[5] Amendments are also being made to the Regulation for the Mandatory Reporting of Greenhouse Gas Emissions. Though these amendments may, among other purposes, provide information used by the Cap-and-Trade Regulation and by the CPP Compliance Plan, because the reporting regulation is entirely an information-gathering provision, with no direct environmental impacts, these amendments are being treated under a separate CEQA process.

The scope of analysis in this Draft EA is intended to help focus public review and comments on the Proposed Project, and ultimately to inform the Board of the environmental benefits and adverse impacts before Board action on the proposal. This analysis focuses on reasonably foreseeable potentially significant adverse and beneficial impacts on the physical environment resulting from reasonably foreseeable compliance responses taken in response to implementation of the proposed actions within the Proposed Project. As used in this Draft EA, the term "compliance responses" refers to the reasonably foreseeable activities that may occur in response to the provisions of the Proposed Project, including both the mandatory (i.e., compliance with regulatory requirements) and voluntary (i.e., project development under offset protocols) aspects of the Proposed Project.

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

1. The analysis addresses the potentially significant adverse environmental impacts resulting from implementing the Proposed Project 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 Project.

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

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

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

the full range of reasonably foreseeable actions undertaken in response to the Proposed Project.

F. Organization of the Environmental Analysis

The Draft EA is organized into the following chapters to assist the reader in obtaining information about the Proposed Project and specific environmental issues.

- Chapter 1, Introduction and Background – provides a project overview, background information, and other introductory material.
- Chapter 2, Project Description – summarizes the Proposed Project, implementation assumptions, and reasonably foreseeable compliance responses taken in response to the Proposed Project.
- Chapter 3, Environmental and Regulatory Setting, in combination with Attachment A – contains the environmental setting and regulatory framework relevant to the environmental analysis of the Proposed Project.
- Chapter 4, Impact Analysis and Mitigation – identifies the potential environmental impacts associated with the Proposed Project and mitigation measures for each resource impact area.
- Chapter 5, Cumulative and Growth-Inducing Impacts – identifies the cumulative effects of implementing the Proposed Project against a backdrop of past, present, and reasonably foreseeable future projects.
- Chapter 6, Mandatory Findings of Significance – discusses whether the Proposed Project has the potential to degrade the quality of the environment, cause substantial adverse impacts on human beings, and cause cumulatively considerable environmental impacts.
- Chapter 7, Alternatives Analysis – discusses a reasonable range of potentially feasible alternatives that could reduce or eliminate adverse environmental impacts associated with the Proposed Project.
- Chapter 8, References – identifies sources of information used in this Draft EA.

G. Public Review Process for the Environmental Analysis

At a public workshop held on December 14, 2015, ARB described plans to prepare a Draft EA for the Proposed Project and invited public feedback on the scope of the analysis.

In accordance with ARB's certified regulatory program, and consistent with ARB's commitment to public review and input on its proposed actions, this Draft EA is subject to a public review process through the posting of the Proposed Project along with this Draft EA for a public review period that begins on August 5, 2016 and ends on September 19, 2016.

At the conclusion of the public review period, ARB will prepare written responses to environmental comments received on the Draft EA and make revisions to the Draft EA, as necessary. The Final EA and the written responses to environmental comments will be considered by the Board at a public hearing in spring 2017. If the Proposed Project is approved, a Notice of Decision will be posted on ARB's website and filed with the Secretary for Natural Resources. (Cal. Code Regs., tit. 17, § 60007 (b)). The Notice of Decision will also be filed with the State Clearinghouse.

H. Incorporation of Documents by Reference

The Proposed Project would modify California's Cap-and-Trade Regulation adopted by ARB in 2011, as amended. This Draft EA relies on documents previously prepared and adopted by ARB, for both project description information and the evaluation of environmental impacts. Information related to the project description, reasonably foreseeable compliance responses, and environmental impacts and mitigation measures associated with the Proposed Project is consistent with information provided in the following documents, which are incorporated by reference: 2008 Scoping Plan FED – SCH# 2008102060 (ARB 2008)[6], 2011 Supplement to the Scoping Plan FED – SCH# 2008102060 (ARB 2011c)[7], 2010 Cap-and-Trade FED – SCH# 2010102056 (ARB 2010a)[8]; First Update to the Scoping Plan EA – SCH# 2014032037 (ARB 2014c)[9]; the Proposed Regulation to Implement the California Cap-and-Trade Program ISOR, Appendix P: Co-Pollutant Emissions Assessment (ARB 2010c)[10]; the Regulation to Reduce Methane Emissions from Municipal Solid Waste Landfills ISOR, Chapter VI (ARB 2009)[11]; the Compliance Offset Protocol Rice Cultivation Projects ISOR, Appendix B– SCH# 2010102056 (ARB 2014a)[12]; Compliance Offset Protocol MMC Projects ISOR, Appendix A – SCH# 2010102056 (ARB 2013b)[13], Amendments to the California Cap on Greenhouse Gas emissions and Market-based Compliance Mechanisms to Allow for Use of Compliance Instruments Issued by Linked Jurisdictions (i.e., linkage to

[6] http://www.arb.ca.gov/cc/scopingplan/document/appendices_volume3.pdf
[7] http://www.arb.ca.gov/cc/scopingplan/document/final_supplement_to_sp_fed.pdf
[8] http://www.arb.ca.gov/regact/2010/capandtrade10/capv5appo.pdf
[9] http://www.arb.ca.gov/cc/scopingplan/2013_update/appendix_f_final_ea.pdf
[10] http://www.arb.ca.gov/regact/2010/capandtrade10/capv6appp.pdf
[11] http://www.arb.ca.gov/regact/2009/landfills09/isor.pdf
[12] http://www.arb.ca.gov/regact/2014/capandtradeprf14/capandtradeprf14isorappb.pdf
[13] http://www.arb.ca.gov/regact/2013/capandtrade13/capandtrade13isorappa.pdf

Québec) ISOR – SCH# 2010102056 (ARB 2012)[14], and the Compliance Offset Protocol U.S. Forest Offset Projects ISOR, Appendix C – SCH# 2010102056 (ARB 2014b)[15]. The Draft EA presented herein relies on the description of projects and the analysis in these documents to the extent that the environmental impacts of the Proposed Project would be consistent with those addressed in the prior CEQA documents, rather than repeating relevant information. In these cases, this Draft EA summarizes the relevant information presented in the prior CEQA documents. All documents incorporated by reference are available at ARB's website: http://www.arb.ca.gov (specific links to the documents are listed in the footnotes) and at the ARB Headquarters Building, located at 1001 "I" Street, Sacramento, CA.

[14] http://www.arb.ca.gov/regact/2012/capandtrade12/isormainfinal.pdf
[15] http://www.arb.ca.gov/regact/2014/capandtradeprf14/capandtradeprf14isorappc.pdf

2.0 PROJECT DESCRIPTION

For the purposes of this Draft Environmental Analysis (Draft EA), the California Air Resources Board (ARB or Board) considers the recommended actions in the Proposed 2016 Cap-and-Trade Amendments and Clean Power Plan (CPP) Compliance Plan (Proposed Project) together to be the "project" evaluated under the California Environmental Quality Act (CEQA). CEQA defines a "project" as a discretionary action that has the potential to result in either a direct physical change in the environment, or a reasonably foreseeable indirect physical change in the environment. (Cal. Code Regs, tit. 14, § 15378.) Here, the reasonably foreseeable compliance actions taken in response to implementation of the Proposed Project have the potential to result in either a direct physical change in the environment or a reasonably foreseeable indirect physical change in the environment.

The Proposed Project would extend California's Cap-and-Trade Program, which is a key aspect of California's Assembly Bill (AB) 32 suite of programs to reduce greenhouse gas (GHG) emissions. AB 32 provided initial direction on creating a comprehensive multiyear program to limit California's GHG emissions at 1990 levels by 2020 and initiate the transformations required to achieve the State's long-range climate objectives. Under AB 32, California is required to reduce GHG emissions to 1990 levels by 2020, and to maintain and continue reductions thereafter. In addition, Executive Order B-30-15 directs agencies to take steps consistent with statutory authority to further reduce GHG emissions to 40 percent below 1990 levels by 2030. California has employed the economy-wide Cap-and-Trade Program to reduce emissions and drive long-term investment in cleaner and more efficient technologies and energy. The Cap-and-Trade Program establishes a firm and declining cap covering about 80 percent of the State's GHG emissions and allows trading of allowances and offsets to ensure cost-effective emissions reductions.

The Proposed Project would streamline implementation, continue implementation of the Cap-and-Trade Program through 2030, may extend allowance allocation beyond 2020 and add assistance factors for industrial entity leakage prevention for a post-2020 Program, link California's Cap-and-Trade Program with Ontario, Canada and provide a mechanism for compliance with the federal CPP. The elements of the Cap-and-Trade Program and CPP Compliance Plan are discussed in the following sections.

A. Project Objectives

The primary objectives of the Proposed Project are listed below. These objectives are derived from the requirements of AB 32 to limit GHG emissions in California, with continued reductions in emissions beyond 2020; Executive Order B-30-15, which establishes a GHG reduction target of 40 percent below 1990 levels by 2030; the 2030 Target Scoping Plan Update, which will frame the suite of measures and regulations to comply with EO B-30-15, including continuation of the Cap-and-Trade Program beyond

2020; and from the requirements of section 111(d) of the federal Clean Air Act (CAA) and with the federal CPP promulgated under CAA.

The major administrative and Program implementation objectives of the Proposed Project include the following:

1. Continue Objectives of 2010 Cap-and-Trade Program

The *Functional Equivalent Document prepared for the California Cap on GHG Emissions and Market-Based Compliance Mechanisms* (2010 FED) contains the primary objectives of the Cap-and-Trade Program when the Regulation was initially adopted in 2011. These objectives are:

1. Achieve technologically feasible and cost effective aggregate reductions;
2. Distribute allowances equally;
3. Avoid disproportionate impacts;
4. Credit early action;
5. Complement existing air standards;
6. Be cost-effective;
7. Consider a broad range of public benefits;
8. Minimize administrative burden;
9. Minimize leakage;
10. Weigh relative emissions;
11. Achieve real emission reductions;
12. Achieve reductions over existing regulation;
13. Complement direct measures;
14. Consider emissions impacts;
15. Prevent increases in other emissions;
16. Maximize co-benefits;
17. Avoid duplication;
18. Establish declining cap;
19. Reduce fossil fuel use;
20. Link with partners;
21. Design enforceable, amendable program; and
22. Ensure emissions reductions.

Generally, the Proposed Project seeks to uphold these existing objectives in the continuation of the Program during the third compliance period and continuing beyond 2020, with the following changes:

- *2010 FED Objective 4: Credit early action -- to ensure, to the extent feasible, that entities that have voluntarily reduced their GHG emissions prior to the implementation of this regulation receive appropriate credit for early voluntary actions (Health & Saf. Code, § 38562 (b)(3));*

- The final early action offset credits will be issued in 2016; therefore, an early action offset credit issuing process will not be incorporated in the regulatory amendments for the third compliance period or the post-2020 Program.

- *2010 FED Objective 18: Establish declining cap – to establish a declining cap covering 85 percent of the state's GHG emissions in furtherance of California's mandate to reduce GHG emissions to 1990 levels by 2020;*

  - The Proposed Project contains caps that continue to decline post-2020. This is discussed below under Objective 3.

2. Meet Long-Term Climate Objectives Beyond 2020

AB 32 charges ARB with monitoring and regulating sources of emissions of greenhouse gases, and it directs ARB to adopt rules and regulations to achieve the "maximum technologically feasible and cost-effective" emissions reductions. AB 32 also requires California to reduce its GHG emissions to 20 percent below 1990 levels by 2020, and to maintain and continue GHG reductions, and states the legislature's intent that the statewide GHG emissions limit continue in existence and be used to maintain and continue GHG emission reductions beyond 2020. Executive Order B-30-15 establishes a target for California to further reduce GHG emissions to 40 percent below 1990 levels by 2030. This target aligns with scientifically established levels needed in the United States to limit global warming below 2°C and establishes an interim goal along the pathway of ultimately reducing GHG emissions to 80 percent below 1990 levels by 2050. Continuing and expanding past 2020 the suite of programs created in response to AB 32, including Cap-and-Trade, is consistent with statutory direction and critical to achieving the interim target set forth in EO B-30-15.

3. Streamline the Implementation of the Cap-and-Trade Program

Through the implementation of the Cap-and-Trade Program and through stakeholder feedback, Staff has identified potential opportunities for streamlining Program requirements and improving Program efficiency, including the Compliance Offset Program, auctions, and the management of information. Areas of potential streamlining include a one-time annual intent to bid in the quarterly auctions, submittal of registration and corporate association data electronically, and timing for ARB compliance offset credit issuance.

4. Extend Allowance Allocation Beyond 2020 and Incorporate Results of Leakage Studies

Allowance allocation is currently provided to covered entities to prevent emissions leakage, protect ratepayers, further the purposes of AB 32, recognize early action to reduce greenhouse gas emissions, and transition entities into the Cap-and-Trade

Program. ARB proposes to extend beyond 2020 allowance allocation to industrial entities, electrical distribution utilities, natural gas suppliers, public wholesale water agencies, legacy contract generators with industrial counterparties, universities, and public service facilities to continue all of these allocation purposes except transition assistance.

Staff also proposes to update industrial allocation assistance factors to prevent emissions leakage as required by AB 32. Leakage is a reduction in emissions of GHG within the State that is compensated by an increase in emissions of GHG outside the State. To prevent leakage due to implementation of the Cap-and-Trade Program, the initial Regulation provided transition assistance by issuing free allowances to covered entities for the first three compliance periods, with a decreasing Industry Assistance Factor for some covered entities for the third compliance period. ARB contracted with three research groups to assess the leakage potential for industries covered by the Cap-and-Trade Program. These studies were completed in May 2016. Studies addressed three broad topics: international leakage, domestic leakage, and food processor leakage.

As part of a 15-day comment period, ARB may propose updates to post-2020 allocation and industrial allocation assistance factors.

5. Facilitate Linkage with Other Western Climate Initiative Markets

The Western Climate Initiative (WCI) regional market currently includes California's and Québec's Cap-and-Trade programs. In April 2015, Ontario, Canada announced plans to implement an economy-wide carbon market to link with the WCI market, and in May 2016 Ontario passed a law and issued regulations for a cap-and-trade and greenhouse gas reporting program. The Proposed Project includes a framework to add Ontario and continue linkage with Québec.

6. Comply with the Federal Clean Power Plan

The federal CPP is an action of the federal government to reduce GHG emissions. CPP facilitates the use of emissions trading markets for compliance, including markets that cover more entities than CPP-affected electric generating units (EGUs). California is in a good position to use existing state programs, specifically, the Cap-and-Trade Program, to comply with the federal CPP as part of a "State Measures" compliance plan design. Integrating CPP Compliance Plan into the Cap-and-Trade Program may also support a broader national carbon market as CPP, and other potential federal programs, mature. Therefore, the Proposed Project includes regulatory amendments to facilitate CPP compliance.

7. Ensure Compliance Obligations are Applied Consistently for Imported Electricity

The California Independent System Operator (CAISO) is implementing an Energy Imbalance Market (EIM) that allows for trading of "imbalance" energy in CAISO's realtime energy markets. The EIM algorithm "deems" electricity from certain sources as dispatched to serve California load in part on the basis of estimated greenhouse gas "bid adders" within the CAISO market. ARB and CAISO continue to work to ensure imports through CAISO markets are fully accounted for under the Regulation. In particular, additional sources within the market may be dispatched, or may change their behavior, as a direct result of EIM market operations serving California load. Fully accounting for emissions associated with imports to serve California load involves accounting for these emissions as well. The Proposed Project includes regulatory amendments designed to ensure these emissions are accounted for and included as a compliance obligation for those entities serving California load whose behavior results in those emissions. Not fully accounting for all the emissions associated with imports to serve California load will result in emissions leakage. AB 32 requires ARB to minimize the potential for emissions leakage to the extent feasible.

B. Compliance Responses for Covered Entities

As discussed above, the Proposed Project builds upon the 2010 Cap-and-Trade Regulation. Covered entities, evaluated under the 2010 Cap-and-Trade Regulation, would continue to be regulated under the Proposed Project. The following provides a summary of covered entities and a discussion of the reasonably foreseeable compliance actions that were evaluated in the 2010 FED, organized by sector.

The reasonably foreseeable compliance responses discussed in this section focus on those activities with the potential to result in either a direct or indirect physical change in the environment. These include construction activities, infrastructure and equipment installations, and substantial operational changes to facilities. While the purchase of compliance instruments is also a reasonably foreseeable compliance response, it would not result in direct physical effects on the environment.

This discussion provides a summary of compliance responses that were initially addressed in the 2010 FED. Under the 2010 FED, carbon capture and sequestration (CCS) was considered to be an emerging technology. Currently, CCS is a developing technology, which is in use at sites throughout the world. However, it is not a reasonably foreseeable compliance response to the proposed Cap-and-Trade Regulation Amendments and California's CPP Compliance Plan for the purposes of CEQA analysis. This is because the Cap-and-Trade Regulation and Mandatory Reporting Regulation (MRR) do not currently contain mechanisms allowing covered entities to adjust their reported emissions and, hence, compliance obligations to account for the effects of CCS. Implementing CCS, therefore, would not affect the compliance requirements of these regulations and is not a reasonably foreseeable compliance response under the Proposed Project. ARB is developing quantification mechanisms for CCS in a separate public process; depending on the outcome of that process, CCS methodologies may be incorporated as appropriate into the Cap-and-Trade Regulation

and MRR, but this would require separate amendments not currently proposed or under consideration.

1. Cement Production

Cement manufacturing facilities prepare, combine, and process ingredient materials to produce cement. The common ingredients in cement are limestone, silica, aluminates, and ferric minerals. Minerals are largely obtained from mining. Other ingredients, like slag or fly ash are obtained from other manufacturing processes. Silica is often obtained from stream or lake dredging. The manufacturing process begins with crushing and blending the ingredients in a large ball mill. The crushed mixture is conveyed into a rotary kiln and heated. The initial heating drives off the carbon dioxide (CO_2) and dries the material. Heating at higher temperatures, approximately 2700°F, fuses the materials into "clinker." Clinker is cement in the form of rocks that are roughly two inches in diameter. Clinker is ground into a very fine powder which is sold as cement. Coal is the most common fuel used in cement manufacture, but alternative fuels are being used to augment coal at a growing number of facilities.

a) Reasonably Foreseeable Compliance Responses

Reasonably foreseeable compliance responses to meet post-2020 emissions requirements from cement production would be similar to those described in the 2010 FED, summarized as follows.

- Reduced GHG emissions could result from installation of energy efficiency measures to reduce fuel consumption, switching to a less carbon intensive fuel, and/or altering a process to make the production process more efficient. Potential alternative fuels that could be suitable for cement manufacture include biomass and discarded tires, both of which have been implemented to a limited degree by some cement manufacturers.

- Increasing the proportion of pozzolans (cement ingredients, siliceous and/or aluminous) in concrete could produce a greater amount of concrete to meet future demands without increasing cement manufacturing and associated emissions.

2. Cogeneration (Combined Heat and Power)

Cogeneration, commonly referred to as combined heat and power (CHP), is the practice of operating a boiler to produce steam both to generate electricity and for applications that require indirect heat, such as warming buildings or industrial processes. The extraction of dual functions (heat and power) from the same steam is an energy efficient design that can be cost-effective in many situations. Cogeneration produces electricity and heat with up to 40 percent less fuel than required to produce the electricity and heat separately.

a) Reasonably Foreseeable Compliance Responses

Reasonably foreseeable compliance responses to meet post-2020 emissions requirements from cogeneration facilities would be similar to those described in the 2010 FED, summarized as follows.

- Energy efficiency measures for combustion include improving heat containment in the combustion chamber by closing leaks, increasing combustion efficiency and reducing fuel use, and switching to improved fuels. Additional discussion of fuel combustion and GHG emissions is presented under the "Stationary Combustion" subsection below.

3. Glass Production

Glass manufacturers produce glass for a variety of residential, commercial, institutional, and industrial purposes. The most common substances in glass are silica, sodium bicarbonate or potash, and lime. These naturally occurring substances are readily available throughout most of North America. In the glass manufacturing process, the silica, soda, and lime are placed in a melting furnace with a temperature of approximately 2,500°F for as long as 24 hours. Fragments of recovered glass, called cullet, are added to the melting furnace for recycling. Following melting, the molten glass is cooled several hundred degrees to a temperature that allows it to be worked into the desired form. Finally, the formed glass is placed in a "lehr" oven which regulates cooling to increase the uniformity and strength of the glass. Fiberglass and textile fibers are created by specialized cooling and finishing processes. Fiberglass manufacturing accounts for the least emissions of all glass manufacturing, in large part due to heavy reliance on electricity rather than fossil fuels.

a) Reasonably Foreseeable Compliance Responses

Reasonably foreseeable compliance responses to meet post-2020 emissions requirements from glass production would be similar to those described in the 2010 FED, summarized as follows.

- The most likely methods to reduce GHG emissions from glass manufacturing are energy efficiency measures that reduce fuel use. Maximizing cullet use and optimizing the melting operation are the most promising methods to reduce fuel consumption. Manufacturing new glass from existing glass (cullet) requires significantly less energy than production from raw materials and produces fewer direct process emissions. Heating the furnace to melt materials is the primary use of energy in glass manufacturing. Preheating cullet with waste heat from the primary furnace reduces the fuel required to melt the material in the primary furnace.

- The efficiency of existing furnaces and kilns can be increased through the installation of various improvements including such measures as new control systems, reducing air leaks, adjustable speed fans, use of waste heat, or full

replacement of aging furnaces with modern systems. Fuel switching to use oxy-fuel reduces fuel emissions by introducing pure oxygen to achieve hotter temperatures using less natural gas.

4. Hydrogen Production

Nearly all of the hydrogen consumed in the United States is for petroleum and chemical refining, as a reducing agent for metal ores, or for processing foods. Hydrogen is used to refine crude oil into lighter gas and oil products, methyl alcohol, methanol, and hydrochloric acid. One of the most significant uses of hydrogen in California is desulfurization of gasoline and diesel as well as petroleum cracking. Desulfurization is a major reason that California refineries are increasing hydrogen production capacity. Hydrogen is used as a food additive to hydrogenate oils and fats. Hydrogen is also used to create ammonia (NH_3) for fertilizers. Research continues to develop hydrogen as a clean transportation fuel. Processes for producing hydrogen include steam reforming from natural gas or methane, chemical reaction with hot coke, electrolysis of water, and the interaction of mineral acids and metals.

Hydrogen is typically produced from a natural gas feedstock through a catalyst mediated process known as steam methane reforming. Other methods of hydrogen production include electrolysis and thermolysis. The majority of the hydrogen produced in California is consumed by petroleum refineries and refinery hydrogen demand has been increasing to meet the demands of more stringent fuel requirements (lower sulfur content) and to cope with heavier crude oil supplies. Hydrogen is also a primary feedstock for the production of NH_3 and methanol.

a) Reasonably Foreseeable Compliance Responses

Reasonably foreseeable compliance responses to meet post-2020 emissions requirements from hydrogen production would be similar to those described in the 2010 FED, summarized as follows.

- Small reductions in GHG emissions can be achieved by maximizing the hydrogen to carbon monoxide ratio of the plant feedstock. Efficiency can also be enhanced by recovering waste heat to generate electricity. Depending on the hydrogen production process and the purity of the resulting CO_2, some facilities may capture and sell their CO_2 emissions.

5. Iron and Steel Manufacturing

There are two basic types of iron and steel mills, integrated mills and mini-mills. Integrated mills produce iron and steel from iron ore. In an integrated mill, ore is initially melted in a blast furnace. Iron and steel manufacturing includes a number of processes that emit GHG emissions, representing three to four percent of global man-made GHG emissions. CO_2 is the major GHG produced in steel manufacturing.

Process emissions are primarily produced during melting rather than reheating. Sources of process emissions include:

- reducing agents (e.g., coke and other additives)
- lime production (lime used as a flux agent)
- oxidation of carbon in process melts
- consumption of carbon electrodes
- carbon blown to make foamy slag
- use of soda ash

In addition to process emissions, CO_2 is emitted by the combustion of fuels used to heat the various furnaces operated for steel processing. Other fugitive GHG emissions include hydrofluorocarbons (HFCs) from refrigeration and cooling systems.

a) Reasonably Foreseeable Compliance Responses

Reasonably foreseeable compliance responses to meet post-2020 emissions requirements from iron and steel manufacturing would be similar to those described in the 2010 FED, summarized as follows.

- Process emissions are generally regarded as an unavoidable consequence of chemical and heating processes. Significantly reducing the production of these gases would require modification of materials used and/or manufacturing processes and could be more difficult to implement than other control strategies.

- Using improved foaming control devices, or upgrading of exhaust capture and treatment devices, such as scrubbers, could be effective strategies for older facilities.

- Although combustion emissions are not as great as process emissions, energy efficiency improvements to improve the combustion process and reduce the amount of fuel required can contribute to overall reduction of GHG emissions intensity.

- Further energy efficiency improvements could include enhancing continuous production processes to reduce heat loss, and increasing recovery of waste energy and process gases to provide electricity and supplemental heat.

6. Lime Manufacturing

Lime ($CaCO_3$) is the product of calcining limestone. It is used in various industrial and other applications, including steelmaking, flue gas desulfurization at steam electric power plants, construction, water treatment, mining, precipitated calcium carbonate, and pulp and paper.

Limestone is quarried and crushed into manageable sized particles for placement in a kiln. Limestone kilns heat the material to sufficient temperatures to drive off CO_2, leaving a material called quicklime. Quicklime is the basic form of commercially available lime. Limestone kilns are fueled with natural gas (4 percent), coal (67 percent), or other fuels such as lignite, or fuel oil (MECS 2006).

a) Reasonably Foreseeable Compliance Responses

Reasonably foreseeable compliance responses to meet post-2020 emissions requirements from lime manufacturing would be similar to those described in the 2010 FED, summarized as follows.

- Measures to reduce GHG emissions include the installation of more efficient equipment, improved control of industrial processes, improved heat containment by reducing leaks, and switching to improved fuels or electricity.

7. Nitric Acid Production

Nitric acid (HNO_3) is a highly corrosive and toxic strong acid. The primary use of HNO_3 is the manufacture of ammonium nitrate for fertilizer production. Other applications of HNO_3 include the manufacture of adipic acid, terephtahlic acid, and other organic compounds, gold and silver separation, manufacture of munitions, steel, brass pickling, photoengraving, and acidulation of phosphate rock.

Nearly all the HNO_3 produced in the United States is manufactured by the high-temperature catalytic oxidation of NH_3. In this process, NH_3 is pressed over a catalyst of platinum and rhodium gauze and oxidized into nitric oxide (NO). The oxidation of NH_3 is an exothermic reaction producing temperatures of 1,380ºF to 1650ºF. Higher catalyst temperatures produce greater amounts of NO while lower temperatures result in nitrogen (N_2) and nitrous oxide (N_2O). N_2O is the primary GHG resulting from HNO_3 production. In a second stage, the NO produced in the initial catalytic process is cooled under pressure, reacting with oxygen to produce nitrogen dioxide (NO_2) and nitrogen tetroxide (N_2O_4). In the last stage, the NO_2 and N_2O_4 are pumped into an adsorption tower. Deionized water is blown through the tower, and the resulting interaction produces HNO_3.

The Clean Air Act's New Source Performance Standard (NSPS) Program requires the U.S. EPA to establish maximum emission rates for certain stationary sources. Prior to 2012, the HNO_3 production NSPS was last revised in 1984. In the final rule dated May 14, 2012, U.S. EPA declined to take action on a N_2O emission standard for nitric acid plants, however stated their intention to continue working toward a proposal for GHG emission standards for nitric acid plants.

a) Reasonably Foreseeable Compliance Responses

Reasonably foreseeable compliance responses to meet post-2020 emissions requirements from nitric acid production would be similar to those described in the 2010 FED, summarized as follows.

- It is not clear how HNO_3 plant operators in California would respond to reduce N_2O emissions. Non-Selective Catalytic Reduction technology is not implemented in most modern plants because of high energy costs and high gas temperatures. Without a clear alternative, as long as the price of allowances and/or offsets is less than available abatement technology, it is reasonable to expect that nitric plant operators would choose to purchase allowances or offsets rather than upgrade their plants.

8. Oil and Natural Gas Systems

Petroleum is a naturally occurring substance which consists of a mixture of hundreds of different hydrocarbons—molecules containing hydrogen and carbon—that exist sometimes as a liquid (crude oil) and sometimes as a vapor (natural gas). Often, petroleum is extracted from geologic formations as mixed fluids containing oil, water, and gas.

Natural gas is a combustible, fossil fuel composed of almost entirely methane, typically found in deep underground reservoirs formed by porous rock. Natural gas is used in residential, commercial and industrial applications. It is the dominant energy source used for home heating with slightly more than one half of American homes (66 million) using gas. Natural gas is considered the cleanest burning fossil fuel, producing primarily CO_2, water vapor and small amounts of nitrogen oxides (NO_X). The natural gas system entails gas wells, gas processing, compressor stations, gas storage, transmission lines, distribution system, and the end users.

Processing natural gas begins by collection in wells then processing at that collection point for removal of free liquid water and natural gas condensate. The natural gas condensate may be transported to an oil refinery where the water is disposed of as waste and the raw gas is separated and piped to a processing plant where it is purified by removing acid gases, such as hydrogen sulfide (H_2S) and CO_2. Typically, natural gas extracted from California gas fields has little condensate, and most processing is performed at the extraction site or at a processing plant. The acid gases are removed by amine treating or membrane which is then routed into a sulfur recovery unit. There are many processes used for conversion. The next step in gas processing plant is to remove water vapor from gas using glycol dehydration. The dehydrator may release aromatic organic chemicals to the atmosphere. Mercury and N_2 are then removed using the adsorption process. The next step is recovering the natural gas liquid. The residue gas from natural gas liquid is the final purified sales gas which is piped to the customer or end user.

a) Reasonably Foreseeable Compliance Responses

Reasonably foreseeable compliance responses to meet post-2020 emissions requirements from oil and natural gas systems would be similar to those described in the 2010 FED, summarized as follows.

- Oil producers in California have installed cogeneration facilities in production fields where steam flood enhanced oil production is practiced. The excess thermal energy from steam generation is used to produce electricity, thus significantly increasing the efficiency of production.

- In the gas production and processing sectors, U.S. EPA has published many GHG reduction strategies as part of their Natural Gas STAR and Methane to Markets programs. Projects such as the replacement of high bleed pneumatic control devices with low or no-bleed devices, and green well completions where gas that was previously vented is captured and utilized, have been demonstrated to significantly reduce GHG emissions of methane. These emission mitigation projects also recover significant quantities of marketable gas and have been shown to have short pay-back periods (months to a few years).

- CO_2 emissions from steam generators and process boilers can be reduced through the energy efficiency compliance response that would include improved inspection and maintenance and upgrading aged equipment.

- Methane emissions from oil and natural gas systems are primarily the result of normal operations and system disruptions. The vast majority of these emissions are not covered by the Cap-and-Trade Regulation, though some are addressed or will be addressed by other proposed ARB or federal rules. The limited subset of these emissions that have a Cap-and-Trade compliance obligation, from certain recently installed high-bleed pneumatic valves, can be cost-effectively reduced by upgrading technologies or equipment.

9. Petroleum Refining

A petroleum refinery can include all of the processes necessary to produce gasoline, aromatics, kerosene, distillate fuel oils, residual fuel oils, lubricants, asphalt, or other products through distillation of petroleum or through redistillation, cracking, rearrangement or reforming of unfinished petroleum derivatives. California petroleum refineries process crude oil into transportation fuels, lubricants, asphalt, petroleum feedstocks, and other products through a series of energy intensive distillation, cracking, and reforming processes.

The main refining process is called simple distillation and separates crude oil into "fractions" with different boiling point ranges. The crude oil is heated and sent to a distillation column where various petroleum products (i.e., the fractions) are recovered.

At the lowest temperatures, light liquids such as liquid petroleum gas (LPG), naphtha, and "straight run" gasoline are recovered. Jet fuels, kerosene, distillates (such as home heating oils and diesel fuels) are considered middle products. Heavy products including residuum and residual fuel oil are recovered at temperatures greater than 1,000ºF.

Following crude distillation, further processing converts heavy, low-valued feedstock into lighter, higher output fuels. For example, a catalytic cracker accepts gasoil which is a heavy distillate output from crude distillation as its feedstock and produces finished distillates such as heating oil, diesel, and gasoline. A reforming unit is used to produce higher octane products (such as various additives for gasoline) from lower-octane feedstock. Residue or residuum is the heaviest output from the distillation process and is used to produce petroleum coke.

a) Reasonably Foreseeable Compliance Responses

Reasonably foreseeable compliance responses to meet post-2020 emissions requirements from petroleum refining would be similar to those described in the 2010 FED, summarized as follows.

- Because petroleum refining requires large inputs of thermal energy, heat recovery and cogeneration of electricity can significantly improve refinery energy efficiency and reduce GHG emissions.
- Reduction of combustion emissions through energy efficiency improvements is a reasonably foreseeable compliance response that could reduce GHG emissions from refineries. However, each refinery is unique and the selected compliance response(s) would vary depending on individual circumstances.
- Possible measures to reduce CO_2 emissions from combustion includes modernization or retrofitting combustion facilities with more efficient equipment, improving insulation, maintaining and fixing leaks both thermal and physical, or improving burner efficiency. Possible strategies to reduce emissions for compressor, blowers, and other movers would be to retrofit boilers and process heaters for improved efficiency. Possible actions to reduce CO_2 emissions from flaring include fixing steam traps, increasing efficiency of the flare gas recovery, and installing fluid catalyst cracker turbines.

10. Pulp and Paper Manufacturing

The pulp and paper manufacturing covered entity applies to facilities that produce pulp either at stand-alone pulp facilities or integrated pulp and paper mills. The main processes of pulp and paper manufacturing are wood debarking and chip making, pulp manufacturing, pulp bleaching, paper manufacturing, and fiber recycling.

a) Reasonably Foreseeable Compliance Responses

Reasonably foreseeable compliance responses to meet post-2020 emissions requirements from pulp and paper manufacturing would be similar to those described in the 2010 FED, summarized as follows.

- Reduction of combustion emissions through energy efficiency improvements is a reasonably foreseeable compliance response that could reduce GHG emissions from pulp and paper plants. Possible measures to reduce CO_2 emissions from combustion includes modernization or retrofitting combustion facilities with more efficient equipment, improving insulation, maintaining and fixing thermal and physical leaks, and improving burner efficiency.

11. Electricity Self-Generation

The bulk of electricity generated in California originates from four primary source types: gas-fueled power plants, nuclear power plants, large hydroelectric dams, and renewable sources. Utilities distinguish between baseload power generation, which refers to power plants that run at least 60 or 70 percent of the time, and peakload, which is provided by facilities that generate electricity only to augment baseload during times of high demand. Natural gas, nuclear, and imported power (see next section) from coal plants form most of the baseload supply. Electricity generation would be subject to compliance requirements based on the GHG "content" of megawatt-hours (MWH) of electricity delivered to the California grid. The compliance obligation for cogeneration facilities (i.e., CHP) would be determined based on actual emissions reported.

While energy efficiency and distributed generation reduce system electricity demand, leading to reduced CO_2 emissions, supplanting fossil generation with utility scale renewable power on the "supply side" also significantly reduces CO_2 emissions. The Renewable Portfolio Standard (RPS) requires that investor-owned utilities (IOUs), publicly-owned utilities (POUs), and retail sellers of electricity meet 33 percent of their retail sales with eligible renewable resources by 2020. Senate Bill (SB) 350, approved in October 2015, requires that amount of the electricity generated and sold to retail customers from eligible renewable sources be increased to 50 percent by 2030.

Electricity from renewable sources including solar, wind, and geothermal sources provide increasing contributions to the electricity supply but still represent a small portion of the total electrical generation, and only geothermal is considered a baseload (continuous) generator. Nonetheless, utilities usually accept all available renewable energy in order to comply with renewable standard requirements.

a) Reasonably Foreseeable Compliance Responses

Reasonably foreseeable compliance responses to meet post-2020 emissions requirements from electricity self-generation would be similar to those described in the 2010 FED, summarized as follows.

- GHG emissions from electricity generating facilities may be reduced by increasing the efficiency of electricity generation to require less fuel input per unit of energy output. Highly efficient combined cycle power generation technology includes a primary gas turbine(s), and uses "waste heat" from the main gas turbine(s) to produce steam, which is then used to drive a steam turbine to generate additional electricity. Some natural gas power plants may be retrofitted or repowered to improve efficiency, reducing GHG emissions per megawatt hour (MWH).

- Several post-combustion CO_2 control technologies are currently being researched, including the use of solvents, solid sorbents, and membranes. However, separation of CO_2 from power plant exhaust gas at large scale is technically challenging. Therefore, this approach is not expected to play a significant role in complying with the Cap-and-Trade Program, at least in the next decade.

- The development of household appliances and systems that consume less energy are considered efficiency improvements that would occur at the consumer level. Energy conservation refers to the reduced demand for electricity which would result in less electricity being generated, producing a commensurate reduction in emissions at power plants. A portion of the reduced demand for electricity would be achieved by the introduction of energy efficient consumer products.

- Finally, renewable power generation (and potentially other low-carbon sources) can supplant some fossil fuel generation and emissions. It is expected that all but the smallest utilities would be required to build and access sufficient renewable generation to meet the requirements of the RPS and SB 350. However, there is a small potential for additional renewable generation to be built as a compliance response to the Proposed Project.

12. Stationary Combustion

For mandatory GHG reporting, the General Stationary Combustion (GSC) category includes facilities that are not already counted under other sectors such as cement plants, refineries, cogeneration or power plants. For the existing California reporting regulation, the 25,000 metric tons of carbon dioxide-equivalent ($MTCO_2e$) threshold includes both fossil fuel combustion and combustion of bio-based fuels such as landfill gas or biomass.

a) Reasonably Foreseeable Compliance Responses

Reasonably foreseeable compliance responses to meet post-2020 emissions requirements from stationary combustion would be similar to those described in the 2010 FED, summarized as follows.

- Fuel use could be optimized through the use of cogeneration operations by GSC facilities, in which waste heat energy is used to develop usable electrical energy. This not only reduces energy costs for the facility, but also offsets some of the need for electricity purchased from large fossil fuel power plants.

- Those facilities able to incorporate the use of biofuels, such as biomass or landfill gas, into their operations are able to further reduce their fossil fuel GHG emissions. For landfills and bio-digester systems, the flaring of methane substantially reduces GHG emissions by converting it to the less potent CO_2. Biogas facilities that combust the fuel to produce electricity reap even greater benefits because the methane is converted to CO_2 and is also used to produce relatively clean non-fossil energy.

- Energy efficiency improvements are the primary means of reducing emissions from stationary combustion facilities. Energy efficiency improvements are used to generally describe replacing aging equipment, retrofitting facilities, changing operational processes and/or procedures, changing fuels, and other actions that reduce fuel demand through more efficient combustion, increased heat production per fuel consumed, and reducing heat loss. The configuration and specific improvements installed at individual facilities would inevitably vary. Switching to less carbon-intensive or more efficient fuels can also reduce GHG emissions.

13. First Deliverers of Electricity

The Program covers emissions associated with both imported power serving California load and power generated in-state. A covered entity for in-state electricity generation is an entity who generates electricity in-state and delivers it to the California grid. For emissions associated with imported electricity, the covered entity would be the first entity to place power onto the California grid. Electricity deliverers are responsible for deliveries of both specified and unspecified electricity delivered to the California grid. These entities include electrical distribution utilities (those that sell electricity to retail customers) and marketers (those that buy and sell in the wholesale electricity market).

The nature of electricity markets means that some of the imported electricity cannot be linked to a particular power plant. Power plants must report to Federal agencies additional information that ARB would use to calculate emission factors associate with electricity from each specified power plant, (GHGs per MWh). ARB would provide emission factors for reporters to calculate and report emissions for particular categories of transactions.

a) Reasonably Foreseeable Compliance Responses

Reasonably foreseeable compliance responses to meet post-2020 emissions requirements from first deliverers of electricity would be similar to those described in the 2010 FED, summarized as follows.

- Importers of electricity may reduce their allowance obligation by importing electricity from renewable sources. The most likely compliance response is considered to be the purchase of allowances or offsets to meet surrender obligations.

14. Suppliers of Natural Gas

Natural gas deliverers are the distribution network for natural gas liquids throughout the state. Natural gas is used (combusted) by a wide range of end users for everything from household uses, agricultural operations, and industrial and commercial applications. The Cap-and-Trade Regulation requires that deliverers of fuels surrender allowances based on the amount of product that is delivered to end users.

a) Reasonably Foreseeable Compliance Responses

Reasonably foreseeable compliance responses to meet post-2020 emissions requirements from suppliers of natural gas would be similar to those described in the 2010 FED, summarized as follows.

- Strategies that could be practically implemented to reduce emission from the natural gas sector include encouraging a faster turnover of existing appliances to more efficient appliances (e.g., using "cash for clunkers" type programs) and increased use of biomethane. Surrendering allowances and/or offsets is expected to be the most likely compliance response to the Cap-and-Trade Regulation in this covered entity category.

15. Suppliers of Transportation Fuels (Petroleum Products)

Transportation fuel deliverers are the distribution network for transportation fuels throughout the state. As a whole, transportation fuels account for almost 40 percent of all CO_2 emissions in California. The largest seven suppliers, representing the major refiners, account for over 90 percent of all transportation fuel supplies. The key sources of GHG emissions are the combustion of transportation fuels in motor vehicles and to a lesser extent at stationary combustion sources.

Transportation fuels covered by the Cap-and-Trade Regulation are California gasoline, reformulated gasoline blend-stock for oxygen blending, California diesel, and oxygenates. Transportation fuels are used (combusted) by virtually everyone that operates an internal combustion engine. Rather than attempt to regulate fuel use by the vast number of end users, the fuel distribution network provides a logical and practical level at which to regulate GHG emissions resulting from the use regardless of the final consumer. The Cap-and-Trade Regulation would require that suppliers of transportation fuels surrender allowances proportionate to the amount of product that is delivered to end users.

a) Reasonably Foreseeable Compliance Responses

Reasonably foreseeable compliance responses to meet post-2020 emissions requirements from suppliers of transportation fuels (petroleum products) would be similar to those described in the 2010 FED, summarized as follows.

- Strategies that could practically be implemented to reduce emissions from the transportation fuel sector include the Low Carbon Fuel Standard (LCFS), increased vehicle fuel efficiency (Pavley regulation), improved land use planning (SB 375), and increased use of mass transit and non-motorized transportation. GHG emissions in this covered entity are produced by combustion at the consumer level. Suppliers of transportation fuels are not significant emission sources and do not produce emissions that could be reduced. As an upstream provider, transportation deliverers would likely surrender allowances and/or offsets as their compliance response.

16. Deliverers of Natural Gas Liquids

Deliverers of natural gas liquids are the distribution network for natural gas liquids throughout the state. Natural gas liquids, such as propane and LPG, are used (combusted) by a wide range of end users for everything from household uses, agricultural operations, and industrial and commercial applications. The fuel distribution network is therefore a logical level at which to regulate GHG emissions resulting from the use of natural gas liquids regardless of the final consumer.

a) Reasonably Foreseeable Compliance Responses

Reasonably foreseeable compliance responses to meet post-2020 emissions requirements from deliverers of natural gas liquids would be similar to those described in the 2010 FED, summarized as follows.

- The Cap-and-Trade Regulation requires that deliverers of natural gas fuels surrender allowances based on the amount of product that is delivered to end users. Strategies that could be practically implemented to reduce emissions are limited. Limits on outdoor barbeques, replacement of LPG mobile sources with electric vehicles, and improved appliance/combustion efficiencies may be difficult to achieve. The expected compliance response would be the surrender of allowances and/or offset credits.

17. Suppliers of Carbon Dioxide

Commercial suppliers and transporters of CO_2 are involved in the sale and delivery of the gas; manufacturers are not included within this covered entity. While generally considered a waste product, there are many commercial uses for CO_2, such as:

- Beverage carbonation

- Metal fabrication
- Cleaning (e.g., in dry cleaning as a substitute for perchloroethylene)
- Solvent extraction (e.g., coffee decaffeination)
- Fire suppressant in fire extinguishers
- Pressurizing medium and propellant (e.g., aerosol food cans, target pistols, inflating life rafts)
- Spoilage retardant (e.g., packaging foods to retard oxidation during storage)
- Fumigant (e.g., grain)
- Refrigerating agent (e.g., dry ice)
- Manufacture of sodium carbonate which is used in the manufacture of glass, as a pH regulator (e.g., additive to pools), water softener or food additive (acidity regulator, anti-caking agent, stabilizer) and in various dyeing applications

High-purity CO_2 is obtained from naturally-occurring CO_2 reservoirs (none of which are located in California), extracted along with oil and gas, or recovered as a byproduct of other manufacturing activities, such as the fermentation of grain to make alcohol and the burning of limestone to make lime. It is also manufactured directly by burning carbonaceous fuels. Petroleum refineries are the primary source of the CO_2 that is commercially sold for industrial and commercial applications and consumption.

a) Reasonably Foreseeable Compliance Responses

Reasonably foreseeable compliance responses to meet post-2020 emissions requirements from suppliers of carbon dioxide would be similar to those described in the 2010 FED, summarized as follows.

- The CO_2 Supplier covered entity does not apply to CO_2 production or emissions, but rather to the amount of CO_2 that is directed for sale as a commercial product. Businesses subject to this covered entity category would not include CO_2 manufacturers. Because suppliers and deliverers do not have control over production and do not generate significant emissions, and the Cap-and-Trade Regulation does not include fugitive emissions, the requirement to surrender allowances would mean that these businesses would obtain allowances or offsets to satisfy their surrender obligations.

C. Compliance Responses under Existing Offset Protocols

The offset provisions of the Cap-and-Trade Regulation provide a cost-containment mechanism for the Cap-and-Trade Program and encourage investment in emissions reduction technology in uncapped sectors. Offset credits are tradable credits that represent GHG emission reductions that occur in locations or sectors not covered by the Cap-and-Trade Program. One offset credit is equal to one $MTCO_2e$ of GHG emissions. Covered entities can purchase offset credits generated through projects that reduce GHG emissions not covered by the cap as an alternative to decreasing their own emissions or purchasing allowances from other covered entities.

Six offset protocols have been approved by ARB and five offset protocols have been approved by Québec. Offsets may involve land use decisions for projects located on federal, state, or privately-owned lands and lands outside of the United States. They may involve project-specific environmental impacts. If an offset project is developed in California, any significant environmental impacts would be addressed through CEQA review of the project by the appropriate lead agency with primary approval authority over the action (such as the local government where a use permit may be required). If a federal partner is involved in formally establishing an offset in or out of California, compliance with the National Environmental Policy Act (NEPA) may be necessary. At this time, it would be speculative to identify individual offset project locations or to identify which federal or provincial agencies that would be involved in regulatory oversight of offset project in the United States and Canada.

Offsets must meet rigorous criteria that demonstrate that the emission reductions are real, permanent, verifiable, enforceable, and quantifiable. To be credited as an offset, the action or project must also be additional to what is required by law or regulation or would otherwise have occurred under a conservative business-as-usual scenario. Issuance of offset credits occurs for projects complying with the Regulation and any project type specific requirements of the applicable ARB adopted protocol, and is a ministerial decision (i.e., deemed approved if in compliance with the prescribed set of requirements in the protocol without further exercise of discretion).

Four offset protocols were approved as part of the 2010 FED: Compliance Offset Protocol U.S. Ozone Depleting Substances (ODS), Compliance Offset Protocol Livestock Projects, Compliance Offset Protocol Urban Forest Projects, and Compliance Offset Protocol U.S. Forest Offset Projects. Since that time, the Board has approved amendments to all but the Urban Forest Protocol. The Compliance Offset Protocol U.S. Forest Projects was updated in 2014 (ARB 2014b) to revise quantification methodologies and common practice values, and in 2015 (ARB 2015a), to further revise quantification methodologies and to include Alaska. In 2014, the Board approved amendments to the Compliance Offset Protocol for Livestock Projects and ODS Projects to adopt a format consistent with regulatory documents and clarify certain quantification and monitoring requirements and data substitution methods. In addition, offset protocols were approved for Mine Methane Capture (MMC) Projects (ARB 2013b)

and Rice Cultivation Projects (ARB 2014a). An overview of the six ARB-approved protocols, one Québec-specific offset protocol, and their reasonably foreseeable compliance responses are summarized in this section.

The anticipated compliance responses to various actions discussed in this section focus on those activities with the potential to result in either a direct or indirect physical change in the environment. These include construction activities, infrastructure and equipment installations, and significant operational changes to facilities. While purchasing of compliance instruments is a reasonably foreseeable compliance response, it would not result in direct physical effects on the environment.

1. Synopsis of the Compliance Offset Protocol for Ozone Depleting Substances Projects

ARB's Compliance Offset Protocol for ODS Projects establishes the criteria for destruction of ODS that would be eligible for issuance of offset credits. ODS refers to a large group of chemicals known to destroy the stratospheric ozone layer when released into the atmosphere; they also have high GWP ranging from several hundred to over ten thousand times that of CO_2 (IPCC 2007). ODS have historically been used in a wide variety of applications including refrigerants, foam blowing agents, solvents, and fire suppressants. The types of ODS eligible under this protocol consist of the following:

- Refrigerants (used for industrial/commercial refrigeration, cold storage, and air conditioners.)
- Eligible refrigerants: chlorofluorocarbon (CFC)-11, CFC-12, CFC-13, CFC-113, CFC-114, and CFC-115
- Foam blowing agents (used as insulation in refrigerators, buildings, air conditioners, and other appliances)
- Eligible foam blowing agents: CFC-11, CFC-12, hydrochlorofluorocarbon (HCFC)-141b, and HCFC-22

The United States, in compliance with the Montreal Protocol, is phasing-out the production and importation of ODS. The eligible gases under this protocol have been phased out of production and importation in the United States for those uses. CFCs were phased-out in 1996 and the HCFCs were phased-out for foam use at the beginning of 2010. Although the eligible gases can no longer be produced or imported, the current supply of these substances may continue to be recovered, recycled, reclaimed, and reused. In addition, there are no regulations that require the recovery and proper destruction of these substances to prevent the release of ODS to the atmosphere at the end of their life cycle. For foams, these materials are shredded and disposed of at landfills, where a portion would leak to the atmosphere. Refrigerants are

expected to be reclaimed and/or recycled and eventually emitted through leakage from equipment.

Under this protocol, offset credits would be issued for destruction of ODS at an eligible destruction facility in the United States (either a facility that has received a Resource Conservation and Recovery Act permit for the destruction of ODS or meets United Nations guidelines). Destruction outside the United States would not be accepted for credit under this protocol. All ODS eligible for offset credits must originate in banks currently residing within the United States. Eligible refrigerant ODS may be collected from industrial, commercial, or residential equipment, systems, appliances or stockpiles. Eligible foam ODS may either be extracted from appliance foams and destroyed in a concentrated form or destroyed as intact foam source from building insulation. Concentrated foam blowing agent ODS must be extracted under negative pressure and then collected, stored, and transported in cylinders or other hermetically sealed containers. Likewise, intact foam that is separated from building panels must be stored, transported, and destroyed in sealed containers. Further, all destruction activities must be conducted in accordance with the Clean Air Act and must achieve 99.99 percent destruction efficiency.

a) Ozone Depleting Substances Offset Protocol Compliance Responses

Under the ODS Offset Protocol, it is expected that the following compliance responses would be reasonably foreseeable.

- Available capacity at existing United States ODS destruction facilities would be utilized. Adequate capacity exists at the six existing ODS destruction facilities to handle ODS destruction pursuant to this offset protocol.

- Transport of ODS to the ODS destruction facilities would occur, resulting in transportation emissions. ODS transport may occur by truck, rail, waterborne craft, or aircraft.

- Incineration is an existing technology for destruction, so emissions from combustion would occur, potentially including TACs and PM. In addition, a small fraction of ODS would be emitted due to incomplete destruction. ODS incinerators are generally required to include substantial pollution controls as part of the permitting process. Any non-incineration technologies would meet TEAP guidelines on emissions, which are in-line with RCRA standards. With the destruction of ODS refrigerants, there would be increased use of corresponding substitute refrigerants.

- With the extraction of foam blowing agents and the destruction of intact ODS-containing foams, there would be decreased quantities of ODS released from appliance and foam shredding, and foam landfilling.

Under the ODS Offset Protocol, no new ODS destruction facilities would be constructed due to the high cost of developing such facilities, stringent permitting requirements, and the limited supply of ODS that would qualify for destruction (e.g., expected to be exhaustible within approximately 5 years of program initiation). ODS offset projects implemented under the ODS Offset Protocol would utilize any of the five existing incinerators with a RCRA permit or the non-RCRA facility that meets the standards established by TEAP. Sufficient capacity has been identified at the five RCRA-permitted ODS incinerators able to accept ODS materials generated by the adoption of this offset protocol. No new or expanded facilities would be required. The inclusion of non-RCRA facilities that meet TEAP standards would increase available destruction capacity and would not be expected to result in any significant impact differences compared to an impact analysis of RCRA-permitted facilities only.

2. Synopsis of the Compliance Offset Protocol for Urban Forest Projects

Under ARB's Compliance Offset Protocol Urban Forest Projects, urban tree plantings would increase in urbanized areas to permanently increase carbon storage in woody tissues. Urban forests can reduce atmospheric CO_2 directly and indirectly. As trees grow throughout their lifetime, they remove CO_2 from the air through photosynthesis, resulting in carbon sequestration within the plant tissues. This process involves transforming CO_2 into carbon, which is then used to create living matter—leaves, stems, trunk, roots (CAR 2010). Offset credits may be issued for the carbon sequestration associated with increasing tree stocks in urban areas. While urban forests also have potential additional indirect GHG-reducing benefits, such as decreased demand for air conditioning use and energy through a reduction of building heat gain, these indirect GHG reductions are not verifiable and consequently not eligible for offset credits.

Urban forest offset projects are a planned set of tree planting and maintenance activities to permanently increase carbon storage, taking into account GHG emissions associated with planting and maintenance of project trees. The tree planting projects must be implemented by local municipalities, educational campuses, or utilities. Urban forest tree planting projects do not apply to large natural forest tracts (greater than 100 acres). To qualify for offset credits, the tree planting project must occur within the United States and the trees must be planted within the boundaries

- *Municipality* – along streets, in parks, municipal golf courses, cemeteries, parking lots, and other public open space areas, on private properties, and near municipal buildings and greenbelts.
- *Educational campuses* – along streets, near dorms, office buildings, recreational fields, and in parking lots, arboretums, and other open space areas.

- *Utility* – in parks, parking lots, within private property, along streets, and within open space areas (e.g., utility corridors or other property owned by utility agencies).

To be eligible to receive offset credits, municipalities and educational campuses must obtain a net gain (i.e., new plantings must be greater than trees removed under the program) in the number of trees and tree carbon stocks. For utilities, trees planted that replace those removed during line clearance operations or are planted for energy conservation are eligible for offset credits. All trees included in the project must be in addition to or not subject to federal, state, or local tree planting regulations. To be eligible for offset credits, the project must also meet the following criteria:

- Provide a tree maintenance and monitoring plan;
- Record the spatial location of all tree planting sites with global positioning system software or geographic information system software;
- Calculate the CO_2 sequestration achieved from growing eligible planted trees;
- Account for the CO_2 emissions that would be generated to deliver and plant trees and ongoing maintenance activities;
- Plan for a project lifetime of 100 years following the issuance of offset credits; and
- Plant trees with an average spacing no less than 5 meters (approximately 15 feet).

If eligible, the project could be issued offset credits for a period of 25 years with unlimited renewals. In general, carbon sequestration from urban forests can range from 16 kilogram per year (35 pounds per year) for small, slow-growing trees with 8 to 15 centimeters diameter at breast height (dbh) (3 to 6 inches dbh) to 270 kilogram per year (600 pounds) for larger trees growing at their maximum rate. Tree planting projects that are larger (i.e., approximately 1,000 tree sites) may offer greater economies of scale in achieving carbon sequestration.

a) Urban Forest Offset Protocol Compliance Responses

Under the Urban Forest Offset Protocol, it is expected that the following reasonably foreseeable compliance responses would occur:

- Urban forest offset project developers (i.e., municipalities, educational campuses, utilities, and partner organizations) would implement tree planting projects that would qualify for offset credits.

- New trees would be planted at an average spacing of no less than 5 meters along streets, near buildings, in open space areas, and on public and/or private properties. Trees would not be planted in large natural contiguously forested areas (≥ 100 acres and containing dead and downed woody material) within municipalities. In such areas, the U.S. Forest Offset Protocol would apply.

- Landscape installation activities would include the delivery of trees to the selected site, hauling of soil and other planting materials, use of small construction equipment (e.g., small generators, post-hole diggers, etc.), and transport of construction workers to and from the site.

- Tree maintenance activities would include periodic transport of maintenance personnel and equipment, use of small hand tools to trim and maintain trees (e.g., chainsaw, trimmers, etc.).

- Fertilizers and pesticides could be applied using standard techniques and safety protocols.

- Tree planting would occur in accordance with local planning policies and zoning ordinances, which often include protection of solar access, where appropriate.

- Trees planted for summer shading of buildings could create co-benefits related to reduced heat gain and attendant decreased energy demand for air conditioning.

- Tree species selection would be influenced by proper urban tree criteria, including compatibility with urban stresses and growing conditions, pollen and allergy sensitivity, and emissions.

The cost of GHG generating offsets from urban forest projects is relatively high, compared to other offset strategies, which may limit their implementation; however, because urban trees can provide multiple co-benefits (e.g., aesthetic, habitat, air quality, heat island cooling, etc.), urban forest offset projects are expected to occur despite the relatively high cost of project implementation.

3. Synopsis of the Compliance Offset Protocol for Livestock Projects

Under ARB's Compliance Protocol Livestock Projects, digester projects would be implemented to better manage manure on dairy cattle and swine farms, which would result in the reduction of GHG emissions from these facilities. Manure treated and stored under anaerobic conditions decomposes to produce methane, which, if uncontrolled, is emitted to the atmosphere. This situation predominantly occurs when livestock operations manage waste with anaerobic liquid-based systems (e.g., in lagoons, ponds, tanks, or pits). Installation of a digester system allows for the captures of methane from anaerobic manure treatment and/or storage facilities on livestock

operations. Under this protocol, the methane that would have been emitted to the atmosphere in the absence of the project is destroyed on-site (by flaring), transported for off-site use (e.g., through gas distribution or transmission pipeline), or used to power on-site stationary combustion devices.

A livestock digester project would qualify for the issuance of offset credits if the offset project meets the criteria in the protocol and Regulation, including the following:

- Is located within the United States or United States territories;
- Defines baseline anaerobic operational conditions; and
- GHG reductions yield a surplus above and beyond the business-as-usual conditions;

Under this offset protocol, reductions in methane and CO_2 would be accounted for in determining project emissions and emission reductions. Methane would be captured by the digester system and could be used in place of fossil fuels to power on-site stationary combustion devices, such as generators or pumping systems, or the project could alter the need to transport manure waste for off-site disposal. Avoided electricity emissions do not count toward the number of offset credits a project may be issued. In addition to methane, this protocol accounts for changes in direct CO_2 emissions from mobile and stationary combustion sources within the assessment boundary, which can either increase or decrease depending on project and farm specifics. CO_2 emissions from digesters are considered biogenic emissions and are not included in the GHG reduction calculation.

Digesters are one element of a biogas control system (BCS). In addition to the digester, these systems typically include a gas-handling system (e.g., pipeline), a gas-use device (e.g., flare or electric generation system), and a manure storage tank or pond to hold the treated effluent prior to land application or hauling off the site. The solids remaining after the digestion process can be used as a soil amendment or as animal bedding. BCSs can accommodate manure handled as a liquid, slurry, or semi-solid (with little or no bedding added) and are best suited at facilities that have stable year-round manure production and collect at least 50 percent of the manure daily. The size of the system is determined primarily by the number and type of animals served by the operation, the amount of dilution water added, and the desired retention time.

There are three main types of commercial BCS that have been used to manage manures of varying solids contents: covered lagoon digesters, complete mix digesters, and plug flow digesters. A covered lagoon digester is an earthen lagoon fitted with a cover that collects biogas as it is produced from the manure. A complete mix digester is a tank, constructed of either reinforced concrete or steel, with a gas-tight cover. The digester contents are mixed periodically, either by a motor-driven impeller or a pump. A

plug flow digester is a long, relatively narrow tank, often built below ground level, with a gas-tight cover and is only used for dairy manure.

Plug flow and complete mix digesters are typically heated systems that operate at a constant temperature year-round, producing stable gas production rates that support gas-to-energy applications in all climates. Heated digesters must be situated so that they can be heated, usually with hot-water piping running in and out of the digester tank. It may be possible to heat the water using the methane produced by the digester. The tanks should also be insulated to help it retain optimal operating temperatures. Partially burying tanks in the ground or piling soil up against the sides of the tank help to insulate the tank.

Covered lagoon digesters are not heated, and this can affect gas production rates. In warmer climates, gas production is relatively stable during all seasons and can be used for energy gas uses. However, in colder climates, gas production from covered lagoon digesters is lower during winter months and gas use may be limited to flaring.

Biogas produced by the BCS is primarily methane and CO_2, with traces of H_2S, and other gases. Use of raw biogas in heating equipment and in internal combustion engines may cause early failures because of the corrosive nature of the H_2S and water vapor. Therefore, biogas should be properly cleaned using appropriate scrubbing and separation techniques before use.

a) Livestock Offset Protocol Compliance Responses

Under the Livestock Offset Protocol, it is expected that the following reasonably foreseeable compliance responses would occur:

- New digester facilities would most likely be constructed at or adjacent to existing livestock operations (e.g., dairy cattle and swine farms) and, though less likely, it is possible that new digester facilities could be constructed in communities at locations central to participating livestock operations. These new community digester facilities would still be anticipated to be relatively near existing livestock operations in existing agricultural areas.

- Facility footprint areas would be cleared of debris or other landscaping.

- Construction activities may include: site grading; trenching; foundation preparation; construction of digesters, holding tanks, and/or buildings; installation of underground pipelines; delivery of materials and construction equipment; and transport of construction workers to and from the site.

- Operational activities would include transport of maintenance personnel and equipment to and from the facility. The operation of community digester facilities could also include the transport of manure from nearby livestock operations.

- Some digester types would require energy to mix and/or heat the wastes.
- Heated digesters could also destroy pathogens. The use of digesters could help to prevent untreated manure from reaching ground water.
- Biogas could be used to replace purchased energy for electricity, heating, or cooling. For most farms, the most profitable biogas use option would be to fuel an internal combustion engine or gas turbine driven generator to produce electricity. Other options include using biogas to fuel forced air furnaces, direct fire room heaters, and adsorption chillers.
- Recovering waste heat from biogas powered engines could provide heat or hot water for farm use.
- If gas combustion is used, emissions such as NO_x would occur. The locations of new digester facilities could be influenced by air quality regulations, if an area is out of attainment for ozone precursors.
- Livestock wastes may be hauled from the site.

4. Synopsis of the Compliance Offset Protocol for U.S. Forest Projects

Under ARB's Compliance Offset Protocol U.S. Forest Projects, reforestation, avoided conversion, and improved forest management projects would be implemented that would result in increased carbon sequestration and/or avoided emissions. The net effects of GHG reductions and removal enhancements would be calculated and used in issuing offset credits.

Trees, through the process of photosynthesis, naturally absorb CO_2 from the atmosphere and store the gas as carbon in their biomass (i.e., trunk [bole], leaves, branches, and roots). Carbon is also stored in the soils that support the forest, as well as the understory plants and in dead wood and litter on the forest floor. Wood products that are harvested from forests can also provide long term storage of carbon, such as in building materials that are in place for decades.

When trees are disturbed through natural events like fire, disease, and pests or through human influences (e.g., harvest, fire fuel management, controlled burns), some of their stored carbon may oxidize or decay over time releasing CO_2 into the atmosphere. The quantity and rate of CO_2 that is emitted may vary depending on the specific situation. Forests function as reservoirs in storing CO_2. Forests have the capacity to both emit and sequester CO_2. If not properly managed, forests can be a net source of emissions over finite time frames; however, with appropriate management techniques, forests can sequester CO_2 and be a sink for GHG emissions in the short and long term.

Under the U.S. Forest Offset Protocol, a forest project is defined as: "A planned set of activities designed to increase removal of CO_2 from the atmosphere, or reduce or prevent emissions of CO_2 to the atmosphere, through increasing and/or conserving forest carbon stocks." The U.S. Forest Offset Protocol requires that credited GHG reductions or removals be additional to any reductions or removals required by law or regulation, or that would otherwise occur under a conservative business as usual scenario. The U.S. Forest Offset Protocol specifies a legal-requirement test and a performance test that are used to determine project eligibility and set the project baseline for crediting for each project type. Projects that qualify under this offset protocol and meet the requirements as described above would be eligible to generate offset credits for a crediting period of 25 years, which can be renewed in 25-year increments. However, as a condition of renewal, projects would be required to use the latest protocols at the time of renewal to quantify GHG emission reductions. Project owners are also required to monitor the success of the project for a period of 100 years following the issuance of the latest offset credit to ensure the permanence of credited reductions. Further, the projects must undergo verification by an ARB-accredited verification body at least every six years.

Under the 2010 FED, the U.S. Forest Projects were limited to the lower 48 States. In June 2015, an amendment was approved to expand the area eligible for forest projects to the state of Alaska. An EA was prepared and adopted reflecting these changes. Additional amendments were adopted in June 2015 related to language clarifications, assessment practices, and other changes that were not subject to environmental review. There are three types of forest projects that would qualify under the protocol on public or private lands, as described below. All forest projects must occur within the contiguous United States and Alaska.

a) U.S. Forest Offset Protocol Compliance Responses

Under the U.S. Forest Offset Protocol, it is expected that the following reasonably foreseeable compliance responses would occur: reforestation, forest management projects, and forest protection (avoided conversion) projects would be implemented. The reasonably foreseeable compliance responses that would occur under each of these project types are described below:

i) Reforestation

Reforestation involves restoring tree cover on land that is not at optimal levels and has minimal, short-term (30-year) commercial opportunities. A reforestation project is only eligible if:

- The project is located in the United States.
- The project involves tree planting or removal of impediments to natural reforestation on land that:

    - Has had less than 10 percent tree canopy cover for a minimum of 10 years; or
    - Has been subject to a significant disturbance (e.g., natural event) that has removed at least 20 percent of the land's above-ground live biomass.

- No rotational harvesting of reforested trees or any harvesting of pre-existing carbon in live trees occurs during the first 30 years after project commencement unless such harvesting is needed to prevent or reduce an imminent threat of disease.
- The tree planting, or removal of impediments to natural reforestation, does not follow a commercial harvest of healthy live trees that has occurred in the project area within the past 10 years.
- The project does not employ broadcast fertilization.
- The project does not take place on land that was part of a previously registered forest project, unless the previous forest project was terminated due to an unintentional reversal.

ii) Improved Forest Management

Improved forest management includes management activities that maintain or increase carbon stocks on forested land relative to baseline levels of carbon stocks. An improved forest management project is only eligible if:

- The project is located in the contiguous United States or applicable locations in Alaska;
- The project takes place on land that has greater than 10 percent tree canopy cover.
- The project employs natural forest management practices.
- The project does not employ broadcast fertilization.
- The project does not take place on land that was part of a previously registered forest project, unless the previous forest project was terminated due to an unintentional reversal.
- Eligible management activities may include, but are not limited to:
    - Increasing the overall age of the forest by increasing rotation ages.

- Increasing the forest productivity by thinning diseased and suppressed trees.
- Managing competing brush and short-lived forest species.
- Increasing the stocking of trees in understocked areas.

iii) Avoided Conversion

Avoided forest conversion involves preventing the conversion of forest land, which is defined as supporting at least 10 percent tree canopy cover, to a non-forest land use by dedicating the land to continuous forest cover through a qualified conservation easement or transfer to public ownership. While these projects prevent the conversion of forest lands to a non-forest land use, they do not preclude ongoing forest management and may involve tree planting and harvesting. An avoided conversion project is only eligible if:

- The project is located in the contiguous United States or applicable locations in Alaska;
- The private forest owner can demonstrate that there is a significant threat of conversion of project land to a non-forest land use, through a demonstration that an identified non-forest land use is of significantly higher value through a real-estate appraisal, and through a demonstration of the legal permissibility of the alternative land use.
- The project does not employ broadcast fertilization.
- The project does not take place on land that was part of a previously registered forest project, unless the previous forest project was terminated due to an unintentional reversal; and
- An avoided conversion project can only occur on land that is privately-owned prior to project commencement and is entirely covered by a qualified conservation easement or transferred to public ownership.

5. Synopsis of the Compliance Offset Protocol for Rice Cultivation Protocol

The Rice Cultivation Protocol incentivizes the reduction of GHG emissions resulting from existing traditional rice cultivation practices in the United States. The Rice Cultivation Protocol would allow for the issuance of carbon offset credits for emission reductions achieved from alternative rice cultivation practices that reduce methane emissions to the atmosphere. Methane emissions at rice farms occur as a result of methanogen activity under anaerobic conditions, which are caused by maintenance of flooded conditions in rice fields during the growing season.

The Rice Cultivation Protocol provides project definitions, eligibility rules, conservative GHG emission reduction quantification methodologies and offset monitoring, and reporting and verification instructions.

Due to the inherent complexities of measuring the soil biogeochemical processes identified above, the Rice Cultivation Protocol uses the DeNitrification-DeComposition (DNDC) biogeochemical process model to quantify net methane reductions. The DNDC model is a computer simulation that addresses carbon and nitrogen biogeochemistry in agro-ecosystems. It was originally developed for predicting carbon sequestration and trace gas emissions for non-flooded agricultural lands, simulating the fundamental processes controlling the interactions among various ecological drivers, soil environmental factors and relevant biochemical or geochemical reactions, which collectively determine the rates of trace gas production and consumption in agricultural ecosystems. Detail of management (e.g., crop rotation, tillage, fertilization, manure amendment, irrigation, and weeding) have been parameterized and linked to the various biogeochemical processes (e.g., crop growth, litter production, soil water infiltration, decomposition, nitrification, denitrification, etc.) embedded in DNDC. The model can be used for predicting crop growth, soil temperature and moisture regimes, soil carbon dynamics, nitrogen leaching, and emissions of trace gases including nitrogen, nitric oxide, ammonia, methane, and, CO_2. At this time the DNDC model has only been calibrated for the major rice growing regions in California and the Mid-South (e.g., Arkansas, Missouri, Mississippi, and Louisiana); therefore, only these regions are eligible to use the Rice Cultivation Protocol.

a) Rice Offset Protocol Compliance Responses

The Rice Cultivation Protocol allows for three types of eligible project activities and associated compliance responses that would result in a reduction in total flooding time and associated anaerobic conditions during the growing season and, thus, would result in a net decrease in methane emissions: Dry Seeding Activities; Early Drainage in Preparation for Harvest Activities; and Alternate Wetting and Drying Activities.

- **Switch from Wet Seeding to Dry Seeding:** Dry seeding is a seeding method that involves sowing of seeds into dry or moist seedbed by drilling or broadcasting. Dry seeding would result in an additional seven to ten non-flooded days during the cultivation season, compared to wet seeding methods. Only dry seeding activities located in the California Rice-Growing Region would be eligible for crediting under the Rice Cultivation Protocol.

- **Early Drainage in Preparation for Harvest**: This practice applies to rice cultivation practices that drain standing water from rice fields earlier than an established baseline drainage date. This would typically occur seven to ten days earlier than under existing methods. Early Drainage in Preparation for Harvest activities located in both the California and Mid-South (i.e., Arkansas, Missouri, Mississippi, and Louisiana) Rice Growing Regions would be eligible for crediting under the Rice Cultivation Protocol.

- **Alternate Wetting and Drying of the Rice Field**: This practice would allow flooded fields to partially evaporate and then be re-filled on a cyclical basis, rather than maintaining a specific water depth throughout the season. Only Alternate Wetting and Drying activities located in the Mid-South Rice Growing Region would be eligible for crediting under the Rice Cultivation Protocol.

6. Synopsis of the Compliance Offset Protocol for Mine Methane Capture Protocol

The MMC Protocol incentivizes the reduction of GHG emissions resulting from mining activities in the United States. The MMC Protocol will allow for the issuance of carbon offset credits for emission reductions achieved from the installation and operation of a device or set of devices that capture and destroy methane that would otherwise be released into the atmosphere as a result of mining. The uncontrolled venting of methane occurs at active underground mines, active surface mines, and abandoned underground mines. Methane can be released both as ventilation air methane (VAM) through ventilation shafts and as mine gas through methane drainage systems. Methane drainage systems are comprised of individual gas wells and boreholes.

The MMC Protocol provides project definitions, eligibility rules, conservative GHG emission reduction quantification methodologies, and offset project monitoring, reporting and verification instructions. Under this protocol, overall emissions and emission reductions in methane and CO_2 are accounted for in determining the net emissions reductions of an MMC project. In addition to methane emissions, the protocol accounts for the CO_2 emissions that result from the combustion of methane. CO_2 emissions that result from additional energy consumption by equipment used to collect, process, store and destruct methane are also accounted for as are fugitive emissions resulting from natural gas pipeline injection.

a) MMC Protocol Offset Compliance Responses

The MMC Protocol allows for four types of activity:

- Active Underground Mine Ventilation Air Methane Activities;
- Active Underground Mine Methane Drainage Activities;
- Active Surface Mine Methane Drainage Activities; and
- Abandoned Underground Mine Methane Recovery Activities

Captured methane must be destroyed via an eligible end-use management option (i.e. VAM oxidation, flaring, electricity or heat generation, injection into natural gas pipeline, production of transportation fuels, etc.) as defined in the Protocol. Active underground mine ventilation air methane activities, active surface mine methane drainage activities, and abandoned underground mine methane recovery activities may destroy the captured methane by any end-use management option. Active underground mine methane drainage activities may destroy captured methane by any end-use management option other than injection into a natural gas pipeline.

7. Approved Protocols in Québec

Québec has adopted five offset protocols:

- Protocol 1: Covered Manure Storage Facilities – Methane Destruction,
- Protocol 2: Landfill sites – Methane Treatment or Destruction,
- Protocol 3: Destruction of Ozone Depleting Substances Contained in Insulating Foam or Used as Refrigerants Removed from Refrigeration, Freezer and Air-Conditioning Appliances,
- Protocol 4: Active Coal Mines – Destruction of Methane from a Drainage System, and
- Protocol 5: Active Underground Coal Mines – Destruction of Methane from Ventilation Air.

Québec's Protocol 1 is similar to ARB's Compliance Offset Protocol Livestock Projects, described in section 2.C.3 of this document. Québec's Protocol 3 is similar to ARB's Compliance Offset Protocol Ozone Depleting Substances Projects described in section 2.C.1. Combined, Protocols 4 and 5 are similar to the portions of ARB's Compliance Offset Protocol MMC Projects related to destruction of methane from mine methane drainage and destruction of methane from ventilation air of active underground mines. ARB's protocols are described in section 2.C.6.

Under ARB's Cap-and-Trade Regulation, there is no protocol that addresses methane treatment and/or destruction at landfill sites (Québec's Protocol 2). However, similar types of compliance responses would be implemented to comply with ARB's Regulation to Reduce Methane Emissions from Municipal Solid Waste Landfills (ARB's Landfill Regulation) as Québec's Protocol 2. It is important to note that Québec's landfill protocol covers small landfills, whereas ARB's landfill regulation addresses large landfills. In addition, regulations are functionally different than offset protocols as the latter are voluntary rather than compulsory.

a) Synopsis of Protocol 2: Landfill Sites – Methane Treatment or Destruction

As landfill waste decomposes it generates methane and carbon dioxide. Québec's landfill gas protocol quantifies emission reductions from installing a landfill gas capture and destruction system. The protocol allows three types of capture and destruction technologies:

1. Methane destructed through an enclosed flare, open flare, electricity generation, or thermal energy production on site;

2. Methane transported offsite for direct-use or pipeline injection destruction; and

3. Methane used onsite or offsite as a vehicle fuel.

b) Québec Protocol 2 Land Sites Compliance Responses

Reasonably foreseeable compliance responses associated with Québec's Protocol 2 involve installation of gas collection and control systems. This would generally involve placement of pipelines within existing landfills and various types of equipment that would be designed to avoid emission of methane to the atmosphere, such as flares or routing to pipelines. Gas system components may involve the installation of wells and pumps, and well as trenching for pipelines. These activities would be anticipated to occur within landfill boundaries in existing disturbed areas.

D. Proposed Recommended Actions and Reasonably Foreseeable Compliance Responses

The following section summarizes the recommended actions and the reasonably foreseeable compliance responses resulting from implementation of the Proposed Project. The anticipated compliance responses to various actions discussed in this section focus on those activities with the potential to result in either a direct or indirect physical change in the environment. These include construction activities, infrastructure and equipment installations, and significant operational changes to facilities. While purchasing of compliance instruments is a reasonably foreseeable compliance response, it would not result in direct physical effects on the environment.

As of December 2015, the number of entities and facilities subject to Cap-and-Trade Program was estimated to include 319 businesses representing 475 facilities. The true number of entities at any given time is subject to continual change as new facilities open while existing facilities expand or reduce their operations. Suppliers of fuel and natural gas and electricity importers are also subject to the Regulation.

There are a total of 249 units that will be subject to CPP (upon completion of 3 units in late 2016). These 149 affected units will total 38,015 MWs of installed capacity, and will consist of 93 facilities owned by 67 different companies. These EGUs are located throughout California, with the majority in the South Coast, San Joaquin, Bay Area, and Mojave air districts. Essentially all affected EGUs are subject to the Cap-and-Trade Program.

1. Establish Post-2020 Caps

a) Summary of Proposed Amendment

The Proposed Project would set declining caps for the post-2020 Program. The initial cap level in 2013 was set at the level of emissions expected from covered sources for that year – at 162.8 million metric tons of carbon dioxide equivalent ($MMTCO_2e$). The

cap then declined to 159.7 $MMTCO_2e$ in 2014. In 2015, the program expanded to include GHG emissions from fuel suppliers, based on the level of GHG emissions expected from the covered fuels for the year 2015, resulting in a cap expansion in 2015 to 394.5 $MMTCO_2e$. The cap will continue to decline through 2020 under the current Regulation.

The level of the cap is critical to the environmental effectiveness of the Cap-and-Trade Program. If the cap is not set at a stringent enough level to drive GHG emission reduction activities, the environmental goals of the Program may not be met even if all sources comply with Program requirements. Staff designed the current Program to be sufficiently stringent to spur GHG emission reductions to achieve AB 32 goals. Staff set the cap for 2020 at 334.2 $MMTCO_2e$, which was designed to allow California to achieve the AB 32 target in 2020.

As with the current program, the levels of the post-2020 caps are critical to the environmental effectiveness of the Cap-and-Trade Program. Therefore, staff set the post-2020 caps to be sufficiently stringent to continue to spur GHG emission reductions to achieve AB 32 goals and the interim 2030 GHG reduction target. Staff set the cap for 2030 at 200.5 MMTCO2e, which represents about 80 percent of the statewide target. Additional details regarding the development of post-2020 caps may be found in the Staff Report for Proposed 2016 Cap-and-Trade Amendments.

b) Reasonably Foreseeable Compliance Responses

The 2010 FED detailed reasonably foreseeable compliance responses for each covered sector resulting from the Cap-and-Trade Program as originally proposed. These are summarized in this project description under section 2.B. Compliance Responses for Covered Entities.

Compliance responses from covered sectors generally include energy efficiency measures to reduce fuel consumption, switching to less carbon-intensive fuel, increasing combustion efficiency, upgrading aged equipment, installing cogeneration for more efficient production, altering a process to make production more efficient, changing the composition of a manufactured product to one that is less energy-intensive to manufacture, and sector-specific emission mitigation technologies.

Energy efficiency upgrades are generally the least expensive compliance option, and therefore, the most likely to have been implemented first. As the cap declines further post-2020, covered entities may need to implement other options to further reduce their emissions. An increase in electrification in the transportation sector is also expected to yield GHG reductions in this sector. Covered entities under the 2010 FED are described in Section 2.B.7

Declining caps are expected to yield increased investment in energy efficiency, equipment and process upgrades, and clean technology. Staff expects the continuation of the program post-2020 to yield similar compliance responses as the current program,

but to go further in implementing GHG reduction measures where feasible. This is particularly likely if the cost of compliance instruments continues to rise, increasing the economic favorability of installing equipment and process upgrades. Staff expects that a few covered sectors, such as nitric acid producers and fuel suppliers, that have limited options for reducing GHG emissions through their operations may opt to continue purchasing allowances or offsets as a less costly alternative to installing upgrades.

2. Extend Allowance Allocation Beyond 2020 and Incorporate Results of Leakage Studies for Post-2020 Allowance Allocation

a) Summary of Proposed Amendments

The Proposed Project may include post-2020 allocation for industrial entities, electrical distribution utilities, natural gas suppliers, public wholesale water agencies, legacy contract generators with industrial counterparties, universities, and public service facilities; updates to industry assistance factors for a post-2020 program; and targeted updates to product-based emissions efficiency benchmarks (Table 9-1 in the Regulation) for the third compliance period. These updates may be part of a 15-day comment period. Additional details on the development of a proposed methodology to allocate allowances to electrical distribution utilities, potential increased consignment of natural gas supplier allocated allowances, a proposed methodology to incorporate the results of leakage studies to inform allowance allocation, and the discussion of updates to product-based benchmarks may be found in the Staff Report for Proposed 2016 Cap-and-Trade Amendments.

b) Reasonably Foreseeable Compliance Responses

Methodologies, assistance factors, and product-based benchmarks used to calculate free allowance allocation may increase, decrease, or remain the same depending on the implementation of post-2020 allocation methodologies. Changes in methodologies, assistance factors, and product-based benchmarks will change the amount of freely allocated allowances received by covered entities. Covered entities in sectors experiencing a decrease in free allowance allocation are expected to respond by acquiring more compliance instruments at auction and by trading, and by more aggressively pursuing GHG emissions reductions through reducing fuel use, changing fuels, purchasing less GHG-intensive electricity, upgrading equipment, and other efficiency improvements that have been previously mentioned. Covered entities in sectors experiencing an increase in free allowance allocation are likely to respond by similar activities, but in a less aggressive manner. While any post-2020 allocation changes could alter the amount of free allowances required by covered entities to minimize leakage, no changes to types of compliance responses are anticipated. However, depending on amounts of free allowance allocations, the magnitude of compliance activities undertaken by covered entities to meet the cap may vary.

3. Linkage with Ontario, Canada

a) Summary of Proposed Regulation Amendments

The Proposed Project includes a framework for linkage to the Ontario, Canada market, which is currently under development for linkage with the WCI regional market. WCI is a collaboration among states and provinces that was initiated in 2007 to address climate change at a regional level. Within WCI, the three jurisdictions collaborated on the development of cap-and-trade program-design recommendations, providing a roadmap for program implementation and harmonization. California's Cap-and-Trade Regulation was developed concurrently with the WCI design documents that provide a template for a regional cap-and-trade program. The similar design features and minimum stringency requirements drawn from the WCI process facilitate linkage among the California, Québec, and Ontario, Canada programs.

SB 1018 (Gov. Code, §§ 12894(f) and (g)) requires that the Governor make four findings prior to linking the California Program with other jurisdictions. Under SB 1018, the Governor must find:

- 1. The jurisdiction with which the state agency proposes to link has adopted program requirements for greenhouse gas reductions, including but not limited to, requirements for offsets, that are equivalent to or stricter than those required by the California Global Warming Solutions Act of 2006 (Division 25.5 of the Health and Safety Code §38500-38599).
- 2. Under the proposed linkage, the State of California is able to enforce California Global Warming Solutions Act of 2006 (Division 25.5 of the Health and Safety Code §38500-38599) and related statues, against any entity subject to regulation under those statutes, and against any entity located within the linking jurisdiction to the maximum extent permitted under the United States' and California's Constitutions.
- 3. The proposed linkage provides for enforcement of applicable laws by the state agency or by the linking jurisdiction of program requirements that are equivalent to or stricter than those required by California Global Warming Solutions Act of 2006 (Division 25.5 of the Health and Safety Code §38500-38599).
- 4. The proposed linkage and any related participation of the State of California in Western Climate Initiative, Incorporated, shall not impose any significant liability on the state or any state agency for any failure associated with the linkage

Linkage with Ontario, Canada would allow for acceptance of offset credits both from allowances and offset projects. Additional details on the development of proposed regulatory amendments for linkage with Ontario, Canada may be found in the Staff Report for Proposed 2016 Cap-and-Trade Amendments.

b) Reasonably Foreseeable Compliance Responses

The Proposed Project does not authorize implementation of Ontario's Cap-and-Trade Program. ARB lacks jurisdiction to implement any part of Ontario's Cap-and-Trade Program beyond the linkage included as part of the Proposed Project. Therefore, covered entity compliance obligations under Ontario's Cap-and-Trade Program exist independently of the Proposed Project. Any environmental effects resulting from covered entity compliance obligations under Ontario's Cap-and-Trade Program are therefore not attributable to the Proposed Project. However, for purposes of disclosure, ARB provides information in this EA regarding what is currently known about potential environmental impacts that may result from implementation of Ontario's Cap-and-Trade Program. Because Ontario, Canada and California are members of WCI, and have collaborated on the development of cap-and-trade program designs, it is assumed that the types of activities that would be implemented by covered entities in Ontario, Canada would be similar to those anticipated for California. An overview of covered entities and the reasonably foreseeable compliance responses are described above under Section 2.B.

With regard to potential compliance responses resulting from development of Canadian offset projects, currently Ontario, Canada is considering three offset protocols that would consist of mine methane, ODS, and landfill gas projects. Compliance responses associated with linkage to Ontario, Canada's Cap-and-Trade Regulation would be similar to those discussed above in Section 2.C.1 for ODS projects, Section 2.C.6 for MMC projects, and Section 2.C.7 for landfill gas projects.

4. Facilitate Compliance with the Federal Clean Power Plan

a) Summary of Proposed Amendments

Essentially all of the affected EGUs that are subject to CPP are already covered entities under the Cap-and-Trade Program, and all CPP affected EGUs will ultimately be covered by the Program. The Cap-and-Trade Regulation and the market it creates are designed to ensure California's progress toward the state's GHG targets, cover the electricity sector, and reflect the benefits of complementary energy sector policies including the Renewable Portfolio Standard (RPS), Emissions Performance Standards, energy efficiency standards for buildings and appliances, and the suite of measures adopted pursuant to AB 32. For these reasons, ARB is proposing a plan for compliance that utilizes the existing Cap-and-Trade Program as a compliance pathway via the "State Measures" approach in CPP, discussed above in Section 1.C. The compliance plan is designed to demonstrate that the entities complying with the Cap-and-Trade Regulation would also be in compliance with the Federal CPP by way of the existing carbon market and complementary energy sector policies, as well as federally enforceable emission standards for covered power plants and a federally enforceable "backstop" to ensure federally regulated power sector emissions meet the federal target.

The proposed Regulatory amendments necessary to implement this "State Measures" approach include: (1) provisions requiring all CPP affected EGUs to comply with the Cap-and-Trade Regulation so long as they are subject to CPP and the requirements of the Regulation; (2) alignment of compliance periods between CPP and the Cap-and-Trade Regulation, to ensure that affected EGUs comply with CPP deadlines; (3) backstop provisions, triggered if affected EGU emissions, on a statewide basis, exceed required federal targets in any compliance period by more than 10 percent. The backstop provision is very unlikely to be triggered. However, if the backstop provision is triggered, affected EGUs will be required to secure and retire additional compliance instruments from a limited pool of California CPP allowances of a size consistent with the federal target levels, thereby reducing their smokestack emissions to the level required by CPP within eighteen months of the reported exceedance. More information regarding ARB's plan for CPP compliance, including preliminary modeling analyses, can be found on ARB's Clean Power Plan
webpage: http://www.arb.ca.gov/cc/powerplants/powerplants.htm

b) Reasonably Foreseeable Compliance Responses

CPP applies only to certain existing electrical generating facilities. Therefore, compliance responses are not expected from entities that are not subject to CPP. Nearly all California entities subject to CPP are already covered entities under the Cap-and-Trade Program, and all CPP affected EGUs will ultimately be covered by the Program. For these entities, Staff does not anticipate compliance responses beyond those expected for continuation of the Cap-and-Trade Program post-2020. Staff expects the few entities subject to CPP that are not currently covered entities under the Cap-and-Trade Program, but which are included in the Program as a result of CPP and these amendments, to implement similar compliance responses to reduce their GHG emissions.

Staff anticipates California will achieve compliance with the mass-based goal set forth in CPP through implementation of its Cap-and-Trade Program, even under a stress-case scenario containing assumptions such as high economic and demographic growth, lower electricity rates, lower self-generation impacts, strong climate change impacts, and more electrification. Therefore, staff does not anticipate CPP to drive any additional compliance responses distinct from those caused by the Cap-and-Trade Program under foreseeable circumstances.

However, implementation of the backstop, though extremely unlikely, would cause additional compliance responses. In that circumstance, staff anticipates that affected EGUs would reduce emissions to a degree consistent with the federal limits, including via purchases of securing and surrendering additional compliance instruments from a limited backstop pool to restore emissions to federal limits and make up any overage.

In the event the backstop is triggered, reduced generation to comply with federal target levels is especially likely at older, less efficient and more highly-polluting existing EGUs covered by CPP. Additional power needs would be met by cleaner units. Because all

large California power plants are covered by the Cap-and-Trade Regulation, and California continues to increase renewable energy procurement, staff does not anticipate that additional fossil power would be generated from new EGUs under these circumstances. Instead, any necessary power would likely come from renewable sources.

5. Streamline Implementation of the Cap-and-Trade Regulation

a) Summary of Proposed Amendment

Proposed amendments to the Cap-and-Trade Regulation include streamlining implementation of the Compliance Offsets Program, auctions, and the management of information submitted pursuant to the Regulation.

Proposed amendments to the Cap-and-Trade Regulation requirements for the Compliance Offsets Program include modifications or clarifications to the timeline for offset credit issuance, clarifications regarding determining periods of regulatory noncompliance for the MMC and Livestock Protocols, and other changes related to the implementation of the Program.

Proposed amendments to the Cap-and-Trade Regulation requirements for auctions include opportunities for streamlining auctions by removing the requirement to submit notification of intent to bid and streamlining financial settlement by reducing the bid guarantee options to ensure cash payment upon certification of auction and allowing bid guarantees to be maintained.

The Cap-and-Trade Regulation currently requires information to be submitted to ARB including user registration, entity registration (Compliance Instrument Tracking System Service [CITSS] account application), publicly owned electrical distribution utilities or electrical cooperatives allowance allocation to compliance account or limited use holding account, reporting on use of electrical distribution utility allocated allowance value, and transfer request information.

Proposed approaches to streamlining the management of submitted information include allowing electronic reporting and signature of required information, including attestations. This includes the potential for developing mechanisms for the online submission of entity information not currently reported in CITSS to replace hardcopy forms and developing online submission for publicly owned electrical distribution utilities and electrical cooperatives designation of allowance allocation to Compliance Account or Limited Use Holding Account. The Regulation sections referencing the timing and content of disclosure updates for corporate associations would be consolidated, and timeframes for updating corporate association changes would be modified to increase consistency.

Additional details on the development of proposed regulatory amendments to streamline the Compliance Offsets Program, auctions, and management of information may be found in the Staff Report for Proposed Project.

b) Reasonably Foreseeable Compliance Responses

These proposed Regulation amendments are largely administrative in nature; therefore, they would not affect previously evaluated compliance responses for covered sectors. The proposed amendments pertaining to determining periods of regulatory noncompliance for projects developed under the MMC and Livestock Protocols would not alter the previously analyzed compliance responses. The proposed changes would more specifically delineate periods of regulatory noncompliance, while continuing to prohibit issuance of offset credits for time periods when an offset project is not in regulatory compliance as set forth in the Regulation.

6. Ensure Compliance Obligations are Accurately Assessed for Imported Electricity

a) Summary of Proposed Amendments

AB 32's statewide limit on greenhouse gas emissions includes "all emissions from the generation of electricity delivered to and consumed in California … whether the electricity is generated or imported". (Health & Safety Code § 38505(m)). Accordingly, ARB includes emissions resulting from power imported to serve California loads in the Cap-and-Trade Regulation.

Recent developments in the CAISO markets warrant a reevaluation of some provisions of the Regulation, which address power imported through those markets. Specifically, the CAISO energy imbalance market (EIM) is designed to allow for efficient dispatch of real-time power to address energy imbalances across the market's geographic area, which now includes several western balancing areas. CAISO designed the EIM in an effort to allow for cost-recovery for compliance obligations incurred on power imported to serve California loads. The primary mechanism for doing so is a "greenhouse gas bid adder", and participating resource scheduling coordinators may build this into their bid to recover compliance costs. Because these bids are taken into account in dispatch, the EIM algorithm (all else being equal) will "deem" power from entities with lower greenhouse gas bid adders to have served California.

However, this may not fully account for all emissions resulting from the generation of electricity delivered to and consumed in California. This is because the CAISO EIM model currently accounts for the cost associated with a California GHG compliance obligation for imported EIM energy by selecting the lowest cost out-of-State power plants willing to be deemed delivered to California to receive a Cap-and-Trade compliance obligation. Specifically, out-of-state power plants quote a megawatt-hour (MWh) quantity of energy for which they are willing to be assigned a compliance obligation, and a price per MWh at which they believe they can recoup the cost of this compliance obligation. Out-of-State megawatt-hours that are assigned a GHG award (to cover the cost of compliance with the Cap-and-Trade Program) within the EIM time interval are termed "deemed-delivered." "Deemed-delivery" in the terms of the algorithm is a distinct concept from whether or not the plant is producing energy in response to California load demand. Clean resources with a lower deemed-delivery bid price are selected for "deemed-delivery" to California, while higher-emitting power plants with a higher deemed-delivery bid may, in fact, be dispatching in response to changes in California load. This accounting system is inconsistent with the requirement in AB 32 that ARB account for the total GHG emissions in the State, including all GHG emissions from the electricity delivered to and consumed in California, because the EIM cost optimization model may not in all cases report the full GHG burden experienced by the atmosphere as a consequence of the electricity consumed in California.

ARB and CAISO continue to work to ensure imports through CAISO markets are fully accounted for. The proposed regulatory amendments represent an initial option that

was developed by CAISO. ARB and CAISO are coordinating with stakeholders to refine the proposed solution for the GHG accounting issue and are soliciting options for alternatives. The Proposed Project includes regulatory amendments designed to ensure these emissions are accounted for and assigned as a compliance obligation to those entities serving California load whose actions cause those emissions. As proposed, the amendments would include a mechanism to apportion compliance obligations for the additional emissions associated with re-dispatch to California entities, which are serving California load by purchases from the EIM, in addition to the compliance obligations currently imposed on EIM importers.

b) Reasonably Foreseeable Compliance Responses

The proposed amendments would likely generate compliance responses similar in nature to those already described in the 2010 FED for self-generation and for first delivers of electricity. Specifically, entities faced with additional compliance obligations as a result of the proposed amendments would likely seek to reduce these obligations by seeking to purchase from renewable sources or lower carbon sources where possible. This may create market incentives for operators of generation sources selling into the California market to reduce emissions by improving plant efficiency or developing more renewable power. However, the most likely compliance response is considered to be the purchase of allowances or offsets to meet surrender obligations.

3.0 ENVIRONMENTAL AND REGULATORY SETTING

The California Environmental Quality Act (CEQA) Guidelines (Cal. Code Regs., tit. 14, § 15000 et. seq.) require an environmental impact report (EIR) to include an environmental setting section that discusses the current environmental conditions in the vicinity of the project. This environmental setting normally constitutes the baseline physical conditions against which an impact is compared to determine whether or not it is significant (see Cal. Code Regs., tit.14, § 15125). As discussed above in Chapter 1 of this Draft Environmental Analysis (Draft EA), the California Air Resources Board (ARB or Board) has a certified regulatory program and prepares an environmental analysis (EA) in lieu of an EIR. This Draft EA is a functional equivalent to an EIR under CEQA therefore, in an effort to comply with the policy objectives of CEQA, an environmental setting, as well as a regulatory setting with relevant environmental laws and regulations, has been included as Attachment A to this document.

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4.0 IMPACT ANALYSIS AND MITIGATION MEASURES

This chapter contains an analysis of environmental impacts and mitigation measures that could result from the Proposed Cap-and-Trade Regulatory Amendments and California's Compliance Plan for the federal Clean Power Plan (Proposed Project). Section A provides an overview of the basis for conducting environmental impact analysis and determining the potential significance of impacts that could occur as a result of adoption and implementation of these regulations. Section B provides a programmatic environmental analysis of an illustrative, reasonably foreseeable compliance scenario that could result from implementation of the Proposed Project. A summary of environmental impacts and mitigation measures analyzed in this chapter is included in Attachment B.

A. Basis for Environmental Impact Analysis and Significance Determinations

The existing Cap-and-Trade Regulation, established in previous rulemakings, defines the declining cap on approximately 85 percent of total statewide GHG emissions. The California Environmental Quality Act (CEQA) states the baseline for determining the significance of environmental impacts will normally be the existing conditions at the time the environmental review is initiated (see Cal. Code Regs., tit.14, § 15125 (a)). Therefore, significance determinations reflected in this Draft Environmental Analysis (EA) are based on a comparison of the potential environmental consequences of the proposed regulations with the regulatory setting and physical conditions in 2016.

Compliance responses to the Cap-and-Trade Regulation are already in place and underway. As noted in Chapter 1 of this Draft EA, the Cap-and-Trade Regulation is an existing regulatory program that was adopted by the California Air Resources Board (ARB or Board) in 2011 and implemented in 2012. Several amendments have been made to update and add compliance offset protocols; add a linkage to Québec, Canada; and to make minor text modifications subsequent to the initial approval of the Regulation.

For the purpose of determining whether the Proposed Project would have a potential effect on the environment, ARB evaluated the potential physical changes to the environment resulting from reasonable foreseeable compliance scenarios for the Proposed Project. Approval and implementation of the Proposed Project would result in several amendments to the existing Regulation, as described in Chapter 2. The environmental effects of the Proposed Project would, therefore, build upon the compliance responses of the existing Regulation. In many instances, compliance responses associated with the Proposed Project would be a continuation of actions that are already occurring.

1. Adverse Environmental Impacts and Mitigation Measures

This Draft Environmental Analysis (EA) relies primarily on previously certified environmental documents, providing summaries of documents incorporated by reference. The analysis of adverse effects on the environment, and significance determinations for those effects, reflect the programmatic nature of the analysis of the reasonably foreseeable compliance responses of the regulated entities and the marketplace. These reasonably foreseeable compliance responses are described in more detail in Chapter 2. The Draft EA addresses broadly defined types of impacts or actions that may be taken by others in the future as a result of the Proposed Project, without the ability to determine specific projects or locations, facility size and character, or site-specific environmental characteristics affected by any potential future facilities. For purposes of this impact analysis section, the term "project" refers to any activities undertaken by entities and the marketplace in response to the Proposed Regulations; and the term "project-level" refers to the site-specific facility level activities that are reasonably foreseeable. These references to "project" should not be confused with the reference to the proposed amendments as a "project" for purposes of CEQA, as discussed in section 1.E.1 above.

This impact analysis 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 Project and environmentally sensitive resources or conditions that may be affected. This 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 EA, which are not already mitigated or avoided, can later be avoided or reduced to a less-than-significant level. If a potentially significant environmental effect cannot be feasibly mitigated with certainty, this Draft EA identifies it as significant and unavoidable. If the Board approves the Proposed Project, with one or more significant, unavoidable environmental effects identified in this Draft EA, as part of that approval action, the Board would adopt findings for each significant impact as well as a statement of overriding considerations (i.e., other benefits of the action including economic, legal, social, technological benefits that are determined to outweigh and override the Proposed Project's unavoidable significant effects).

2. Beneficial Effects to the Environment

Where applicable, consistent with ARB's certified regulatory program requirements (Cal. Code Regs., tit.17, § 60005 (b)) this Draft EA also acknowledges potential beneficial effects on the environment in each resource area that may result from implementation of the Proposed Project.

B. Impact Analysis and Mitigation Measures

The following discussion provides a programmatic analysis of the reasonably foreseeable compliance responses that could result from implementation of the Proposed Project, which are described in Chapter 2 of this Draft EA. The impact analysis is organized by environmental resource areas in accordance with the topics presented in the Environmental Checklist in Appendix G to the CEQA Guidelines (Cal. Code Regs., tit. 14, § 15000 et. seq.). The reasonably foreseeable compliance responses associated with the proposed regulations 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 (i.e., the proposed LCFS and ADF regulations); (2) the reasonably foreseeable compliance responses would result in generally similar environmental effects that can be mitigated in similar ways (Cal. Code Regs., tit.14, § 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 EA, the public agency with authority over the later activity would be required to conduct additional environmental review as required by CEQA or other applicable statute.

The analysis is separated into two sections. Under Section 4.C, impacts are addressed regarding extension of the cap post-2020, extension of allowance allocation beyond 2020 and incorporation of the results of leakage studies for post-2020 industrial allocation, and compliance with the Clean Power Plan (CPP). Staff expects these actions would result in similar reasonably foreseeable compliance responses as discussed in the 2010 FED (ARB 2010a); the Regulation to Reduce Methane Emissions from Municipal Solid Waste Landfills ISOR, Chapter VI (ARB 2009); the Compliance Offset Protocol Rice Cultivation Projects ISOR, Appendix B (ARB 2014a); Compliance Offset Protocol MMC Projects ISOR, Appendix A (ARB 2013b), Amendments to the California Cap on Greenhouse Gas emissions and Market-based Compliance Mechanisms to Allow for Use of Compliance Instruments Issued by Linked Jurisdictions (i.e., linkage to Québec) ISOR (ARB 2012), and the Compliance Offset Protocol U.S. Forest Offset Projects ISOR, Appendix C (ARB 2014b). These documents are incorporated by reference, as described in Section.1.H. Compliance responses that would occur under offset projects and covered entities in Ontario, Canada would be similar to those described in the 2010 FED (ARB 2010a), the MMC Protocol EA (ARB 2013b), and the Initial Statement of Reasons (ISOR) for ARB's Landfills Regulation (ARB, 2009). These documents are incorporated by reference, as described in Section.1.H. Summaries of the environmental analyses in these documents are provided in Section 4.D to address potential impacts from linkage to Ontario, Canada.

The impact analysis is based on reasonably foreseeable compliance responses. This approach provides a credible basis for the Draft EA conclusions consistent with available evidence. Because the specific location, extent, and design of potential new and/or modified facilities cannot be known at this time, the impact discussions reflect a

conservative assessment to describe the type and magnitude of effects that may occur (i.e., in that the conclusions tend to overstate potential adverse effects).

C. Impacts Associated with Extension of the Cap Post-2020, Extension of Allowance Allocation Beyond 2020, and Incorporation of Results of Leakage Studies for Post-2020 Industrial Allocation

This section summarizes the potential impacts that could result from implementation of covered entity compliance responses. The reasonably foreseeable covered entity compliance responses generally include (1) Upgrading Equipment, (2) Decarbonization (switching to fuels with lower carbon intensity), (3) Implementing Process Changes, and (4) Surrendering Compliance Instruments. Additionally, the Proposed Project would result in continued implementation of offset projects under offset protocols: Ozone Depleting Substances (ODS), Livestock, Urban Forest, MMC, Rice Cultivation, and U.S. Forests. As discussed above, the reasonably foreseeable compliance responses discussed in this section focus on those activities with the potential to result in either a direct or indirect physical change in the environment. These include construction activities, infrastructure and equipment installations, and substantial operational changes to facilities. While the purchase of compliance instruments is also a reasonably foreseeable compliance response, it would not result in direct physical effects on the environment, and therefore that compliance response is not discussed further in this section.

1. Aesthetics

The covered entity compliance responses consist of upgrading equipment, switching to lower intensity carbon fuels, and implementing maintenance and process changes at existing facilities. Implementation of these compliance responses could consist of modifications to existing equipment and/or installation of new equipment at existing facilities. It is possible that incidental new structures, such as ancillary outbuildings, covered shelters, or onsite utility lines may be necessary to accommodate some improvements. Improvements such as these would not substantially alter the visual environment because they would generally be similar in character to existing facilities associated with covered entities (e.g., industrial land uses). Thus, covered entity compliance responses would result in less-than-significant impacts.

Eligible offset credits must be generated through projects that are in conformance with all applicable environmental, health, and safety regulations. The Offset projects conducted under the ODS Offset Protocol would occur at existing destruction facilities; therefore, would not be expected to introduce activities that would disrupt aesthetic or visual settings. Implementation of the Livestock Offset Protocol would include construction and operation of digesters in agricultural settings. Digesters are consistent with agricultural uses (i.e., structural aspects of farms) and would not represent a significant adverse change to the visual character of the vicinity. The U.S. Forest Offset Protocol would not increase the amount of forest activities, but could result in activities

that increase carbon sequestration, such as less intensive harvesting and increased rotation lengths. This shift may change the visual character of offset project sites over time, but would not pose an adverse visual impact. Managing forests to increase cover and remove dead and diseased trees may be a visually beneficial effect. Implementation of the Urban Forest Offset Protocol would improve the quality of the urban visual environment and would be considered aesthetically beneficial (ARB 2010a). Implementation of the Rice Cultivation Protocol would alter flooding and draining patterns in rice fields, but would not substantially alter the visual character of rice farms (ARB 2014a). Implementation of the MMC Protocol may result in the installation of gas extraction, capture, transportation, processing, destruction, and monitoring equipment at existing active or abandoned mine sites. The installed equipment is likely to be of similar size, scale, and visual character to those typical of mining operations. However, abandoned mining sites and adjacent areas may have been subject to varying degrees of reclamation, reuse, and/or redevelopment since mine closure and abandonment. Construction of offset projects at abandoned mining sites could thus alter the visual character of such sites and adjacent surrounding areas, or introduce new sources of nighttime lighting that could adversely affect surrounding areas that may have been restored for active public recreation or uses other than mining. Under the MMC Protocol EA, compliance with relevant and applicable laws and regulations (e.g., Surface Mining Control and Reclamation Act [SMCRA]) would reduce the potential for conflicts with forest management, agricultural activities, or other existing land uses on affected reclaimed mining lands, and thus, aesthetic impacts were determined to be less-than-significant (ARB 2013b).

Impacts associated with extension of the cap post-2020, extension of allowance allocation beyond 2020, incorporation of results of leakage studies for post-2020 industrial allocation, and compliance with CPP would result in similar types of reasonably foreseeable compliance responses as discussed in the 2010 FED, U.S. Forest Offset Protocol Update EA, MMC Protocol EA, and Rice Cultivation Protocol EA. Thus, impacts to aesthetic resources associated with extension of the cap post-2020, extension of allowance allocation beyond 2020, incorporation of results of leakage studies for post-2020 industrial allocation, and compliance with CPP would be **less-than-significant**.

2. Agricultural and Forest Resources

The covered entity compliance responses consist of upgrading equipment, switching to lower intensity carbon fuels, and implementing maintenance and process changes at existing facilities, and as such would not be expected to impact agriculture or forest resources.

Eligible offset credits must be generated through projects that are in conformance with all applicable environmental, health, and safety regulations. The Implementation of the ODS Offset Protocol would not include activities that impact agriculture or forest resources. Implementation of the Livestock Offset Protocol would include the

construction of digesters in agricultural settings. Digesters are consistent with agricultural uses and would not represent an adverse change to agriculture or forest resources. Implementation of the Urban Forest Offset Protocol would not impact agriculture or forest resources. Implementation of the U.S. Forest Offset Protocol would not increase the amount of forest activities, but could shift activities to projects that increase carbon sequestration (i.e., reforestation, avoided deforestation). Managing forests to increase cover and remove dead and diseased trees may be considered a beneficial impact to forests. The U.S. Forest Offset Protocol does not incentivize actions that would encourage the conversion of agricultural land or forest lands (ARB 2010a). Implementation of the Rice Protocol would not incentivize new rice fields on lands not currently in production, and would not adversely affect agricultural and forest resources (ARB 2014a). Generally, projects associated with the MMC Protocol would be located in areas designated for mining; however, offset projects located at active or abandoned mines could be within or adjacent to forested areas. As described in the MMC Protocol EA, compliance with permitting requirements pursuant to SMCRA would avoid conflicts with reforestation activities or restoration of agricultural activities under any approved mine reclamation plans (ARB 2013b).

Impacts associated with extension of the cap post-2020, extension of allowance allocation beyond 2020, incorporation of results of leakage studies for post-2020 industrial allocation, and compliance with CPP would result in similar reasonably foreseeable compliance responses as discussed in the 2010 FED, U.S. Forest Offset Protocol Update EA, MMC Protocol EA, and Rice Cultivation Protocol EA. Thus, impacts to agricultural and forest resources associated with extension of the cap post-2020, extension of allowance allocation beyond 2020, incorporation of results of leakage studies for post-2020 industrial allocation, and compliance with CPP would be **less-than-significant**.

3. Air Quality

The proposed cap-and-trade program is designed to reduce greenhouse gas (GHG) emissions. However measures that reduce GHG emissions are expected to provide co-benefits in terms of reductions of criteria air pollutant and toxic air contaminants. Statewide, GHG, criteria pollutants, and toxic emissions are expected to be reduced as a result of the cap-and-trade program. This is a beneficial effect.

The covered entity compliance responses consist of upgrading equipment, switching to lower intensity carbon fuels, and implementing maintenance and process changes at existing facilities. Construction, grading, and trenching have the potential to adversely impact air quality related to dust emissions and equipment emissions. Recognized measures exist to reduce this potentially significant impact, but the authority to determine project-level impacts and require project-level mitigation lies with the permitting agency for individual projects. Further, the programmatic analysis does not allow project-specific details of mitigation, resulting in an inherent uncertainty in the degree of mitigation ultimately implemented to reduce the potentially significant impacts.

Consequently, the 2010 FED took the conservative approach in its post-mitigation significance conclusion and disclosed, for CEQA compliance purposes, that this potentially significant impact may be unavoidable (ARB 2010a).

The 2010 FED considered the possibility that some covered entities might increase operation of specific equipment, which could increase local emissions. Compliance obligations under the Cap-and-Trade program have only been effective since January 1, 2013. Because ARB has received so few years of reported data to date, ARB lacks sufficient information to conclude with certainty that localized emissions increases have not occurred. While ARB continues to believe that resulting localized air impacts are extremely unlikely, the potential for localized increases cannot be entirely dismissed. ARB has developed an adaptive management approach to minimize this potential impact. ARB approved the Adaptive Management Plan approach in 2011 (ARB 2011b). The key elements of this Adaptive Management Plan are: (1) data and data source identification (information gathering); (2) analysis to determine whether an adverse impact is caused by the cap-and-trade regulation (review and analysis); and (3) identifying potential actions ARB could take to address these impacts and committing to take appropriate action (response). Through a public process, ARB Staff is continuing to work with stakeholders to refine the Adaptive Management process and plans to update the Board on these efforts by the end of 2016. See http://www.arb.ca.gov/cc/capandtrade/adaptivemanagement/adaptivemanagement.htm for more information.

Because the authority to determine project-level impacts and require project-level mitigation lies with the permitting agency for individual projects, and the programmatic analysis does not allow project-specific details of mitigation, there is inherent uncertainty in the degree of mitigation ultimately implemented to reduce the potentially significant impacts. Consequently, the 2010 FED took the conservative approach in its post-mitigation significance conclusion and disclosed, for CEQA compliance purposes, that this potentially significant impact may be unavoidable (ARB 2010a).

Eligible offset credits must be generated through projects that are in conformance with all applicable environmental, health, and safety regulations. Implementation of the ODS Offset Protocol and the Livestock Offset Protocol would produce incidental emissions from transportation and construction which would be less-than-significant, however, implementation of Livestock Protocol projects could result in potentially significant and unavoidable odor-related impacts. Construction and operational activities associated with MMC offset projects could cause an increase in criteria pollutant or toxic air contaminant emissions, however projects associated with offset protocols would need to be implemented in accordance with all applicable federal, state, and local regulation and regulatory oversight requirements (see Attachment A) in order to be issued credits for emission reductions (ARB 2010a, ARB 2013b). Consequently, the potential impacts to air quality from the implementation of MMC offset projects would be less-than-significant. Changes in cultivation practices under the Rice Protocol would not result in changes to equipment that could substantially affect air pollutant emissions (ARB

2014a). Projects implemented under the Urban Forest Offset Protocol would produce minimal emissions from landscaping and maintenance activities that would be less-than-significant. The U.S. Forest Offset Protocol would not alter the level of forest activities and therefore would have a less-than-significant air quality impact (ARB 2010a).

Impacts associated with extension of the cap post-2020, extension of allowance allocation beyond 2020, incorporation of results of leakage studies for post-2020 industrial allocation, and compliance with CPP would result in similar reasonably foreseeable compliance responses as discussed in the 2010 FED, U.S. Forest Offset Protocol Update EA, MMC Protocol EA, and Rice Cultivation Protocol EA. Thus, impacts to air quality associated with extension of the cap post-2020, extension of allowance allocation beyond 2020, incorporation of results of leakage studies for post-2020 industrial allocation, and compliance with CPP would be **potentially significant and unavoidable**, related to odor-related impacts associated with Livestock Protocol projects and construction-related activities and operations that may be reasonably foreseeable compliance responses for covered entities. Impacts related to implementation of the other offset protocols would be **less-than-significant.**

4. Biological Resources

The covered entity compliance responses consist of upgrading equipment, switching to lower intensity carbon fuels, and implementing maintenance and process changes at existing facilities. Construction, grading and trenching have the potential to adversely impact any protected biological resources that might exist at those locations. Recognized measures exist to reduce this potentially significant impact, but the authority to determine project-level impacts and require project-level mitigation lies with the permitting agency for individual projects. Further, the programmatic analysis does not allow project-specific details of mitigation, resulting in an inherent uncertainty in the degree of mitigation ultimately implemented to reduce the potentially significant impacts. Consequently, the 2010 FED took the conservative approach in its post-mitigation significance conclusion and disclosed, for CEQA compliance purposes, that this potentially significant impact may be unavoidable (ARB 2010a).

Eligible offset credits must be generated through projects that are in conformance with all applicable environmental, health, and safety regulations. Implementation of the ODS Offset Protocol would not include activities that potentially impact biological resources. Implementation of the Livestock Offset Protocol would include the construction of digesters at or adjacent to existing livestock operations where natural habitats are expected to be absent or limited. As such, staff expects the Livestock Offset Protocol would result in less-than-significant impacts to biological resources. The Urban Forest Offset Protocol recognizes tree improvement projects in urban settings; therefore, would not be expected to significantly affect biological resources (ARB 2010a). The MMC Protocol EA (2013 EA) identified potential significant impacts to biological resources because the installation of gas extraction, capture, transportation, processing,

destruction, and monitoring equipment could cause direct and indirect impacts to special status species and habitats. These impacts could result from project-related activities such as construction of new equipment, interruption of water aquifers, and removal of water from abandoned mines. Recognized measures were identified as mitigation (e.g., preparation of a biological inventory). However, because the authority to determine project-level impacts and require project-level mitigation lies with the permitting agency for individual projects, and the programmatic analysis did not allow project-specific mitigation, there was inherent uncertainty in the degree of mitigation ultimately implemented to reduce the potentially significant impacts identified in the 2013 EA. Consequently, the 2013 EA took the conservative approach in its post-mitigation significance conclusion and disclosed, for CEQA compliance purposes, that the potentially significant impacts to biological resources may be unavoidable (ARB 2013b). Under the Rice Cultivation Protocol, because variability in the timing and availability of flooded rice habitat is common and voluntary compliance responses would occur on a limited rather than widespread basis, staff does not expect that implementation of changes in cultivation practices would cause significant effects on bird species, and effects on other special status species (e.g., giant garter snake) would be less-than-significant (ARB 2014a).

Implementation of the U.S. Forest Offset Protocol would not increase total forest activities, but could shift activities to projects that increase carbon sequestration. The 2010 FED determined that reforestation projects conducted under the U.S. Forest Offset Protocol have the potential to change existing habitat and disrupt wildlife. ARB's approach was to implement adaptive management to monitor and, where feasible, reduce this impact. Because the authority to determine project-level impacts and require project-level mitigation lies with the permitting agency for individual projects and the programmatic analysis does not allow project-specific details of mitigation, resulting in an inherent uncertainty in the degree of mitigation ultimately implemented to reduce the potentially significant impacts, the 2010 FED took the conservative approach in its post-mitigation significance conclusion and disclosed, for CEQA compliance purposes, that this potentially significant impact may be unavoidable (ARB 2010a). However, since 2010 staff has reevaluated the potential for adverse habitat changes and disruption to wildlife, and staff no longer anticipates that projects conducted under the U.S. Forest Offset Protocol would have the potential to cause significant impacts by changing existing habitat and disrupting wildlife and therefore would have a less-than-significant impact on biological resources.

Impacts associated with extension of the cap post-2020, extension of allowance allocation beyond 2020, incorporation of results of leakage studies for post-2020 industrial allocation, and compliance with CPP would result in similar reasonably foreseeable compliance responses as discussed in the 2010 FED, U.S. Forest Offset Protocol Update EA, MMC Protocol EA, and Rice Cultivation Protocol EA. Thus, impacts to biological resources associated with extension of the cap post-2020, extension of allowance allocation beyond 2020, incorporation of results of leakage studies for post-2020 industrial allocation, and compliance with CPP would be

potentially significant and unavoidable related to implementation of MMC offset projects and construction-related activities that may be reasonably foreseeable compliance responses for covered entities. Impacts related to implementation of U.S. Forest Protocol, ODS, Livestock, Urban Forest, and Rice Cultivation offset projects would be **less-than-significant**

5. Cultural Resources

The covered entity compliance responses consist of upgrading equipment, switching to lower intensity carbon fuels, and implementing maintenance and process changes at existing facilities. Compliance response activities are likely to occur within existing industrial areas. However, some earthmoving activities may occur on previously undisturbed land. Construction, grading and trenching have the potential to adversely impact any cultural resources that might exist at those locations. Recognized measures exist to reduce this potentially significant impact, but the authority to determine project-level impacts and require project-level mitigation lies with the permitting agency for individual projects. Further, the programmatic analysis does not allow project-specific details of mitigation, resulting in an inherent uncertainty in the degree of mitigation ultimately implemented to reduce the potentially significant impacts. Consequently, the 2010 FED took the conservative approach in its post-mitigation significance conclusion and disclosed, for CEQA compliance purposes, that this potentially significant impact may be unavoidable (ARB 2010a).

Eligible offset credits must be generated through projects that are in conformance with all applicable environmental, health, and safety regulations. Implementation of the ODS Offset Protocol would not include activities that potentially impact cultural resources (ARB 2010a). Implementation of the Rice Cultivation Protocol would result in similar levels of ground disturbance as under existing rice cultivation practices, thus impacts to cultural resources would be less-than-significant (ARB 2014a). Implementation of the U.S. Forest Offset Protocol could change the type of forest projects that are undertaken, but would not alter the overall level of forest activities, and as such would not increase potential impacts to cultural resources. Therefore, impacts would be less-than-significant (ARB 2010a). Implementation of offset projects under the Livestock Offset Protocol, Urban Forest Offset Protocol and MMC Protocol may be implemented in areas where cultural and historic resources could exist (e.g., archeological resources, historic resources, paleontological resources, and undocumented human remains). Although recognized mitigation measures exist to reduce these potential impacts, the authority to require project-specific mitigation lies with local permitting agencies and not ARB. Consequently, these impacts are conservatively identified as significant and unavoidable (ARB 2010a, ARB 2013b).

Impacts associated with extension of the cap post-2020, extension of allowance allocation beyond 2020, incorporation of results of leakage studies for post-2020 industrial allocation, and compliance with CPP would result in similar reasonably foreseeable compliance responses as discussed in the 2010 FED, U.S. Forest Offset

Protocol Update EA, MMC Protocol EA, and Rice Cultivation Protocol EA. Thus, impacts to cultural resources associated with extension of the cap post-2020, extension of allowance allocation beyond 2020, incorporation of results of leakage studies for post-2020 industrial allocation, and compliance with CPP would be **potentially significant and unavoidable** related to ground disturbances associated with actions related to the reasonably foreseeable compliance responses under covered entities and implementation of Livestock, Urban Forest, and MMC Protocol projects. Impacts related to ODS, Rice Cultivation and U.S. Forest Protocol projects would be **less-than-significant.**

6. Energy Demand

The covered entity compliance responses consist of upgrading equipment, switching to lower intensity carbon fuels, and implementing maintenance and process changes. These actions will reduce overall energy demand and are considered beneficial effects (ARB 2010a).

Eligible offset credits must be generated through projects that are in conformance with all applicable environmental, health, and safety regulations. Implementation of ODS projects would not require new or expanded electricity or natural gas facilities, or otherwise result in substantial increased demand for electricity. Construction projects associated with installation of digesters facilities, under livestock offset projects could require some additional energy demand, however, collected methane could be used to power on-site stationary combustion devices thereby reducing reliance on fossil fuels. Implementation of projects under the Urban Forest Offset Protocol and the U.S. Forest Offset Protocol would not substantial increase energy demand (ARB 2010a). Projects associated with the Rice Cultivation Offset Protocol would not require changes to equipment or otherwise affect energy demand (ARB 2014a). Under the MMC Protocol, increasing the supplies of electricity and natural gas could provide beneficial impacts (ARB 2013b).

Impacts associated with extension of the cap post-2020, extension of allowance allocation beyond 2020, incorporation of results of leakage studies for post-2020 industrial allocation, and compliance with CPP would result in similar reasonably foreseeable compliance responses as discussed in the 2010 FED, U.S. Forest Offset Protocol Update EA, MMC Protocol EA, and Rice Cultivation Protocol EA. Thus, impacts to energy demand associated with extension of the cap post-2020, extension of allowance allocation beyond 2020, incorporation of results of leakage studies for post-2020 industrial allocation, and compliance with CPP would be **beneficial.**

7. Geology, Soils, and Mineral Resources

The covered entity compliance responses consist of upgrading equipment, switching to lower intensity carbon fuels, and implementing maintenance and process changes at existing facilities. Construction, grading and trenching have the potential to result in

adverse soil erosion, dust generation, and sedimentation of local waterways. Recognized measures exist to reduce this potentially significant impact, but the authority to determine project-level impacts and require project-level mitigation lies with the permitting agency for individual projects. Further, the programmatic analysis does not allow project-specific details of mitigation, resulting in an inherent uncertainty in the degree of mitigation ultimately implemented to reduce the potentially significant impacts. Consequently, the 2010 FED took the conservative approach in its post-mitigation significance conclusion and disclosed, for CEQA compliance purposes, that this potentially significant impact may be unavoidable (ARB 2010a).

Eligible offset credits must be generated through projects that are in conformance with all applicable environmental, health, and safety regulations. Implementation of the ODS Offset Protocol would pose no significant impacts on geology, soils and mineral resources. Implementation of the Livestock Offset Protocol would include the construction of digesters that would be subject to regulations considered sufficient to mitigate potential impact to geology, soils and mineral resources to a less-than-significant level (ARB 2010a). Implementation of the MMC Protocol could require the drilling of new methane drainage wells and boreholes, trenching for gathering pipelines, and other activities involving new ground disturbance and excavation. Some minor soil erosion impacts may result from the installation of new equipment; however, Offset Project Operators would be required to implement MMC projects in accordance with all federal, state and local regulations to control erosion, drainage, and grading pursuant to SMCRA, the Clean Water Act, the Soil and Water Resources Conservation Act and other similar laws, which are considered sufficient to mitigate potential impact to geology, soils and mineral resources to a less-than-significant level (ARB 2013b). Implementation of the Rice Cultivation Protocol generally addresses changes to timing of activities that already occur and would not substantially affect geology and soils resources or affect the availability of mineral resources (ARB 2014a). Implementation of the Urban Forest Offset Protocol would result in only minor soil disturbance and would not be expected to adversely impact geology, soils or mineral resources (ARB 2010a), this impact would be less-than-significant. The U.S. Forest Offset Protocol would not increase total forest activities, but could shift activities to projects that increase carbon sequestration. Because the overall level of forest activities would not change, this impact would be less-than-significant (ARB 2010a).

Impacts associated with extension of the cap post-2020, extension of allowance allocation beyond 2020, incorporation of results of leakage studies for post-2020 industrial allocation, and compliance with CPP would result in similar reasonably foreseeable compliance responses as discussed in the 2010 FED, U.S. Forest Offset Protocol Update EA, MMC Protocol EA, and Rice Cultivation Protocol EA. Thus, impacts to geology, soils, and mineral resources associated with extension of the cap post-2020, extension of allowance allocation beyond 2020, incorporation of results of leakage studies for post-2020 industrial allocation, and compliance with CPP would be **potentially significant and unavoidable** related to construction-related activities that

may be reasonably foreseeable compliance responses for covered entities. Impacts related to the offset protocol projects would be **less-than-significant**.

8. Greenhouse Gases

As described in greater detail in the 2010 FED, covered entity compliance responses to the Proposed Project consist of upgrading equipment, switching to lower intensity carbon fuels, and implementing maintenance and process changes at existing facilities to reduce GHG emissions. Eligible offset credits must be generated through projects that are in conformance with all applicable environmental, health, and safety regulations.

Upgrading, retrofitting, and/or replacement of aging equipment at existing facilities to achieve long-term GHG emission reductions would result in a long-term beneficial effect. Construction activities, possibly including the operation of heavy equipment, could emit GHG during installation of equipment upgrades and/or incidental construction. These emissions would be short-term and considered less than significant.

Switching to a less carbon intensive energy source would reduce GHG emissions and represents a beneficial effect, and a beneficial effect. Construction activities for the installation of fuel tanks, storage structures, and lines could produce GHG emissions. These emissions would be short-term and considered less than significant.

Implementing process changes that reduce GHG emissions may similarly result in short-term GHG emissions due to temporary operation of equipment needed to effectuate the process changes, but this activity also represents a long-term beneficial effect due to GHG reductions resulting from the less GHG-intensive processes.

As with the existing Regulation, the levels of the post-2020 caps are critical to the environmental effectiveness of the Cap-and-Trade Program. Therefore, staff set the post-2020 caps to be sufficiently stringent to continue to spur GHG emission reductions to achieve AB 32 goals and the interim 2030 GHG reduction target. Staff set the cap for 2030 at 200.5 MMTCO2e. Additional details regarding the development of post-2020 caps may be found in the Staff Report for Proposed 2016 Cap-and-Trade Amendments.

Even taking into account the short-term GHG emission increases associated with incidental construction activities and installation of equipment upgrades, the Proposed Project is designed to substantially reduce statewide GHG emissions. The Proposed Project would provide greater GHG emission reductions than would otherwise occur in absence of the Proposed Project. Thus, reduction in GHG emissions from the Proposed Project is considered a **beneficial** impact.

9. Hazards and Hazardous Materials

The covered entity compliance responses consist of upgrading equipment, switching to lower intensity carbon fuels, and implementing maintenance and process changes at

existing facilities. The use of hazardous materials is common practice in industrial settings. Implementation of compliance responses could include the use of hazardous materials, but this would be considered simply an extension of business as usual for most covered entities, mitigated by existing practices and regulations, and thus considered less-than-significant (ARB 2010a).

Eligible offset credits must be generated through projects that are in conformance with all applicable environmental, health, and safety regulations. Offset projects implemented under the proposed offset protocols may result in the use or transport of hazardous materials that require special handling and disposal. All projects would be required to comply with established local, state, and federal laws pertaining to the use, storage, and transportation of these materials. Assuming compliance with applicable laws and regulations, the impacts would be less-than-significant (ARB 2010a, ARB 2013b, ARB 2014a).

Impacts associated with extension of the cap post-2020, extension of allowance allocation beyond 2020, incorporation of results of leakage studies for post-2020 industrial allocation, and compliance with CPP would result in similar reasonably foreseeable compliance responses as discussed in the 2010 FED, U.S. Forest Offset Protocol Update EA, MMC Protocol EA, and Rice Cultivation Protocol EA. Thus, impacts related to hazards and hazardous materials, associated with extension of the cap post-2020, extension of allowance allocation beyond 2020, incorporation of results of leakage studies for post-2020 industrial allocation, and compliance with CPP would be **less-than-significant**.

10. Hydrology and Water Quality

The covered entity compliance responses consist of upgrading equipment, switching to lower intensity carbon fuels, and implementing maintenance and process changes at existing facilities. Construction, grading and trenching have the potential to result in adverse soil erosion resulting in sedimentation and degradation of local waterways. Recognized measures exist to reduce this potentially significant impact, but the authority to determine project-level impacts and require project-level mitigation lies with the permitting agency for individual projects. Further, the programmatic analysis does not allow project-specific details of mitigation, resulting in an inherent uncertainty in the degree of mitigation ultimately implemented to reduce the potentially significant impacts. Consequently, the 2010 FED took the conservative approach in its post-mitigation significance conclusion and disclosed, for CEQA compliance purposes, that this potentially significant impact may be unavoidable (ARB 2010a).

Eligible offset credits must be generated through projects that are in conformance with all applicable environmental, health, and safety regulations. Implementation of the ODS Offset Protocol would have no adverse impacts on hydrology and water quality (ARB 2010a). Implementation of the Livestock Offset Protocol would include the construction of digesters that would be subject to regulations which are considered sufficient to

reduce potential impacts to hydrology and water quality to a less-than-significant level (ARB 2010a). Implementation of the MMC Protocol may include drilling of new methane drainage wells and boreholes. Drilling and well development can result in the removal of significant amounts of groundwater resulting from drawdown of water in the coalbed. The groundwater extracted during drilling, known as produced water. Produced water must be treated and disposed of properly or risk contamination of soils or surface waters. In addition operation of a methane drainage well would continue to create produced water. All projects implemented under the MMC Protocol must be in accordance with all applicable federal, state, and local regulations and regulatory oversight requirements in order to be issued credits for emission reductions. Consequently, the potential impacts to hydrology and water quality would likely not be adverse, and where an adverse impact may occur, would be less than significant due to the required compliance with laws and regulations (ARB 2013b). Implementation of the Rice Cultivation Protocol would change irrigation and drainage timing, but not result in significant impacts on hydrology and water quality because practices would remain generally the same as the existing conditions within an individual site (ARB 2014a). Implementation of the Urban Forest Offset Protocol would result in only minor soil disturbance resulting in less-than-significant impacts to hydrology or water quality. Implementation of the U.S. Forest Offset Protocol would not increase total forest activities, but could shift activities to projects that increase carbon sequestration. Because the overall level of forest activities would not change, the potential to adversely impact hydrology and water quality would not change this impact would be less-than-significant (ARB 2010a).

Impacts associated with extension of the cap post-2020, extension of allowance allocation beyond 2020, incorporation of results of leakage studies for post-2020 industrial allocation, and compliance with CPP would result in similar reasonably foreseeable compliance responses as discussed in the 2010 FED, U.S. Forest Offset Protocol Update EA, MMC Protocol EA, and Rice Cultivation Protocol EA. Thus, impacts to hydrology and water quality associated with extension of the cap post-2020, extension of allowance allocation beyond 2020, incorporation of results of leakage studies for post-2020 industrial allocation, and compliance with CPP would be **potentially significant and unavoidable** related to construction-related activities that may be reasonably foreseeable compliance responses for covered entities. Impacts related to offset protocol projects would be **less-than-significant.**

11. Land Use and Planning

The covered entity compliance responses consist of upgrading equipment, switching to lower intensity carbon fuels, and implementing maintenance and process changes at existing facilities, and as such would be consistent with the existing land use and would pose a less-than-significant land use and planning impact.

Eligible offset credits must be generated through projects that are in conformance with all applicable environmental, health, and safety regulations. Implementation of the ODS Offset Protocol would involve the use of existing facilities, representing a less-than-

significant impact to land use and planning. Implementation of the Livestock Offset Protocol would allow the construction of digesters in agricultural settings. Digesters are an allowed use in agricultural areas; therefore, their construction would not conflict with existing land use plans, and would be a less-than-significant impact. Projects implemented under the Urban Forest Offset Protocol, and Rice Cultivation Protocol would not conflict with land use plans, resulting in a less-than-significant impact (ARB 2010aARB 2014a). Implementation of the MMC Protocol could result in the installation of mine methane gas extraction, capture, transportation, treatment, destruction, and monitoring equipment would be situated at either active or abandoned mines throughout the United States. Mine methane management can be considered an integral part of mine operations and therefore would not result in land use conflicts at active mines. In some circumstances, MMC offset projects located at abandoned mines could be located within or adjacent to areas where reclamation has occurred subsequent to a mine's closure and abandonment. Mine reclamation activities such as re-vegetation, reforestation, and geomorphological restoration on abandoned mine lands can also eventually lead to restored public use. Any MMC compliance response activities at abandoned mining sites would be required to comply with federal, state and local permitting requirements under SMCRA or applicable land use and zoning regulations that are in effect subsequent to completion of reclamation activities, in order to avoid potential land use conflicts on abandoned mining lands. Thus, impacts related to land use and planning would, therefore, be considered less than significant.

The U.S. Forest Offset Protocol includes avoided conversion projects that could conflict with local land use plans that envision development or other uses of forested areas. The authority to determine project-level impacts and require project-level mitigation lies with the permitting agency for individual projects. Further, the programmatic analysis does not allow project-specific details of mitigation, resulting in an inherent uncertainty in the degree of mitigation ultimately implemented to reduce the potentially significant impacts. Consequently, the 2010 FED took the conservative approach in its post-mitigation significance conclusion and disclosed, for CEQA compliance purposes, that the potentially significant impacts described as possible conflicts between the "avoided conversion" element of the U.S. Forest Offset Protocol and land use plans may be unavoidable (ARB 2010a).

Impacts associated with extension of the cap post-2020, extension of allowance allocation beyond 2020, incorporation of results of leakage studies for post-2020 industrial allocation, and compliance with CPP would result in similar reasonably foreseeable compliance responses as discussed in the 2010 FED, U.S. Forest Offset Protocol Update EA, MMC Protocol EA, and Rice Cultivation Protocol EA. Thus, impacts to land use and planning associated with extension of the cap post-2020, extension of allowance allocation beyond 2020, incorporation of results of leakage studies for post-2020 industrial allocation, and compliance with CPP would be **potentially significant and unavoidable** related to implementation of U.S. Forest Offset projects. Impacts related to covered entities actions and ODS, Livestock, Urban

Forest, Rice Cultivation, and MMC offset protocol projects would be **less-than-significant.**

12. Noise

The covered entity compliance responses consist of upgrading equipment, switching to lower intensity carbon fuels, and implementing maintenance and process changes. Construction has the potential to introduce short-term noise levels that would exceed acceptable ambient levels. Because of the short-term nature of construction, and the industrial setting in which these noises would occur, this impact would be less-than-significant. Recognized measures exist that are implemented as standard practice to minimize construction noise (ARB 2010a).

Eligible offset credits must be generated through projects that are in conformance with all applicable environmental, health, and safety regulations. Implementation of the ODS Offset Protocol and Rice Cultivation Protocol would not result in significant adverse noise impacts and are identified as less-than-significant (ARB 2010a, ARB 2014a). Projects implemented under the Urban Forest Offset Protocol would not produce unacceptable noise levels and is considered a less-than-significant impact. Projects implemented under the U.S. Forest Offset Protocol would occur in forested areas. U.S. Forest projects may produce elevated noise levels that exceed accepted ambient levels. However, adoption of the U.S. Forest Offset Protocol would not alter the extent of forest activities, but would simply shift some activities to projects that sequester carbon. Because the level of overall forest activities would not change, the consequential noise impacts would not change. Thus, this impact is considered less-than-significant (ARB 2010a). Implementation of the MMC Protocol would involve the installation of methane capture and destruction equipment and some projects may involve the installation of gas processing equipment and/or gathering lines and operation of new stationary noise sources (e.g., compressors, flares, oxidizers); however, staff does not expect that MMC projects would be within close enough proximity of a noise-sensitive receptor to be deemed a significant impact (ARB 2013b). Implementation of the Livestock Offset Protocol would allow the construction of digesters in agricultural settings. Construction of digesters could adversely impact sensitive receptors and is considered a significant and unavoidable impact. Recognized measures exist to reduce this potential impact, but the authority to require project-specific mitigation lies with local permitting agencies and not ARB. Consequently, this impact is identified as significant and unavoidable.

Impacts associated with extension of the cap post-2020, extension of allowance allocation beyond 2020, incorporation of results of leakage studies for post-2020 industrial allocation, and compliance with CPP would result in similar reasonably foreseeable compliance responses as discussed in the 2010 FED, U.S. Forest Offset Protocol Update EA, MMC Protocol EA, and Rice Cultivation Protocol EA. Thus, impacts to noise associated with extension of the cap post-2020, extension of allowance allocation beyond 2020, incorporation of results of leakage studies for post-2020 industrial allocation, and compliance with CPP would be **potentially significant and**

unavoidable related to implementation of Livestock Offset projects. Impacts related to actions taken by covered entities and the ODS, Urban Forest, U.S. Forest, Rice Cultivation, and MMC offset protocol projects would be **less-than-significant.**

13. Population, Employment, and Housing

The cap-and-trade program, including the proposed compliance offset protocols and associated offset projects would not result in significant adverse impacts to employment, population, or housing. Eligible offset credits must be generated through projects that are in conformance with all applicable environmental, health, and safety regulations. All impacts to population, employment, and housing would be less-than-significant (ARB 2010a, ARB 2013b, ARB 2014a).

Impacts associated with extension of the cap post-2020, extension of allowance allocation beyond 2020, incorporation of results of leakage studies for post-2020 industrial allocation, and compliance with CPP would result in similar reasonably foreseeable compliance responses as discussed in the 2010 FED, U.S. Forest Offset Protocol Update EA, MMC Protocol EA, and Rice Cultivation Protocol EA. Thus, impacts to population, employment, and housing associated with extension of the cap post-2020, extension of allowance allocation beyond 2020, incorporation of results of leakage studies for post-2020 industrial allocation, and compliance with CPP would be **less-than-significant**.

14. Public Services

The covered entity compliance responses consist of upgrading equipment, switching to lower intensity carbon fuels, and implementing maintenance and process changes. These projects would not increase the level of public services beyond that already provided to existing facilities, and impacts would be less-than-significant (ARB 2010a).

Eligible offset credits must be generated through projects that are in conformance with all applicable environmental, health, and safety regulations. Implementation of the ODS Offset Protocol, the Livestock Offset Protocol, Rice Cultivation Protocol, MMC Protocol and the Urban Forest Protocol and associated projects would not result in a need for an increased level of public services beyond that already provided to existing facilities (ARB 2010a, ARB 2013b, ARB 2014a). Implementation of the U.S. Forest Offset Protocol would not alter the extent of forest activities, but would shift some activities to projects that sequester carbon. Because the level of overall forest activities would not change, the consequential need for public services would not change. Thus, this impact is considered less-than-significant (ARB 2010a).

Impacts associated with extension of the cap post-2020, extension of allowance allocation beyond 2020, incorporation of results of leakage studies for post-2020 industrial allocation, and compliance with CPP would result in similar reasonably foreseeable compliance responses as discussed in the 2010 FED, U.S. Forest Offset

Protocol Update EA, MMC Protocol EA, and Rice Cultivation Protocol EA. Thus, impacts to public services associated with extension of the cap post-2020, extension of allowance allocation beyond 2020, incorporation of results of leakage studies for post-2020 industrial allocation, and compliance with CPP would be **less-than-significant**.

15. Recreation

The cap-and-trade program, including the proposed compliance offset protocols and associated offset projects would not result in adverse impacts to recreation. The covered entity compliance responses consist of upgrading equipment, switching to lower intensity carbon fuels, and implementing maintenance and process changes. These actions would have a less-than-significant impact on recreation resources. All potential impacts to public services would be less-than-significant (ARB 2010a).

Eligible offset credits must be generated through projects that are in conformance with all applicable environmental, health, and safety regulations. Implementation of the ODS Offset Protocol, the Livestock Offset Protocol, Rice Cultivation Protocol, and the Urban Forest Offset Protocol, and associated offset projects would result in a less-than-significant impact on recreation resources (ARB 2010a, ARB 2014a). Implementation of the MMC Protocol could result in offset project located at abandoned mines which could potentially affect recreational uses on reclaimed mining lands. In the event that MMC offset projects would be located at abandoned mines where recreation activities are included as permitted uses under an approved mine reclamation plan, any such activities would be required to comply with federal and state permitting requirements under SMCRA through OSMRE or other state agencies with permitting authority. Therefore, any potential impacts related to recreation would be less-than-significant (ARB 2013b). Forest management activities could disrupt opportunities for forest recreation, but such disruptions exist under current conditions. Offset projects developed under the U.S. Forest Offset Protocol may include the construction of roads, temporary closures for tree installation and periodic increases in truck or construction equipment traffic that could disrupt recreational activities, but forest projects developed under the U.S. Forest Offset Protocol would occur on land that was historically forested or currently forested, and consequently, the overall impact to recreational resources would be less-than-significant (ARB 2010a).

Impacts associated with extension of the cap post-2020, extension of allowance allocation beyond 2020, incorporation of results of leakage studies for post-2020 industrial allocation, and compliance with CPP would result in similar reasonably foreseeable compliance responses as discussed in the 2010 FED, U.S. Forest Offset Protocol Update EA, MMC Protocol EA, and Rice Cultivation Protocol EA. Thus, impacts to recreation associated with extension of the cap post-2020, extension of allowance allocation beyond 2020, incorporation of results of leakage studies for post-2020 industrial allocation, and compliance with CPP would be **less-than-significant**.

16. Transportation and Traffic

Implementation of covered entity compliance responses is not expected to result in significant adverse impacts to transportation or traffic. If a facility expands or requires construction to take place, increases in construction traffic would be temporary and considered less-than-significant. Construction traffic impacts can be mitigated through ingress and egress controls, traffic controls, and reduced speed zones to ensure safety. Activities undertaken to develop offset projects would be expected to vary according to the type of offset project.

Eligible offset credits must be generated through projects that are in conformance with all applicable environmental, health, and safety regulations. Transportation and traffic impacts resulting from the implementation of ODS, Rice Cultivation, U.S. Forest, and Urban Forest Offset Protocol projects would be less-than-significant (ARB 2010a, ARB 2014a). Implementation of MMC projects could result in some short-term construction-related traffic from worker commute and material delivery trips; however, due to the isolated location of MMC offset projects, transportation and traffic impacts would be less-than-significant (ARB 2013b). Construction activities related to new livestock digesters could require the operation of heavy equipment on rural roads, potentially creating unsafe conditions. Recognized measures exist to reduce this potentially significant impact, but the authority to determine project-level impacts and require project-level mitigation lies with the permitting agency for individual projects. Further, the programmatic analysis does not allow project-specific details of mitigation, resulting in an inherent uncertainty in the degree of mitigation ultimately implemented to reduce the potentially significant impacts. Consequently, the 2010 FED took the conservative approach in its post-mitigation significance conclusion and disclosed, for CEQA compliance purposes, that this potentially significant impact may be unavoidable (ARB 2010a).

Impacts associated with extension of the cap post-2020, extension of allowance allocation beyond 2020, incorporation of results of leakage studies for post-2020 industrial allocation, and compliance with CPP would result in similar reasonably foreseeable compliance responses as discussed in the 2010 FED, U.S. Forest Offset Protocol Update EA, MMC Protocol EA, and Rice Cultivation Protocol EA. Thus, impacts to transportation and traffic associated with extension of the cap post-2020, extension of allowance allocation beyond 2020, incorporation of results of leakage studies for post-2020 industrial allocation, and compliance with CPP would be **potentially significant and unavoidable** related to implementation of Livestock Offset projects. Impacts related to actions taken by covered entities and the ODS, Urban Forest, U.S. Forest, Rice Cultivation, and MMC offset protocol projects would be **less-than-significant**.

17. Utilities and Service Systems

The covered entity compliance responses consist of upgrading equipment, switching to lower intensity carbon fuels, and implementing maintenance and process changes. These projects would not increase the level of utilities beyond that already provided to existing facilities. Fuel switching could require provision of new services. The availability and extension of utilities is subject to approval of the local utility provider, and thus mitigated to less-than-significant (ARB 2010a).

Implementation of the ODS, Livestock, Rice Cultivation, MMC, and Urban Forest offset protocols would not result in a demand for a significant increase in the level of utilities or service systems that may serve existing sites. Construction of new facilities could require the incidental extension of utilities and services. The availability and extension of utilities is subject to approval of the local utility provider, and impacts would be less-than-significant (ARB 2010a, ARB 2013b, ARB 2014a).

The U.S. Forest Offset Protocol would not alter the extent of forest activities, but could increase forest projects to sequester carbon. Because the level of overall forest activities would not change, the consequential need for utility service systems associated with those activities would not change. Thus, this impact is considered less-than-significant (ARB 2010a).

Impacts associated with extension of the cap post-2020, extension of allowance allocation beyond 2020, incorporation of results of leakage studies for post-2020 industrial allocation, and compliance with CPP would result in similar reasonably foreseeable compliance responses as discussed in the 2010 FED, U.S. Forest Offset Protocol Update EA, MMC Protocol EA, and Rice Cultivation Protocol EA. Thus, impacts to utilities and service systems associated with extension of the cap post-2020, extension of allowance allocation beyond 2020, incorporation of results of leakage studies for post-2020 industrial allocation, and compliance with CPP would be **less-than-significant**.

D. Impacts Related to Linkage with Ontario, Canada

This section describes environmental impacts that could result from linkage to Ontario, Canada. Linkage with Ontario, Canada would allow for credits to be obtained by covered entities under California's Cap-and-Trade Program for both allowances and offset credits, as described above in Section 2.C.4. The Proposed Project does not authorize implementation of Ontario's Cap-and-Trade Program. ARB lacks jurisdiction to implement any part of Ontario's Cap-and-Trade Program beyond the linkage elements included as part of the Proposed Project. Therefore, covered entity compliance obligations under Ontario's Cap-and-Trade Program exist independently of the Proposed Project. Any environmental effects resulting from covered entity compliance obligations under Ontario's Cap-and-Trade Program are therefore not attributable to the Proposed Project. However, for purposes of disclosure, ARB provides

information in this EA regarding what is currently known about potential environmental impacts that may result from implementation of Ontario's Cap-and-Trade Program. Linkage to the Ontario, Canada cap-and-trade program would result in the same types of actions anticipated for compliance with the California cap-and-trade program (i.e., actions to reduce GHG emissions, obtain allowances, or obtain offset credits).

Offset projects in Ontario, Canada would currently be limited to ODS, landfill gas, and MMC projects, the protocols for which would be developed by the Ontario, Canada government. Because the types of compliance responses would be similar regardless of whether they are in California, other U.S. locations, or Canada, they would be reasonably expected to be similar to those described in previous ARB environmental documents for the 2010 Cap-and-Trade Program, offset protocols, linkage with Québec, and the Regulation to Reduce Methane Emissions from Municipal Solid Waste Landfills, the relevant environmental analyses for which are summarized below. As described in Section 1.H, these documents have been incorporated by reference. Although the targeted emission sources for offsets would be similar (which is why types of compliance responses are also similar), California's offset protocols would not be implemented in Canada. The protocols in Canada would be developed in, and approved by, Ontario, Canada. For clarity in this Draft EA, offset projects that would occur in Canada are indicated as lowercase (i.e., mine methane capture projects, ODS offset projects, landfill gas offset projects) to avoid confusion with California's offset protocols.

1. Aesthetics

Linkage with Ontario, Canada would allow for allowances and offsets to be traded between Ontario, Québec, and California markets. As described in the 2010 FED for California's Cap-and-Trade Regulation, the covered entity compliance responses of upgrading equipment, decarbonization, and implementing process changes would result in less-than-significant aesthetics impacts (ARB 2010a). The covered entity compliance response of surrendering compliance instruments would result in no aesthetic impacts (ARB 2010a). The Proposed Project would not change how covered entities under California's Cap-and-Trade Program would comply as evaluated in the 2010 FED for California's Cap-and-Trade Regulation. Thus, aesthetic impacts associated with covered entity compliance responses associated with California's Cap-and-Trade Program would be less-than-significant and no mitigation would be necessary.

Implementation of the Proposed Amendments to California's Cap-and-Trade Regulation could result in entities that are covered under California's Cap-and-Trade Program seeking offset credits from mine methane capture, ODS, and landfill gas projects in Ontario, Canada and potentially in other parts of Canada. The reasonably foreseeable compliance responses associated with offset projects and covered entities activities to meet allowances in Ontario, Canada are assumed to be similar to those discussed in the 2010 FED, MMC Protocol EA (ARB 2013b), and the ISOR for ARB's Landfills Regulation (ARB 2009). Thus, the environmental analysis from these documents is

summarized below and incorporated by reference as described in Section 1.H of this Draft EA.

Impact 1. A: Aesthetic Impacts Related to Linkage to Ontario, Canada

The types of covered entity compliance responses anticipated to occur in Canada would be similar to activities associated with California's Cap-and-Trade Program. Thus, for the reasons described above under Section 4.C, aesthetic impacts would be **less-than-significant** for covered entities compliance responses associated with linkage with Ontario, Canada.

As described in the 2010 FED for California's Cap-and-Trade Regulation, implementation of the ODS protocol would result in no aesthetic impacts (e.g., adverse effects on scenic vistas, substantially damage or degrade scenic resources, existing visual character; or create a new source of substantial light or glare that would adversely affect day or nighttime views); therefore, mitigation would not be required (ARB 2010a). The ISOR for ARB's Landfills Regulation did not identify any potential significant impacts for aesthetics (ARB, 2009).

The MMC Protocol EA states that implementation of MMC projects could include the installation of mine methane gas extraction, capture, transportation, processing, destruction, and monitoring equipment at existing active or abandoned mine site. These activities are likely to be of similar size, scale, and visual character to those typical of active mining operation. However, abandoned mining sites and adjacent areas may have been subject to varying degrees of reclamation, reuse, and/or redevelopment since mine closure and abandonment. Construction of offset projects at abandoned mining sites could thus alter the visual character of such sites and adjacent surrounding areas, or introduce new sources of nighttime lighting that could adversely affect surrounding areas that may have been restored for active public recreation or uses other than mining. Under the MMC Protocol EA, compliance with relevant and applicable laws and regulations (e.g., Surface Mining Control and Reclamation Act [SMCRA]) would reduce the potential for conflicts with forest management, agricultural activities, or other existing land uses on affected reclaimed mining lands, and thus, aesthetic impacts were determined to be less-than-significant (ARB 2013b).

SMCRA does not apply to areas within Canada. While Canadian federal, provincial, and municipal environmental laws contain some requirements similar to those associated with SMCRA, it is unknown where and under which jurisdiction individual projects may be located. Thus, the authority to determine project-level impacts and applicable regulations lies with the permitting agency for individual projects. Further, the programmatic analysis does not allow project-specific details of mitigation, resulting in an inherent uncertainty in the degree of mitigation ultimately implemented to reduce the potentially significant impacts. Consequently, this Draft EA takes the conservative approach and discloses, for CEQA compliance purposes, that a potentially significant aesthetic impact may be unavoidable. The types of actions that would occur from

linkage with Ontario, Canada through the California Cap-and-Trade Regulation would be similar to those described above.

Aesthetic impacts associated with linkage with Ontario, Canada would be **potentially significant and unavoidable** related to implementation of mine methane capture projects; and **less-than-significant** related to ODS and landfill offset projects.

2. Agriculture and Forest Resources

Linkage with Ontario, Canada would allow for allowances and offsets to be traded between Canada and California markets. As described in the 2010 FED for California's Cap-and-Trade Regulation, the covered entity compliance responses of upgrading equipment, decarbonization, and implementing process change would result in less-than-significant agricultural and forest resource impacts (ARB 2010a). The covered entity compliance response of surrendering compliance instruments would result in no impacts associated with California's Cap-and-Trade Program (ARB 2010a). Thus, no mitigation for agricultural and forest resources was identified in the 2010 FED (ARB 2010a). The Proposed Project would not change how covered entities under California's Cap-and-Trade Program would comply as evaluated in the 2010 FED for California's Cap-and-Trade Regulation. Thus, agriculture and forest resource impacts associated with covered entities would not be affected as a result of implementation of the Proposed Project and no mitigation would be necessary in California.

Implementation of the Proposed Amendments to California's Cap-and-Trade Regulation could result in entities that are covered under California's Cap-and-Trade Program seeking offset credits from mine methane capture, ODS, and landfill gas projects in Ontario, Canada and potentially in other parts of Canada. The reasonably foreseeable compliance responses associated with offset projects and covered entities activities to meet allowances in Ontario, Canada are assumed to be similar to those discussed in the 2010 FED, MMC Protocol EA (ARB 2013b), and the ISOR for ARB's Landfills Regulation (ARB 2009). Thus, the environmental analysis from these documents is summarized below and incorporated by reference as described in Section 1.H of this Draft EA.

Impact 2.A: Agriculture and Forest Resources Impacts Related to Linkage to Ontario, Canada

The types of covered entity compliance responses anticipated to occur in Canada would be similar to activities associated with California's Cap-and-Trade Program. Thus, for the reasons described above under Section 4.C, agriculture and forest resources impacts would be **less-than-significant** for covered entities compliance responses associated with linkage with Ontario, Canada.

As described in the 2010 FED for California's Cap-and-Trade Regulation, implementation of ODS projects would result in no impacts for agricultural and forest resources, because projects would be limited to existing facilities (e.g., no effects

related to conversion of farmland to non-farmland uses, conflict with existing zoning, conflict with Williamson Act Contracts, conflict with forest land or timberland zoning, or loss or conversion of forest land to non-forest uses) (ARB 2010a). Thus, no mitigation for agricultural and forest resources was identified in the 2010 FED (ARB 2010a). The ISOR for ARB's Landfills Regulation did not identify any potential impacts for agricultural and forest resources (ARB 2009). Generally, projects associated with the MMC Protocol would be located in areas designated for mining; however, offset projects located at active or abandoned mines could be within or adjacent to forested areas. As described in the MMC Protocol EA, compliance with permitting requirements pursuant to SMCRA would avoid conflicts with reforestation activities or restoration of agricultural activities under any approved mine reclamation plans (ARB 2013b). However, SMCRA does not apply to areas within Canada. While Canadian federal, provincial, and municipal environmental laws contain some requirements similar to those associated with SMCRA, it is unknown where and under which jurisdiction individual projects may be located. Thus, the authority to determine project-level impacts and applicable regulations lies with the permitting agency for individual projects. Further, the programmatic analysis does not allow project-specific details of mitigation, resulting in an inherent uncertainty in the degree of mitigation ultimately implemented to reduce the potentially significant impacts. Consequently, this Draft EA takes the conservative approach and discloses, for CEQA compliance purposes, that potentially significant agricultural and forest resource impact may be unavoidable. The types of actions that would occur from linkage with Ontario, Canada through the California Cap-and-Trade Regulation would be similar to those described above.

Agriculture and forest resources impacts related to linkage to Ontario, Canada would be **potentially significant and unavoidable** related to mine methane capture offset projects; and **less-than-significant** related to ODS and landfill offset projects.

3. Air Quality

Linkage with Ontario, Canada would allow for allowances and offsets to be traded between Canada and California markets. As described in the 2010 FED for California's Cap-and-Trade Regulation, the covered entity compliance responses of upgrading equipment, decarbonization, and implementing process change could result in potentially significant air quality impacts from dust and equipment emissions. Recognized measures were identified as mitigation. However, because the authority to determine project-level impacts and require project-level mitigation lies with the permitting agency for individual projects, and that the programmatic analysis did not allow project-specific mitigation, there was inherent uncertainty in the degree of mitigation ultimately implemented to reduce the potentially significant impacts identified in the 2010 FED. Consequently, the 2010 FED took the conservative approach in its post-mitigation significance conclusion and disclosed, for CEQA compliance purposes, that the potentially significant impacts to air quality may be unavoidable in California. The Proposed Project would not change how covered entities under California's Cap-

and-Trade Program would comply as evaluated in the 2010 FED for California's Cap-and-Trade Regulation.

Implementation of the Proposed Amendments to California's Cap-and-Trade Regulation could result in entities that are covered under California's Cap-and-Trade Program seeking offset credits from mine methane capture, ODS, and landfill gas projects in Ontario, Canada. The reasonably foreseeable compliance responses associated with offset projects and covered entities activities to meet allowances in Ontario, Canada are assumed to be similar to those discussed in the 2010 FED, MMC Protocol EA (ARB 2013b), and the ISOR for ARB's Landfills Regulation (ARB 2009). Thus, the environmental analysis from these documents is summarized below and incorporated by reference as described in Section 1.H of this Draft EA.

Impact 3.A: Air Quality Impacts Related to Linkage with Ontario, Canada

The types of covered entity compliance responses anticipated to occur in Canada would be similar to activities associated with California's Cap-and-Trade Program. Thus, for the reasons described above under Section 4.C, air quality impacts would be **potentially significant and unavoidable** for covered entities compliance responses associated with linkage with Ontario, Canada.

As described in the 2010 FED, implementation of ODS offset projects would produce incidental criteria pollutant emissions from transportation and ODS destruction, which would be less-than-significant (ARB 2010a). Thus, no mitigation for GHG emissions resulting from ODS offset projects was proposed in the 2010 FED (ARB 2010a). The ISOR for ARB's Landfills Regulation determined that potential increases in criteria pollutant emissions would be less-than-significant (ARB 2009).

ARB expects that Ontario's offset protocols will allow for offset project development throughout Canada. Implementation of MMC offset projects in Canada would generally be located in areas designated for mining. As described in California's MMC Protocol EA, construction and operational activities associated with MMC offset projects could cause an increase in criteria pollutant or toxic air contaminant emissions (ARB 2013b). In the United States, offset projects located within locations designated as National Ambient Air Quality Standards (NAAQS) nonattainment areas would not be allowed to produce a net increase in criteria pollutant or precursor emissions, and would need to be considered within the context of a State Implementation Plan (SIP). However, these requirements do not apply to projects in Canada. Canada has Canadian Ambient Air Quality Standards (CAAQS) for PM10, PM2.5 and ozone; however, these are voluntary objectives. MMC offset projects in Canada would be subject to Canada's environmental regulations, which may vary depending on the project and location. It is unknown where and under which jurisdiction individual projects may be located. Thus, the authority to determine project-level impacts and applicable regulations lies with the permitting agency for individual projects. Further, the programmatic analysis approach does not allow for project-specific details of mitigation, resulting in an inherent uncertainty in the

degree of mitigation that ultimately would need to be implemented to reduce the potentially significant impacts. Consequently, this Draft EA takes the conservative approach and discloses, for CEQA compliance purposes, that **potentially significant air quality impacts may be unavoidable**. The types of actions that would occur from linkage with Ontario, Canada through the California Cap-and-Trade Regulation would be similar to those described above.

Air quality impacts related to linkage to Ontario, Canada would be **potentially significant and unavoidable** related to mine methane capture offset projects and **less-than-significant** related to ODS and landfill offset projects.

4. Biological Resources

Linkage with Ontario, Canada would allow for allowances and offsets to be traded between Canada and California markets. As described in the 2010 FED for California's Cap-and-Trade Regulation, the covered entity compliance responses of upgrading equipment, decarbonization, and implementing process change would result in potentially significant biological impacts from construction, grading, trenching, and general site disturbance activities. Recognized measures were identified as mitigation (e.g., preparation of biological inventory). However, because the authority to determine project-level impacts and require project-level mitigation lies with the permitting agency for individual projects, and that the programmatic analysis did not allow project-specific mitigation, there was inherent uncertainty in the degree of mitigation ultimately implemented to reduce the potentially significant impacts identified in the 2010 FED. Consequently, the 2010 FED took the conservative approach in its post-mitigation significance conclusion and disclosed, for CEQA compliance purposes, that the potentially significant impacts to biological resources may be unavoidable in California. The Proposed Project would not change how covered entities under California's Cap-and-Trade Program would comply as evaluated in the 2010 FED for California's Cap-and-Trade Regulation. Thus, biological resources impacts associated with covered entities would not be affected as a result of implementation of the Proposed Project.

Implementation of the Proposed Amendments to California's Cap-and-Trade Regulation could result in entities that are covered under California's Cap-and-Trade Program seeking offset credits from mine methane capture, ODS, and landfill gas projects in Ontario, Canada. The reasonably foreseeable compliance responses associated with offset projects and covered entities activities to meet allowances in Ontario, Canada are assumed to be similar to those discussed in the 2010 FED, MMC Protocol EA (ARB 2013b), and the ISOR for ARB's Landfills Regulation (ARB 2009). Thus, the environmental analysis from these documents is summarized below and incorporated by reference as described in Section 1.H of this Draft EA.

Impact 4.A: Biological Resources Impacts Related to Linkage with Ontario, Canada

The types of covered entity compliance responses anticipated to occur in Canada would be similar to activities associated with California's Cap-and-Trade Program. Thus, for the reasons described above under Section 4.C, biological resources impacts would be **potentially significant and unavoidable** for covered entities compliance responses associated with linkage to Ontario, Canada.

As described in the 2010 FED for California's Cap-and-Trade Regulation, implementation of the ODS Protocol would result in less-than-significant biological impacts because projects would occur with existing facilities and transport of ODS would occur on existing roads (e.g., adverse effect on special status species and habitats, impacts on wetlands, and interference with movement of native or migratory fish or wildlife) (ARB 2010a). Thus, no mitigation for biological impacts was identified in the 2010 FED (ARB 2010a). The ISOR for ARB's Landfills Regulation did identify an overall beneficial impact to vegetation because implementation would reduce landfill gases seeping through the cover and into the root zone, which can be injurious to many vegetation types (ARB 2009). The MMC Protocol EA identified potential significant impacts to biological resources because the installation of gas extraction, capture, transportation, processing, destruction, and monitoring equipment could cause direct and indirect impacts to special status species and habitats. These impacts could result from project-related activities such as construction of new equipment, interruption of water aquifers, and removal of water from abandoned mines. Recognized measures were identified as mitigation (e.g., preparation of a biological inventory). However, because the authority to determine project-level impacts and require project-level mitigation lies with the permitting agency for individual projects, and the programmatic analysis did not allow project-specific mitigation, there was inherent uncertainty in the degree of mitigation ultimately implemented to reduce the potentially significant impacts identified in the 2013 EA. Consequently, the 2013 EA took the conservative approach in its post-mitigation significance conclusion and disclosed, for CEQA compliance purposes, that the potentially significant impacts to biological resources may be unavoidable (ARB 2013b). The types of actions that would occur from linkage with Ontario, Canada through the California Cap-and-Trade Regulation would be similar to those described above.

Biological resources impacts associated with linkage with Ontario, Canada would be **potentially significant and unavoidable** related to mine methane capture offset projects; and **less-than-significant** related to ODS and landfill offset projects.

5. Cultural Resources

Linkage with Ontario, Canada would allow for allowances and offsets to be traded between Canada and California markets. As described in the 2010 FED for California's Cap-and-Trade Regulation, the covered entity compliance responses of upgrading equipment, decarbonization, and implementing process change would result in potentially significant cultural resources impacts (ARB 2010a). The covered entity compliance response of surrendering compliance instruments would result in no

impacts (ARB 2010a). Thus, impacts would be less-than-significant and no mitigation for cultural resources was identified in the 2010 FED (ARB 2010a) in California. The Proposed Project would not change how covered entities under California's Cap-and-Trade Program would comply as compared to the evaluation in the 2010 FED for California's Cap-and-Trade Regulation. Thus, cultural resources impacts associated with covered entities would not be affected as a result on implementation of the Proposed Project and no mitigation would be necessary.

Implementation of the Proposed Amendments to California's Cap-and-Trade Regulation could result in entities that are covered under California's Cap-and-Trade Program seeking offset credits from mine methane capture, ODS, and landfill gas projects in Ontario, Canada. The reasonably foreseeable compliance responses associated with offset projects and covered entities activities to meet allowances in Ontario, Canada are assumed to be similar to those discussed in the 2010 FED, MMC Protocol EA (ARB 2013b), and the ISOR for ARB's Landfills Regulation (ARB 2009). Thus, the environmental analysis from these documents is summarized below and incorporated by reference as described in Section 1.H of this Draft EA.

Impact 5.A: Cultural Resources Impacts Related to Linkage with Ontario, Canada

The types of covered entity compliance responses anticipated to occur in Canada would be similar to activities associated with California's Cap-and-Trade Program. Thus, for the reasons described above under Section 4.C, cultural resources impacts would be **potentially significant and unavoidable** for covered entities compliance responses associated with linkage to Ontario, Canada.

As described in the 2010 FED for California's Cap-and-Trade Regulation, implementation of the ODS Protocol would result in no impacts to cultural resources; thus, no mitigation was identified in the 2010 FED (ARB 2010a). The ISOR for ARB's Landfills Regulation did not identify any potential impacts for cultural resources (ARB 2009). However, implementation of MMC projects could result in potentially significant cultural resources impacts (e.g., impacts to archaeological resources, historic resources, paleontological resources, and undocumented human remains) from ground disturbing activities. Recognized measures were identified as mitigation. However, because the authority to determine project-level impacts and require project-level mitigation lies with the permitting agency for individual projects, and the programmatic analysis did not allow project-specific mitigation, there was inherent uncertainty in the degree of mitigation that would ultimately need to be implemented to reduce the potentially significant impacts identified in the 2013 EA. Consequently, the 2013 EA took the conservative approach in its post-mitigation significance conclusion and disclosed, for CEQA compliance purposes, that the potentially significant impacts to cultural resources may be unavoidable (ARB 2013b). The types of actions that would occur from linkage with Ontario, Canada through the California Cap-and-Trade Regulation would be similar to those described above.

Cultural resources impacts associated with linkage with Ontario, Canada would be **potentially significant and unavoidable** related to mine methane capture offset projects; and **less-than-significant** related to ODS and landfill offset projects.

6. Energy Demand

Linkage with Ontario, Canada would allow for allowances and offsets to be traded between Canada and California markets. As described in the 2010 FED for California's Cap-and-Trade Regulation, the covered entity compliance responses of upgrading equipment, decarbonization, and implementing process change would result in beneficial impacts to energy demand (ARB 2010a). Thus, no mitigation for energy demand was identified in the 2010 FED (ARB 2010a). The Proposed Project would not change how covered entities under California's Cap-and-Trade Program would comply compared with the evaluation in the 2010 FED for California's Cap-and-Trade Regulation. Thus, energy demand impacts associated with covered entities would not be affected as a result of implementation of the Proposed Project and no mitigation would be necessary in California.

Implementation of the Proposed Amendments to California's Cap-and-Trade Regulation could result in entities that are covered under California's Cap-and-Trade Program seeking offset credits from mine methane capture, ODS, and landfill gas projects in Ontario, Canada. The reasonably foreseeable compliance responses associated with offset projects and covered entities activities to meet allowances in Ontario, Canada are assumed to be similar to those discussed in the 2010 FED, MMC Protocol EA (ARB 2013b), and the ISOR for ARB's Landfills Regulation (ARB 2009). Thus, the environmental analysis from these documents is summarized below and incorporated by reference as described in Section 1.H of this Draft EA.

Impact 6.A: Energy Demand Impacts Related to Linkage with Ontario, Canada

The types of covered entity compliance responses anticipated to occur in Canada would be similar to activities associated with California's Cap-and-Trade Program. Thus, for the reasons described above under Section 4.C, energy demand impacts would be **beneficial** for covered entities compliance responses associated with linkage to Ontario, Canada.

As described in the 2010 FED for California's Cap-and-Trade Regulation, implementation of the ODS Protocol would not require new or expanded electricity or natural gas facilities, or otherwise result in substantial increased demand for energy (ARB 2010a). Thus, no mitigation for public services was identified in the 2010 FED (ARB 2010a). The ISOR for ARB's Landfills Regulation determined impacts for energy demand would be less-than-significant (ARB 2009). Implementation of MMC projects could increase the supplies of electricity and natural gas, thus providing beneficial effects. The types of actions that would occur from linkage with Ontario, Canada

through the California Cap-and-Trade Regulation would be similar to those described above.

Energy demand impacts associated with linkage with Ontario, Canada would be **beneficial** related to ODS, and mine methane capture offset projects, and less-than-significant related to landfill offset projects.

7. Geology, Soils, and Mineral Resources

Linkage with Ontario, Canada would allow for allowances and offsets to be traded between Canada and California markets. As described in the 2010 FED for California's Cap-and-Trade Regulation, the covered entity compliance responses of upgrading equipment and decarbonization could result in potentially significant geology, soils, and mineral resources impacts from construction, grading, trenching, and general site disturbance activities. Recognized measures were identified as mitigation. However, because the authority to determine project-level impacts and require project-level mitigation lies with the permitting agency for individual projects, and the programmatic analysis did not allow project-specific mitigation, there was inherent uncertainty in the degree of mitigation that would ultimately need to be implemented to reduce the potentially significant impacts identified in the 2010 FED. Consequently, the 2010 FED took the conservative approach in its post-mitigation significance conclusion and disclosed, for CEQA compliance purposes, that the potentially significant impacts to geology, soils, and mineral resources may be unavoidable in California.

The covered entity compliance response of implementing process changes would result in less-than-significant geology, soils and mineral resources impacts (ARB 2010a). The covered entity compliance response of surrendering compliance instruments would result in no impacts (ARB 2010a). Thus, no mitigation was identified for assessment of these two compliance responses (ARB 2010a).

Implementation of the Proposed Amendments to California's Cap-and-Trade Regulation could result in entities that are covered under California's Cap-and-Trade Program seeking offset credits from mine methane capture, ODS, and landfill gas projects in Ontario, Canada. The reasonably foreseeable compliance responses associated with offset projects and covered entities activities to meet allowances in Ontario, Canada are assumed to be similar to those discussed in the 2010 FED, MMC Protocol EA (ARB 2013b), and the ISOR for ARB's Landfills Regulation (ARB 2009). Thus, the environmental analysis from these documents is summarized below and incorporated by reference as described in Section 1.H of this Draft EA.

Impact 7.A: Geology, Soils, and Mineral Resources Impacts Related to Linkage with Ontario, Canada

The types of covered entity compliance responses anticipated to occur in Canada would be similar to activities associated with California's Cap-and-Trade Program. Thus, for the reasons described above under Section 4.C, geology, soils, and mineral resources

impacts would be **potentially significant and unavoidable** for covered entities compliance responses associated with linkage to Ontario, Canada.

As described in the 2010 FED for California's Cap-and-Trade Regulation, implementation of the ODS Protocol would result in less-than-significant or no impacts for geology, soils, and mineral resources (e.g., seismic impacts, unstable soils impacts, and expansive soils impacts (ARB 2010a). Thus, no mitigation for geology and soils was identified in the 2010 FED (ARB 2010a). The ISOR for ARB's Landfills Regulation did not identify any potential impacts for geology and soils (ARB, 2009). Implementation of the MMC Protocol could require the drilling of new methane drainage wells and boreholes, trenching for gathering pipelines, and other activities involving new ground disturbance and excavation. Some minor soil erosion impacts may result from the installation of new equipment; however, Offset Project Operators would be required to implement MMC projects in accordance with all federal, state and local regulations to control erosion, drainage, and grading pursuant to SMCRA, the Clean Water Act, the Soil and Water Resources Conservation Act and other similar laws, which are considered sufficient to mitigate potential impact to geology, soils and mineral resources to a less-than-significant level (ARB 2013b). However, this regulation does not apply to areas within Canada, and has authority only in areas within the United States. While Canadian federal, provincial, and municipal environmental laws contain some requirements similar to those associated with SMCRA, it is unknown where and under which jurisdiction individual projects may be located. Thus, the authority to determine project-level impacts and applicable regulations lies with the permitting agency for individual projects. Further, the programmatic analysis does not allow project-specific details of mitigation, resulting in an inherent uncertainty in the degree of mitigation ultimately implemented to reduce the potentially significant impacts. Consequently, this Draft EA takes the conservative approach and discloses, for CEQA compliance purposes, that this potentially significant impact may be unavoidable. The types of actions that would occur from linkage with Ontario, Canada through the California Cap-and-Trade Regulation would be similar to those described above.

Geology, soils, and mineral resources impacts related to linkage with Ontario, Canada would be **potentially significant and unavoidable** related to implementation of mine methane capture offset projects, and **less-than-significant** related to ODS and landfill offset projects.

8. Greenhouse Gases

Linkage with Ontario, Canada would allow for allowances and offsets to be traded between Canada and California markets. As described in the 2010 FED for California's Cap-and-Trade Regulation, the covered entity compliance responses of upgrading equipment, decarbonization, and implementing process change would result in reduced GHG emissions. The Proposed Project would not change how covered entities under California's Cap-and-Trade Program would comply compared with the evaluation in the 2010 FED for California's Cap-and-Trade Regulation. Thus, statewide GHG emission

impacts as a result of implementation of the Proposed Project would continue to be beneficial, and no mitigation would be necessary in California.

Implementation of the Proposed Amendments to California's Cap-and-Trade Regulation could result in entities that are covered under California's Cap-and-Trade Program seeking offset credits from mine methane capture, ODS, and landfill gas projects in Ontario, Canada. The reasonably foreseeable compliance responses associated with offset projects and covered entities activities to meet allowances in Ontario, Canada are assumed to be similar to those discussed in the 2010 FED, MMC Protocol EA (ARB 2013b), and the ISOR for ARB's Landfills Regulation (ARB 2009). Thus, the environmental analysis from these documents is summarized below and incorporated by reference as described in Section 1.H of this Draft EA.

Impact 8.A: Greenhouse Gas Impacts Related to Linkage with Ontario, Canada

The types of covered entity compliance responses anticipated to occur in Canada would be similar to activities associated with California's Cap-and-Trade Program. Thus, for the reasons described above under Section 4.C, GHG emissions impacts would be **beneficial** for covered entities compliance responses associated with linkage with Ontario, Canada.

ARB expects that Ontario, Canada's offset protocols will allow for offset project development throughout Canada. GHG impacts related to implementation of Ontario, Canada's ODS protocol would be similar to those discussed in the 2010 FED. As described in the 2010 FED, implementation of ODS offset projects would result in the destruction of ODS used in refrigeration systems and foam blowing applications that, under a business as usual scenario, are assumed to leak into the atmosphere over time. Therefore, destruction of ODS reduces GHG emissions, which is considered a beneficial effect.

GHG impacts related to implementation of Ontario, Canada's mine methane capture protocol and landfill gas protocol would be similar to those discussed in California's MMC Protocol EA (ARB 2013b) and the ISOR for ARB's Landfills Regulation (ARB 2009), respectively. As described in California's MMC Protocol EA, methane destruction devices employed as part of a MMC offset project would result in an increase in CO_2 emissions associated with the combustion of methane in ventilation air and mine gas. Similarly, implementation of landfill gas projects would result in an increase in CO_2 emissions associated with the combustion of methane in landfill gas. These emissions, however, would be in lieu of release of methane, which has a significantly higher Global Warming Potential (GWP) than CO_2. Therefore, combustion of methane and the associated conversion to CO_2 would result in a net reduction in GHG remissions and the associated climate change impacts would be beneficial.

GHG impacts related to linkage to Ontario, Canada would be **beneficial** related to mine methane capture, ODS, and landfill offset projects.

9. Hazards and Hazardous Materials

Linkage with Ontario, Canada would allow for allowances and offsets to be traded between Canada and California markets. As described in the 2010 FED for California's Cap-and-Trade Regulation, the covered entity compliance responses of upgrading equipment and decarbonization would result in less-than-significant hazards and hazardous materials impacts (ARB 2010a). The covered entity compliance response of implementing process changes would result in beneficial impacts, and surrendering compliance instruments would result in no impacts (ARB 2010a). Thus, no mitigation for hazards and hazardous materials was identified in the 2010 FED (ARB 2010a). The Proposed Project would not change how covered entities under California's Cap-and-Trade Program would comply as evaluated in the 2010 FED for California's Cap-and-Trade Regulation. Thus, hazards and hazardous materials impacts associated with covered entity compliance responses would not be affected as a result of implementation of the Proposed Project, and no mitigation would be necessary in California.

Implementation of the Proposed Amendments to California's Cap-and-Trade Regulation could result in entities that are covered under California's Cap-and-Trade Program seeking offset credits from mine methane capture, ODS, and landfill gas projects in Ontario, Canada. The reasonably foreseeable compliance responses associated with offset projects and covered entities activities to meet allowances in Ontario, Canada are assumed to be similar to those discussed in the 2010 FED, MMC Protocol EA (ARB 2013b), and the ISOR for ARB's Landfills Regulation (ARB 2009). Thus, the environmental analysis from these documents is summarized below and incorporated by reference as described in Section 1.H of this Draft EA.

Impact 9.A: Hazards and Hazardous Materials Impacts Related to Linkage with Ontario, Canada

The types of covered entity compliance responses anticipated to occur in Canada would be similar to activities associated with California's Cap-and-Trade Program. Thus, for the reasons described above under Section 4.C, hazards and hazardous materials impacts would be **less-than-significant** for covered entities compliance responses associated with linkage with Ontario, Canada.

As described in the 2010 FED for California's Cap-and-Trade Regulation, implementation of the ODS Protocol would result in less-than-significant impacts for hazards and hazardous materials (e.g., impacts related to the routine transport, disposal, and transportation of hazardous materials, impacts related to the release of hazardous materials to the environment or near schools, impacts related to creating a significant hazard to the public or the environment, impacts related to creating conflicts with emergency response plans, and exposure of people to increases in wildland fire risks) (ARB 2010a). The ISOR for ARB's Landfills Regulation did not identify any potential impacts for hazards and hazardous materials (ARB, 2009). Implementation of

MMC projects would result in less-than-significant impacts related to hazards and hazardous materials due to implementation of regulations such as SMCRA (ARB 2013b). However, this regulation does not apply to areas within Canada, and has authority only in areas within the United States. While Canadian federal, provincial, and municipal environmental laws contain some requirements similar to those associated with SMCRA, it is unknown where and under which jurisdiction individual projects may be located. Thus, the authority to determine project-level impacts and applicable regulations lies with the permitting agency for individual projects. Further, the programmatic analysis does not allow project-specific details of mitigation, resulting in an inherent uncertainty in the degree of mitigation that would ultimately need to be implemented to reduce the potentially significant impacts. Consequently, this Draft EA takes the conservative approach and discloses, for CEQA compliance purposes, that this potentially significant impact may be unavoidable. The types of actions that would occur from linkage with Ontario, Canada through the California Cap-and-Trade Regulation would be similar to those described above.

Hazards and hazardous materials impacts would be **potentially significant and unavoidable** related to mine methane capture offset projects, and **less-than-significant** related to ODS and landfill offset projects.

10. Hydrology and Water Quality

Linkage with Ontario, Canada would allow for allowances and offsets to be traded between Canada and California markets. As described in the 2010 FED for California's Cap-and-Trade Regulation, the covered entity compliance responses of upgrading equipment and decarbonization could result in potentially significant hydrology and water quality impacts from construction, grading, trenching, and general site disturbance activities. Recognized measures were identified as mitigation. However, because the authority to determine project-level impacts and require project-level mitigation lies with the permitting agency for individual projects, and the programmatic analysis did not allow project-specific mitigation, there was inherent uncertainty in the degree of mitigation that would ultimately need to be implemented to reduce the potentially significant impacts identified in the 2010 FED. Consequently, the 2010 FED took the conservative approach in its post-mitigation significance conclusion and disclosed, for CEQA compliance purposes, that the potentially significant impacts to hydrology and water quality may be unavoidable. The Proposed Project would not change how covered entities under California's Cap-and-Trade Program would comply as compared to the evaluation in the 2010 FED for California's Cap-and-Trade Regulation. Thus, hydrology and water quality impacts associated with covered entities would not be affected as a result of implementation of the Proposed Project and no mitigation would be necessary in California.

Implementation of the Proposed Amendments to California's Cap-and-Trade Regulation could result in entities that are covered under California's Cap-and-Trade Program seeking offset credits from mine methane capture, ODS, and landfill gas projects in

Ontario, Canada. The reasonably foreseeable compliance responses associated with offset projects and covered entities activities to meet allowances in Ontario, Canada are assumed to be similar to those discussed in the 2010 FED, MMC Protocol EA (ARB 2013b), and the ISOR for ARB's Landfills Regulation (ARB 2009). Thus, the environmental analysis from these documents is summarized below and incorporated by reference as described in Section 1.H of this Draft EA.

Impact 10.A: Hydrology and Water Quality Impacts Related to Linkage with Ontario, Canada

The types of covered entity compliance responses anticipated to occur in Canada would be similar to activities associated with California's Cap-and-Trade Program. Thus, for the reasons described above under Section 4.C, hydrology and water quality impacts would be **potentially significant and unavoidable** for covered entities compliance responses associated with linkage to Ontario, Canada.

As described in the 2010 FED for California's Cap-and-Trade Regulation, implementation of the ODS Protocol would result in less-than-significant or no impacts for hydrology and water quality (e.g., impacts related to violation of existing water quality standards and waste discharge requirements, depletion of groundwater, alteration of existing drainage, degradation of water quality, and exceedance of the capacity of existing stormwater systems) (ARB 2010a). The ISOR for ARB's Landfills Regulation stated that there would be no expected impacts on the effectiveness of liners or the operation of leachate removal systems used at modern landfills to prevent contamination to the groundwater and, in some cases, may help reduce the methane levels in groundwater (ARB, 2009). Implementation of the MMC Protocol may include drilling of new methane drainage wells and boreholes. Drilling and well development can result in the removal of significant amounts of groundwater resulting from drawdown of water in the coalbed. The groundwater extracted during drilling, known as produced water. Produced water must be treated and disposed of properly or risk contamination of soils or surface waters. In addition operation of a methane drainage well would continue to create produced water. All projects implemented under the MMC Protocol must be in accordance with all applicable federal, state, and local regulations and regulatory oversight requirements in order to be issued credits for emission reductions. Consequently, the potential impacts to hydrology and water quality would likely not be adverse, and where an adverse impact may occur, would be less than significant due to the required compliance with laws and regulations (ARB 2013b). However, this regulation does not apply to areas within Canada, and has authority only in areas within the United States. While Canadian federal, provincial, and municipal environmental laws contain some requirements similar to those associated with SMCRA, it is unknown where and under which jurisdiction individual projects may be located. Thus, the authority to determine project-level impacts and applicable regulations lies with the permitting agency for individual projects. Further, the programmatic analysis does not allow project-specific details of mitigation, resulting in an inherent uncertainty in the degree of mitigation that would ultimately need to be implemented to reduce the potentially significant impacts. Consequently, this Draft EA takes the conservative approach and discloses, for CEQA compliance purposes,

that this potentially significant impact may be unavoidable. The types of actions that would occur from linkage with Ontario, Canada through the California Cap-and-Trade Regulation would be similar to those described above.

Hydrology and water quality impacts associated with linkage with Ontario, Canada would be **potentially significant and unavoidable** related to implementation of mine methane capture offset projects, and **less-than-significant** related to ODS and landfill offset projects.

11. Land Use and Planning

Linkage with Ontario, Canada would allow for allowances and offsets to be traded between Canada and California markets. As described in the 2010 FED for California's Cap-and-Trade Regulation, the covered entity compliance responses of upgrading equipment, decarbonization, and implementing process change would result in less-than-significant land use and planning impacts (ARB 2010a). The covered entity compliance response of surrendering compliance instruments would result in no impacts (ARB 2010a). Thus, no mitigation for land use and planning was identified in the 2010 FED (ARB 2010a). The Proposed Project would not change how covered entities under California's Cap-and-Trade Program would comply compared to the evaluation in the 2010 FED for California's Cap-and-Trade Regulation. Thus, land use and planning impacts associated with covered entities would not be affected as a result on implementation of the Proposed Project and no mitigation would be necessary in California.

Implementation of the Proposed Amendments to California's Cap-and-Trade Regulation could result in entities that are covered under California's Cap-and-Trade Program seeking offset credits from mine methane capture, ODS, and landfill gas projects in Ontario, Canada. The reasonably foreseeable compliance responses associated with offset projects and covered entities activities to meet allowances in Ontario, Canada are assumed to be similar to those discussed in the 2010 FED, MMC Protocol EA (ARB 2013b), and the ISOR for ARB's Landfills Regulation (ARB 2009). Thus, the environmental analysis from these documents is summarized below and incorporated by reference as described in Section 1.H of this Draft EA.

Impact 11.A: Land Use and Planning Impacts Related to Linkage with Ontario, Canada

The types of covered entity compliance responses anticipated to occur in Canada would be similar to activities associated with California's Cap-and-Trade Program. Thus, for the reasons described above under Section 4.C, land use and planning impacts would be **less-than-significant** for covered entities compliance responses associated with Ontario, Canada.

As described in the 2010 FED for California's Cap-and-Trade Regulation, implementation of the ODS Protocol would result in less-than-significant impacts for

land use and planning (e.g., impacts related to conflicts with relevant plans or policies and impacts related to division of an established community (ARB 2010a). The ISOR for ARB's Landfills Regulation did not identify any potential impacts for land use and planning (ARB, 2009). Implementation of the MMC Protocol could result in the installation of mine methane gas extraction, capture, transportation, treatment, destruction, and monitoring equipment would be situated at either active or abandoned mines throughout the United States. Mine methane management can be considered an integral part of mine operations and therefore would not result in land use conflicts at active mines. In some circumstances, MMC offset projects located at abandoned mines could be located within or adjacent to areas where reclamation has occurred subsequent to a mine's closure and abandonment. Mine reclamation activities such as re-vegetation, reforestation, and geomorphological restoration on abandoned mine lands can also eventually lead to restored public use. Any MMC compliance response activities at abandoned mining sites would be required to comply with federal, state and local permitting requirements under SMCRA or applicable land use and zoning regulations that are in effect subsequent to completion of reclamation activities, in order to avoid potential land use conflicts on abandoned mining lands. Thus, impacts related to land use and planning would, therefore, be considered less than significant. However, this regulation does not apply to areas within Canada, and has authority only in areas within the United States. While Canadian federal, provincial, and municipal environmental laws contain some requirements similar to those associated with SMCRA, it is unknown where and under which jurisdiction individual projects may be located. Thus, the authority to determine project-level impacts and applicable regulations lies with the permitting agency for individual projects. Further, the programmatic analysis does not allow project-specific details of mitigation, resulting in an inherent uncertainty in the degree of mitigation ultimately implemented to reduce the potentially significant impacts. Consequently, this Draft EA takes the conservative approach and discloses, for CEQA compliance purposes, that this potentially significant impact may be unavoidable. The types of actions that would occur from linkage with Ontario, Canada through the California Cap-and-Trade Regulation would be similar to those described above.

Land use and planning impacts associated with linkage with Ontario, Canada would be **potentially significant and unavoidable** related to mine methane capture offset projects, and **less-than-significant** related to ODS and landfill offset projects.

12. Noise

Linkage with Ontario, Canada would allow for allowances and offsets to be traded between Canada and California markets. As described in the 2010 FED for California's Cap-and-Trade Regulation, the covered entity compliance responses of upgrading equipment, decarbonization, and implementing process change would result in less-than-significant noise impacts (ARB 2010a). The covered entity compliance response of surrendering compliance instruments would result in no impacts and require no mitigation (ARB 2010a). The Proposed Project would not change how covered entities under California's Cap-and-Trade Program would comply compared with the evaluation in the 2010 FED for California's Cap-and-Trade Regulation. Thus, noise impacts

associated with covered entities would not be affected as a result on implementation of the Proposed Project and no mitigation would be necessary in California.

Implementation of the Proposed Amendments to California's Cap-and-Trade Regulation could result in entities that are covered under California's Cap-and-Trade Program seeking offset credits from mine methane capture, ODS, and landfill gas projects in Ontario, Canada. The reasonably foreseeable compliance responses associated with offset projects and covered entities activities to meet allowances in Ontario, Canada are assumed to be similar to those discussed in the 2010 FED, MMC Protocol EA (ARB 2013b), and the ISOR for ARB's Landfills Regulation (ARB 2009). Thus, the environmental analysis from these documents is summarized below and incorporated by reference as described in Section 1.H of this Draft EA.

Impact 12.A: Noise Impacts Related to Linkage with Ontario, Canada

The types of covered entity compliance responses anticipated to occur in Canada would be similar to activities associated with California's Cap-and-Trade Program. Thus, for the reasons described above under Section 4.C, noise impacts would be **less-than-significant** for covered entities compliance responses associated with linkage with Ontario, Canada.

As described in the 2010 FED for California's Cap-and-Trade Regulation, implementation of the ODS Protocol would result in less-than-significant impacts to noise; thus, no mitigation was identified in the 2010 FED (ARB 2010a). The ISOR for ARB's Landfills Regulation determined that given the options to mitigate noise and the remoteness of the uncontrolled landfills, compliance with the regulation would result in a less-than-significant impact on noise. (ARB 2009). Implementation of the MMC Protocol would involve the installation of methane capture and destruction equipment and some projects may involve the installation of gas processing equipment and/or gathering lines and operation of new stationary noise sources (e.g., compressors, flares, oxidizers). Because offset project operators at active mines would be required to comply with any existing federal, state, and local noise codes applicable to the associated jurisdiction, and mines are generally located in rural areas and are often isolated, noise impacts associated with MMC projects would be less-than-significant (ARB 2013b). The types of actions that would occur from linkage with Ontario, Canada through the California Cap-and-Trade Regulation would be similar to those described above.

Noise impacts associated with linkage with Ontario, Canada would be **less-than-significant** related to implementation of ODS, landfill, and mine methane capture offset projects.

13. Population, Employment and Housing

Linkage with Ontario, Canada would allow for allowances and offsets to be traded between Canada and California markets. As described in the 2010 FED for California's Cap-and-Trade Regulation, the covered entity compliance responses of upgrading

equipment, decarbonization, and implementing process change would result in less-than-significant population and housing impacts (ARB 2010a). The covered entity compliance response of surrendering compliance instruments would result in no impacts (ARB 2010a). Thus, no mitigation for population and housing was identified in the 2010 FED (ARB 2010a). The Proposed Project would not change how covered entities under California's Cap-and-Trade Program would comply compared with the evaluation in the 2010 FED for California's Cap-and-Trade Regulation. Thus, population and housing impacts associated with covered entities would not be affected as a result of implementation of the Proposed Project and no mitigation would be necessary in California.

Implementation of the Proposed Amendments to California's Cap-and-Trade Regulation could result in entities that are covered under California's Cap-and-Trade Program seeking offset credits from mine methane capture, ODS, and landfill gas projects in Ontario, Canada. The reasonably foreseeable compliance responses associated with offset projects and covered entities activities to meet allowances in Ontario, Canada are assumed to be similar to those discussed in the 2010 FED, MMC Protocol EA (ARB 2013b), and the ISOR for ARB's Landfills Regulation (ARB 2009). Thus, the environmental analysis from these documents is summarized below and incorporated by reference as described in Section 1.H of this Draft EA.

Impact 13.A: Population, Employment, and Housing Impacts Related to Linkage with Ontario, Canada

The types of covered entity compliance responses anticipated to occur in Canada would be similar to activities associated with California's Cap-and-Trade Program. Thus, for the reasons described above under Section 4.C, population, employment, and housing impacts would be **less-than-significant** for covered entities compliance responses associated with linkage with Ontario, Canada.

As described in the 2010 FED for California's Cap-and-Trade Regulation, implementation of the ODS Protocol would result in less-than-significant impacts for population and housing (e.g., impacts related to displacement of housing or people and substantial inducement of population growth) (ARB 2010a). The ISOR for ARB's Landfills Regulation did not identify any potential impacts for population and housing (ARB, 2009). Implementation of MMC projects would not be expected to result in population growth in affected areas because they would be located at or adjacent to existing mining operations and would not require a substantial number of employees (ARB 2013b). The types of actions that would occur from linkage with Ontario, Canada through the California Cap-and-Trade Regulation would be similar to those described above.

Population, employment, and housing impacts associated with linkage with Ontario, Canada would be **less-than-significant** related to implementation of ODS, landfill, and mine methane capture offset projects

14. Public Services

Linkage with Ontario, Canada would allow for allowances and offsets to be traded between Canada and California markets. As described in the 2010 FED for California's Cap-and-Trade Regulation, the covered entity compliance responses of upgrading equipment, decarbonization, and implementing process change would result in less-than-significant public services impacts (ARB 2010a). The covered entity compliance response of surrendering compliance instruments would result in no impacts (ARB 2010a). Thus, no mitigation for public services was identified in the 2010 FED (ARB 2010a). The Proposed Project would not change how covered entities under California's Cap-and-Trade Program would comply compared with the evaluation in the 2010 FED for California's Cap-and-Trade Regulation. Thus, public services impacts associated with covered entities would not be affected as a result of implementation of the Proposed Project and no mitigation would be necessary in California.

Implementation of the Proposed Amendments to California's Cap-and-Trade Regulation could result in entities that are covered under California's Cap-and-Trade Program seeking offset credits from mine methane capture, ODS, and landfill gas projects in Ontario, Canada. The reasonably foreseeable compliance responses associated with offset projects and covered entities activities to meet allowances in Ontario, Canada are assumed to be similar to those discussed in the 2010 FED, MMC Protocol EA (ARB 2013b), and the ISOR for ARB's Landfills Regulation (ARB 2009). Thus, the environmental analysis from these documents is summarized below and incorporated by reference as described in Section 1.H of this Draft EA.

Impact 14.A: Public Services Impacts Related to Linkage with Ontario, Canada

The types of covered entity compliance responses anticipated to occur in Canada would be similar to activities associated with California's Cap-and-Trade Program. Thus, for the reasons described above under Section 4.C, public services impacts would be **less-than-significant** for covered entities compliance responses associated with linkage with Ontario, Canada.

As described in the 2010 FED for California's Cap-and-Trade Regulation, implementation of the ODS Protocol would result in less-than-significant impacts for public services (e.g., impacts related to the provision of public services) (ARB 2010a). The ISOR for ARB's Landfills Regulation did not identify any potential impacts for public services (ARB, 2009). Implementation of MMC projects would not result in additional housing or other facilities that would increase the demand for public services; thus, there would be no impacts (ARB 2013b). The types of actions that would occur from linkage with Ontario, Canada through the California Cap-and-Trade Regulation would be similar to those described above.

Public services impacts associated with linkage with Ontario, Canada would be **less-than-significant** related to ODS, landfill, and mine methane capture offset projects.

15. Recreation

Linkage with Ontario, Canada would allow for allowances and offsets to be traded between Canada and California markets. As described in the 2010 FED for California's Cap-and-Trade Regulation, the covered entity compliance responses of upgrading equipment, decarbonization, and implementing process change would result in less-than-significant recreation impacts (ARB 2010a). The covered entity compliance response of surrendering compliance instruments would result in no impacts (ARB 2010a). Thus, no mitigation for recreation was identified in the 2010 FED (ARB 2010a). The Proposed Project would not change how covered entities under California's Cap-and-Trade Program would comply compared with the evaluation in the 2010 FED for California's Cap-and-Trade Regulation. Thus, recreation impacts associated with covered entities would not be affected as a result of implementation of the Proposed Project and no mitigation would be necessary in California.

Implementation of the Proposed Amendments to California's Cap-and-Trade Regulation could result in entities that are covered under California's Cap-and-Trade Program seeking offset credits from mine methane capture, ODS, and landfill gas projects in Ontario, Canada. The reasonably foreseeable compliance responses associated with offset projects and covered entities activities to meet allowances in Ontario, Canada are assumed to be similar to those discussed in the 2010 FED, MMC Protocol EA (ARB 2013b), and the ISOR for ARB's Landfills Regulation (ARB 2009). Thus, the environmental analysis from these documents is summarized below and incorporated by reference as described in Section 1.H of this Draft EA.

Impact 15.A: Recreation Impacts Related to Linkage with Ontario, Canada

The types of covered entity compliance responses anticipated to occur in Canada would be similar to activities associated with California's Cap-and-Trade Program. Thus, for the reasons described above under Section 4.C, recreation impacts would be **less-than-significant** for covered entities compliance responses associated with linkage with Ontario, Canada.

As described in the 2010 FED for California's Cap-and-Trade Regulation, implementation of the ODS Protocol would result in less-than-significant impacts for recreation (e.g., impacts to recreational facilities) (ARB 2010a). The ISOR for ARB's Landfills Regulation did not identify any potential impacts for recreation (ARB, 2009). Implementation of the MMC Protocol could result in offset project located at abandoned mines which could potentially affect recreational uses on reclaimed mining lands. In the event that MMC offset projects would be located at abandoned mines where recreation activities are included as permitted uses under an approved mine reclamation plan, any such activities would be required to comply with federal and state permitting requirements under SMCRA through OSMRE or other state agencies with permitting authority. Therefore, any potential impacts related to recreation would be less-than-significant (ARB 2013b). However, this regulation does not apply to areas within Canada, and has authority only

in areas within the United States. While Canadian federal, provincial, and municipal environmental laws contain some requirements similar to those associated with SMCRA, it is unknown where and under which jurisdiction individual projects may be located. Thus, the authority to determine project-level impacts and applicable regulations lies with the permitting agency for individual projects. Further, the programmatic analysis does not allow project-specific details of mitigation, resulting in an inherent uncertainty in the degree of mitigation ultimately implemented to reduce the potentially significant impacts. Consequently, this Draft EA takes the conservative approach and discloses, for CEQA compliance purposes, that this potentially significant impact may be unavoidable. The types of actions that would occur from linkage with Ontario, Canada through the California Cap-and-Trade Regulation would be similar to those described above.

Recreation impacts associated with linkage to Ontario, Canada would be **potentially significant and unavoidable** related to mine methane capture offset projects, and **less-than-significant** related to ODS and landfill offset projects.

16. Transportation and Traffic

Linkage with Ontario, Canada would allow for allowances and offsets to be traded between Canada and California markets. As described in the 2010 FED for California's Cap-and-Trade Regulation, the covered entity compliance responses of upgrading equipment, decarbonization, and implementing process change would result in less-than-significant transportation and traffic impacts (ARB 2010a). The covered entity compliance response of surrendering compliance instruments would result in no impacts (ARB 2010a). Thus, no mitigation for traffic and transportation systems was identified in the 2010 FED (ARB 2010a). The Proposed Project would not change how covered entities under California's Cap-and-Trade Program would comply compared with the evaluation in the 2010 FED for California's Cap-and-Trade Regulation. Thus, transportation and traffic impacts associated with covered entities would not be affected as a result of implementation of the Proposed Project and no mitigation would be necessary in California.

Implementation of the Proposed Amendments to California's Cap-and-Trade Regulation could result in entities that are covered under California's Cap-and-Trade Program seeking offset credits from mine methane capture, ODS, and landfill gas projects in Ontario, Canada. The reasonably foreseeable compliance responses associated with offset projects and covered entities activities to meet allowances in Ontario, Canada are assumed to be similar to those discussed in the 2010 FED, MMC Protocol EA (ARB 2013b), and the ISOR for ARB's Landfills Regulation (ARB 2009). Thus, the environmental analysis from these documents is summarized below and incorporated by reference as described in Section 1.H of this Draft EA.

Impact 16.A: Transportation and Traffic Impacts Related to Linkage with Ontario, Canada

The types of covered entity compliance responses anticipated to occur in Canada would be similar to activities associated with California's Cap-and-Trade Program. Thus, for the reasons described above under Section 4.C, transportation and traffic impacts would be **less-than-significant** for covered entities compliance responses associated with linkage with Ontario, Canada.

As described in the 2010 FED for California's Cap-and-Trade Regulation, implementation of the ODS Protocol would result in less-than-significant impacts to transportation and traffic (ARB 2010a). The ISOR for ARB's Landfills Regulation did not identify any potential impacts for transportation and traffic (ARB, 2009). Implementation of MMC projects would result in less-than-significant impacts on transportation and traffic (ARB 2013b). The types of actions that would occur from linkage with Ontario, Canada through the California Cap-and-Trade Regulation would be similar to those described above.

Transportation and traffic impacts associated with linkage to Ontario, Canada would be **less-than-significant** related to ODS, landfill, and mine methane capture offset projects.

17. Utilities and Service Systems

Linkage with Ontario, Canada would allow for allowances and offsets to be traded between Canada and California markets. As described in the 2010 FED for California's Cap-and-Trade Regulation, the covered entity compliance responses of upgrading equipment, decarbonization, and implementing process change would result in less-than-significant utilities and service systems impacts (ARB 2010a). The covered entity compliance response of surrendering compliance instruments would result in no impacts (ARB 2010a). Thus, no mitigation for utilities and service systems was identified in the 2010 FED (ARB 2010a). The Proposed Project would not change how covered entities under California's Cap-and-Trade Program would comply compared with the evaluation in the 2010 FED for California's Cap-and-Trade Regulation. Thus, utilities and service systems impacts associated with covered entities would not be affected as a result of implementation of the Proposed Project and no mitigation would be necessary in California.

Implementation of the Proposed Amendments to California's Cap-and-Trade Regulation could result in entities that are covered under California's Cap-and-Trade Program seeking offset credits from mine methane capture, ODS, and landfill gas projects in Ontario, Canada. The reasonably foreseeable compliance responses associated with offset projects and covered entities activities to meet allowances in Ontario, Canada are assumed to be similar to those discussed in the 2010 FED, MMC Protocol EA (ARB 2013b), and the ISOR for ARB's Landfills Regulation (ARB 2009). Thus, the

environmental analysis from these documents is summarized below and incorporated by reference as described in Section 1.H of this Draft EA.

Impact 17.A: Utilities and Service Systems Impacts Related to Linkage with Ontario, Canada

The types of covered entity compliance responses anticipated to occur in Canada would be similar to activities associated with California's Cap-and-Trade Program. Thus, for the reasons described above under Section 4.C, utilities and service system impacts would be **less-than-significant** for covered entities compliance responses associated with linkage with Ontario, Canada.

As described in the 2010 FED for California's Cap-and-Trade Regulation, implementation of the ODS Protocol would result in less-than-significant impacts for utilities and service systems (e.g., impacts to wastewater services, stormwater facilities, water demand and supply, and landfill capacity) (ARB 2010a). The ISOR for ARB's Landfills Regulation did not identify any potential impacts for utilities and service systems (ARB, 2009). Increases to utility demand associated with MMC offset projects would be minimal and result in less-than-significant impacts (ARB 2013b). The types of actions that would occur from linkage with Ontario, Canada through the California Cap-and-Trade Regulation would be similar to those described above.

Utilities and service systems impacts associated with linkage to Ontario, Canada would be **less-than-significant** related to ODS, landfill, and mine methane capture offset projects**.**

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5.0 CUMULATIVE AND GROWTH-INDUCING IMPACTS

A. Introduction

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

Under the California Air Resources Board's (ARB's) certified regulatory program for implementing the California Environmental Quality Act (CEQA), substitute environmental documents are prepared in lieu of environmental impact reports (EIRs). In doing so, to be consistent with the goals and policies of CEQA, ARB follows the general guidance of CEQA in considering the potential cumulative impacts resulting from implementation of the recommended actions included in the Proposed Cap-and-Trade Regulatory Amendments and California's Compliance Plan for the Federal Clean Power Plan (Proposed Project). CEQA states that cumulative impacts should be addressed when the project's incremental contribution to the impact would be cumulatively considerable. (Cal. Code Regs., tit. 14, § 15130 (a)). "Cumulatively considerable" means the incremental effects of an individual project are significant when viewed in combination with the effects of past, current, and probable future projects" (Cal. Code Regs., tit. 14, § 15065 (a)(3)).

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

B. Approach to the Cumulative Analysis

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

Because of the broad geographic reach of the Proposed Project and the longer-term future horizon for achievement of emission reductions, the impact analyses for the resource topics in Chapter 4 are programmatic in that they address a program that spans the continental United States, Alaska, United States territories, and Canada. A

programmatic analysis contains discussions of the types of significant environmental impacts that may occur, rather than site-specific or project-specific effects, because detailed information of individual projects cannot yet be known. Recommended mitigation measures in Chapter 4 provide generally recognized methods to reduce potentially significant impacts, but do not offer details related to specific project locations, because the locations cannot be known at this time. As a result of the context of the environmental analysis, the impact conclusions and mitigation measures in the resource-oriented sections of Chapter 4 are cumulative by nature, because they describe the potential impacts associated collectively with the full range of reasonably foreseeable compliance responses.

For purposes of disclosure and broad consideration of the potential actions that address air quality, ARB has identified relevant projects that would result in related impacts. Related projects consist of the First Update to the Scoping Plan (adopted in 2014) and the 2030 Target Scoping Plan Update (currently in preparation), prepared in accordance with AB 32 (Statutes of 2006); the Low Carbon Fuel Standard (LCFS) and Alternative Diesel Fuel (ADF) Commercialization Regulations; the Renewables Portfolio Standard (RPS); the Short-Lived Climate Pollutant (SLCP) Reduction Strategy; the 2016 State Strategy for the State Implementation Plan (State SIP Strategy); and the Greenhouse Gas Emissions Standards for Crude Oil and Natural Gas Facilities (Oil and Gas Regulation). These programs are discussed in more detail below in Section 5.D.

Similar to the analysis presented in Chapter 4 of this Draft Environmental Analysis (EA), 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" (Cal. Code Regs., tit. 14, § 15130 (b)) and serves the purpose of providing "a context for considering whether the incremental effects of the project at issue are considerable" when judged "against the backdrop of the environmental effects of other projects." (*CBE v. Cal. Res. Agency* (2002) 103 Cal.App.4th 98, 119)

C. Significance Determinations and Mitigation

Implementation of the Proposed Project 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, the Draft EA recognizes the impact as significant and unavoidable. The Board will need to adopt Findings and a Statement of Overriding Considerations for any significant and unavoidable environmental effects of the Proposed Project as part of the approval process.

D. Projects Resulting in Related Effects

CEQA Guidelines (Cal. Code Regs., tit. 14, § 15000 et. seq.) state that a previously approved plan may be used in cumulative impacts analysis; the pertinent discussion of cumulative impacts contained in one or more previously certified EIR(s) may be incorporated by reference; and in certain circumstances, no further cumulative impact analysis is required for a project that is consistent with a plan that has a certified EIR (Cal. Code Regs., tit. 14, § 15130 (d)). The related plans and programs considered for cumulative impacts of the Proposed Project are: the AB 32 Scoping Plan First Update (both the first update, adopted in 2014, and the update currently in preparation to address a 2030 target); LCFS and ADF Regulations; RPS; SLCP Reduction Strategy; State SIP Strategy; and Oil and Gas Regulation. Several of these programs are proposed actions, currently undergoing environmental review, and have not yet been brought to the Board for consideration for adoption. Where a certified document is not yet available (i.e., RPS; SLCP Reduction Strategy, State SIP Strategy, Oil and Gas Regulation) the best available information, such as a draft EA, is used to describe cumulative effects. Note that the Renewable Electricity Standard (RES) is considered to have similar types of reasonably foreseeable compliance responses to the RPS, and therefore its impact analysis is considered for the purposes of this cumulative analysis. For more detail, see Section 5.D.3 below.

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 (Cal. Code Regs., tit. 14, § 15150). Therefore, the following documents are incorporated by reference.

- Final EA for the Scoping Plan First Update (ARB 2014c)
- Final EA for the LCFS/ADF Regulations (ARB 2015b)
- Final Functional Equivalent Document (FED) for the RES (ARB 2010b)
- Draft EA for the SLCP Reduction Strategy (ARB 2016a)
- Draft EA for the State SIP Strategy (ARB 2016b)
- Draft EA for the Oil and Gas Regulation (ARB 2016c)

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

1. Scoping Plan First Update

The Scoping Plan First Update EA provided a program-level review of significant adverse impacts associated with the reasonably foreseeable compliance responses for implementing the recommended actions identified in each of the nine sectors discussed in the Scoping Plan First Update. The impact discussion includes, where relevant, construction-related effects, operational effects of new or modified facilities, and

influences of the recommended actions on GHG and air pollutant emissions. The Scoping Plan First Update EA, certified by the Board in 2014, was prepared as a program environmental document for the entire statewide plan of GHG reduction projects implemented to meet the statewide GHG reduction target, including several recommendations which are also included in the State SIP Strategy. The EA is available online at http://www.arb.ca.gov/cc/scopingplan/scopingplan.htm.

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

a) Energy Sector under the Scoping Plan First Update

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

b) Transportation Sector under the Scoping Plan First Update

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

c) Agriculture Sector under the Scoping Plan First Update

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

d) Water Sector under the Scoping Plan First Update

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

e) Waste Management Sector under the Scoping Plan First Update

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

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

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

Agency, California Office of Planning and Research, California Department of Food and Agriculture, California Department of Forestry and Fire Protection, California Board of Forestry and Fire Protection, California Department of Fish and Wildlife, and ARB to develop land use programs. These programs generally aim to increase urban forest canopy cover and limit the conversion of croplands, forests, rangeland, and wetlands to urban uses. In addition, increased use of green infrastructure was evaluated, such as vegetation and soils to manage stormwater runoff, rainwater harvesting, bioswales, permeable pavement, and green (e.g., growing media and vegetation) roofs. In addition to land use planning efforts, reasonably foreseeable compliance responses included incentives to encourage the use of urban, agricultural, and forest wastes to produce electricity and transportation fuels, which could be accomplished through increased use of biomass facilities.

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

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

h) Green Buildings Sector under the Scoping Plan First Update

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

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

Under the Scoping Plan First Update, the Cap-and-Trade Regulation was considered to be a vital component for achieving California's longer-term emission-reduction goals.

The Cap-and-Trade Regulation creates a gradually declining limit on the sources responsible for 85 percent of California's GHG emissions, establishes the price signal needed to drive long-term investment in cleaner fuels and more efficient use of energy, and affords covered entities the flexibility to seek out and implement the lowest-cost options to reduce emissions. The Cap-and-Trade Regulation places an aggregated emissions cap on the total emissions generated by all covered facilities in the program. Over time, the cap will steadily decline. Reasonably foreseeable compliance responses evaluated under the Scoping Plan First Update include implementation of additional offset protocols adopted under the existing Cap-and-Trade Regulation's provision allowing for offset protocols (ARB has already adopted offset protocols for U.S. Forest Projects, Urban Forest Projects, Livestock Projects ODS Projects, Mine Methane Capture Projects and Rice Cultivation Projects). In addition, compliance responses related to covered entities under the Cap-and-Trade Regulation consist of upgrading equipment, switching to lower intensity carbon fuels, and implementing maintenance and process changes at existing facilities.

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

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

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

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

	Energy Sector	Transportation Sector	Agriculture Sector	Water Sector	Waste Management Sector	Natural and Working Lands Sector	Short-Lived Climate Pollutants Sector	Green Buildings	Cap-and-Trade Regulation
Long-Term Operational Impacts	LTS	PSU	B	LTS	LTS/ SU[1]	PSU	LTS	B	
Biological Resources									
Short-Term Construction Impacts	PSU	PSU	LTS	PSU	PSU	PSU	PSU	PSU	PSU
Long-Term Operational Impacts	PSU	PSU	B	PSU	PSU	LTS	PSU	PSU	
Cultural Resources									
Short-Term Construction Impacts	PSU	PSU	LTS	PSU	PSU	PSU	PSU	PSU	PSU
Long-Term Operational Impacts	NA	NA	NA	NA	NA	NA	NA	NA	
Energy Demand									
Short-Term Construction Impacts	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	B
Long-Term Operational Impacts	B	B	B	LTS	B	B	LTS	B	
Geology and Soils									
Short-Term Construction Impacts	PSU	PSU	LTS	PSU	PSU	PSU	PSU	PSU	PSU
Long-Term Operational Impacts	PSU	PSU	LTS	PSU	PSU	PSU	PSU	PSU	
Greenhouse Gas									
Short-Term Construction Impacts	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS
Long-Term Operational Impacts	B	B	B	B	B	LTS	B	B	B
Hazards and Hazardous Materials									
Short-Term	PSU	PSU	LTS	PSU	PSU	PSU	PSU	PSU	LTS

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

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

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

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

Notes: B = beneficial, LTS = less-than-significant, NA = not applicable, PSU = Potentially significant and unavoidable after mitigation.
[1]Long-term operational impacts were identified as LTS, but odor-related impacts were identified as significant and unavoidable in the Waste Management sector.
[2] Impacts related to the Cap-and-Trade regulation include the effects associated with offset protocols adopted after the adoption of the Cap-and-Trade regulation

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

known at this time, except as they relate to continuation of programs from the first update.

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

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

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

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

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

Resource Area Impact Significance Before Mitigation	Significance Conclusion
Aesthetics	
Impact 1.a: Short-Term Construction-Related and Long-Term Operational Impacts on Aesthetics	PSU
Agriculture Resources	
Impact 2.a: Conversion of Agricultural and Forest Resources Related to New Facilities	PSU
Impact 2.b: Agricultural and Forest Resource Impacts Related to Feedstock Cultivation	PSU
Air Quality	
Impact 3.a: Short-Term Construction-Related Air Quality Impacts	PSU
Impact 3.b: Long-Term Operational Air Quality Emissions	B
Impact 3.c: Short-Term Construction-Related and Long-Term Operational Impacts from Odors	LTS
Biological Resources	
Impact 4.a: Short-Term Construction-Related and Long-Term Impacts on Biological Resources Related to New Facilities	PSU
Impact 4.b: Effects of Biological Resources Associated with Land Use Changes	PSU
Cultural Resources	
Impact 5.a: Short-Term Construction-Related Impacts on Cultural Resources	PSU
Energy Demand	
Impact 6.a: Short Term Construction-Related Impacts on Energy Demand	LTS
Impact 6.b: Long-Term Operational Impacts on Energy Demand	B
Geology, Soils and Minerals	
Impacts 7.a: Short-Term Construction-Related and Long-Term Operational Effects on Geology and Soil Related to New Facilities	PSU
Impact 7.b: Long-Term Operational Impacts Associated with Carbon Capture and Sequestration Projects	PSU
Impact 7.c: Long-Term Operational Impacts to Geology and Soil Associated with Land Use Changes	PSU
Greenhouse Gas Emissions	
Impact 8.a: Short-Term Construction- and Long-term Operational Related Greenhouse Gas Impacts	B

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

Resource Area Impact Significance Before Mitigation	Significance Conclusion
Hazards and Hazardous Materials	
Impact 9.a: Short-Term Construction-Related Hazard Impacts	PSU
Impact 9.b: Long-Term Increased Transport, Use, and Disposal of Hazardous Materials	LTS
Impact 9.c: Long-Term Operational Hazards Related to Carbon Capture and Sequestration	PSU
Hydrology and Water Quality	
Impact 10.a: Short-Term Construction-Related and Long-Term Operational Hydrologic Resource Impacts	PSU
Impact 10.b: Long-Term Effects on Hydrology and Water Quality Related to Changes in Land Use	PSU
Impact 10.c: Long-Term Impacts on Hydrology and Water Quality Related to Carbon Capture and Sequestration Projects	PSU
Land Use and Planning	
Impact 11.a: Short-Term Construction-Related Impacts Related to New or Modified Facilities	PSU
Impact 11.b: Long-Term Operational Impacts Related to Feedstock Production	PSU
Mineral Resources	
Impact 12.a: Short-Term Construction-Related Impacts and Long-Term Operational Impacts on Mineral Resources	LTS
Noise	
Impact 13.a: Short-Term Construction-Related Noise Impacts	PSU
Impact 13.b: Long-Term Operational Noise Impacts	LTS
Population and Housing	
Impact 14.a: Short-Term Construction-Related Impacts and Long-Term Operational Impacts on Population, Employment, and Housing	LTS
Public Services	
Impact 15.a: Short-Term Construction-Related Impacts and Long-Term Operational Impacts on Public Services	LTS
Recreation	
Impact 16.a: Short-Term Construction-Related Impacts and Long-Term Operational Impacts on Recreation	LTS
Transportation and Traffic	
Impact 17.a: Short-Term Construction-Related Impacts on Traffic and Transportation	PSU
Impact 17.b: Long-Term Operational Impacts on Traffic and Transportation	PSU

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

Resource Area Impact Significance Before Mitigation	Significance Conclusion
Utilities and Service Systems	
Impact 18.a: Increased Demand for Water, Wastewater, Electricity, and Gas Services	PSU
Notes: B=beneficial impact, LTS=less-than-significant impact, PSU=potentially significant and unavoidable impact, LCFS/ADF=Low Carbon Fuel Standard/Alternative Diesel Fuels, EA=Environmental Analysis The conclusion, potentially significant and unavoidable, indicates that mitigation measures have been recommended; however, the authority to determine project-level impacts and require project-level mitigation lies with other land use and/or permitting agencies for individual projects. There is inherent uncertainty in the degree of mitigation that may ultimately be implemented by other agencies to reduce potentially significant impacts and they are, therefore, considered to be potentially significant and unavoidable.	

3. Renewable Electricity Standard and Renewables Portfolio Standard

Established in 2002 under Senate Bill 1078, California's Renewables Portfolio Standard (RPS) was accelerated in 2006 under Senate Bill 107 by requiring that 20 percent of electricity retail sales be served by renewable energy resources by 2010. Subsequent recommendations in California energy policy reports advocated a goal of 33 percent by 2020, and on November 17, 2008, Governor Arnold Schwarzenegger signed Executive Order S-14-08 requiring that "…[a]ll retail sellers of electricity shall serve 33 percent of their load with renewable energy by 2020." Senate Bill X1-2 was signed by Governor Edmund G. Brown, Jr., in April 2011 setting the RPS target at 33 percent by 2020. This new RPS applied to all electricity retailers in the state including publicly owned utilities, investor-owned utilities, electricity service providers, and community choice aggregators. All of these entities were required to adopt the new RPS goals of 20 percent of retails sales from renewables by the end of 2013, 25 percent by the end of 2016, and the 33 percent requirement being met by the end of 2020.

ARB prepared draft regulatory language and a draft functional equivalent document (FED) for the RES. The RES was intended to be patterned after the existing Renewables Portfolio Standard (RPS), currently administered by the California Public Utilities Commission (CPUC) and the California Energy Commission (CEC), which called for the achievement of 20 percent of total electricity sales from eligible energy resources by the end of 2010. Because the RPS required electric corporations to increase procurement from eligible renewable energy resources with the goal of achieving 20 percent of the total from those sources, the RES was essentially an extension of that program that set a higher renewable electricity goal and was intended

to apply to all load-serving entities. For the purposes of this analysis, the RES FED is relied upon to consider the environmental effects of the RPS.

ARB staff, working closely with the California Public Utilities Commission, California Energy Commission, and the California Independent System Operator, developed the RES regulation. The Board adopted the RES regulation on September 23, 2010, but has not completed the final approval stages. However, this regulation did not go into effect because of subsequent legislation (SB X1-2, Simitian, statutes of 2011) signed by Governor Brown in April 2011, which codified the 33 percent renewables requirement by 2020. SB X1-2 applies to all electricity retailers in the state including publicly owned utilities, investor-owned utilities, electricity service providers, and community choice aggregators. All of these entities must meet renewable energy goals of 20 percent of retail sales from renewables by the end of 2013, 25 percent by the end of 2016, and 33 percent by the end of 2020.

The FED for the RES regulation analyzed additional compliance responses related to increase use of wind, solar thermal, solar photovoltaic, geothermal, solid-fuel biomass, biogas, and small hydroelectric to generate electricity. In addition, the analysis also considered new and upgraded transmission lines to move the electricity from the source of generation to substations near population centers. Environmental impacts associated with implementation of the RES regulation, as presented in the FED, are shown in Table 5-3.

Table 5-3
Summary of RES Environmental Impacts and Mitigation Measures

Impact	Significance After Mitigation
Aesthetics	
Impact A-1: Adverse Effects on Scenic Vistas, Scenic Resources, and Visual Character	PSU
Impact A-2: Adverse Effects of Light and Glare	PSU
Air Quality	
Impact B-1: Short-Term Construction Impacts to Air Quality from Out-of-State Project-Generated Emissions of Criteria Air Pollutants and Precursors	PSU
Impact B-2: Long-Term Operational Impacts to Air Quality from Out-of-State Project-Generated Emissions of Criteria Air Pollutants and Precursors	PSU
Impact B-3: Impacts to Sensitive Receptors in the Project Area from Exposure to Substantial Pollutant Emissions (e.g., localized criteria air pollutants, toxic air contaminates) and Odors	LTS

Table 5-3
Summary of RES Environmental Impacts and Mitigation Measures

Impact	Significance After Mitigation
Biological and Forestry Resources	
Impact C-1: Loss of special-status species	PSU
Impact C-2: Removal, Degradation, and Fragmentation of Sensitive Habitats	PSU
Impact C-3: Loss and Fragmentation of Wildlife Habitat or Plant Community	PSU
Impact C-4: Interference with Wildlife Movement	PSU
Impact C-5: Conflict with adopted HCPs, NCCPs, other conservation plans or other policies to protect natural resources	PSU
Impact C-6: Loss or conversion of forest land	PSU
Cultural Resources	
Impact D-1: Adverse Impacts to Cultural Resources from Ground Disturbance	PSU
Impact E-1: Seismic Hazard Impacts Related Fault Rupture, Ground Shaking, Ground Failure/Liquefaction or Landslides	PSU
Impact E-2: Substantial soil erosion or the loss of topsoil	PSU
Impact E-3: Unstable Geologic Unit or Soil Impacts	PSU
Impact E-4: Adverse Impacts from Construction on Expansive Soil	PSU
Impact E-5: Adverse Soils Impacts from Septic Tanks or Alternative Waste Water Disposal Systems	PSU
Impact E-6: Loss of Mineral Resource of Value to Region and the Residents of the State and Loss of Locally Important Mineral Resources	PSU
Hazards and Hazardous Materials	
Impact G-1: Routine transport, use or disposal of hazardous materials	LTS
Impact G-2: Upset and accident conditions involving the release of hazardous materials into the environment	PSU
Impact G-3: Hazardous emission release within one quarter mile of a school	LTS
Impact G-4: Location within an area that is included on a hazardous materials list compiled pursuant to Government Code Section 65962.5	LTS

Table 5-3
Summary of RES Environmental Impacts and Mitigation Measures

Impact	Significance After Mitigation
Impact G-5: Hazards associated with proximity to a public or private airport or location within an Airport Land Use Plan	LTS
Impact G-6: Conflicts with an adopted emergency response plan	LTS
Impact G-7: Wildland fire risk	LTS
Hydrology, Water Quality, and Water Supply	
Impact H-1: Potential Operations-Related Effects to Groundwater Hydrology and Water Supply	PSU
Impact H-2: Potential Construction- and Operations-Related Effects to Stormwater Drainage and Flooding Hazards	PSU
Impact H-3: Temporary Construction-Related Water Quality Effects	PSU
Impact H-4: Long-term Operations-Related Effects to Surface and Groundwater Quality	PSU
Land Use Planning and Agricultural Resources	
Impact I-1: Physically divide an existing community	PSU
Impact I-2: Conflict with Land Use Plans, Policies or Regulations	PSU
Impact I-3: Conflict with applicable Habitat Conservation Plan or Natural Communities Conservation Plan	PSU
Impact I-5: Conversion of Designated Farmland	PSU
Impact I-5: Conflict with Existing Agricultural Zoning or Williamson Act Contract	PSU
Noise	
Impact J-1: Impacts to Sensitive Receptors from Project-Generated Short-Term Construction and Long-Term Operational Noise (and Vibration) Levels	PSU
Impact J-2: Impacts to People Residing or Working in the Project Area from Exposure to Excessive Airport-Related Noise Levels	PSU
Recreation	
Impact K-1: Impact to Recreation Resources, Opportunities, or Uses	PSU
Public Services, Utilities, and Solid Waste	
Impact L-1: Impacts to Public Services, Utilities, and Solid Waste Services	PSU

Table 5-3
Summary of RES Environmental Impacts and Mitigation Measures

Impact	Significance After Mitigation
Impact L-2: Water Supply Impacts	PSU
Impact L-3: Exceed Wastewater Treatment Requirements	LTS
Impact L-4: Violate Solid Waste Regulations	LTS
Transportation and Traffic	
Impact M-1: Project-Generated Short-Term Construction and Long-Term Operational Impacts to Transportation and Traffic	PSU
Notes: LTS = less-than-significant, PSU = significant and unavoidable * While impacts could be reduced to a less-than-significant level, ARB does not have the authority to implement mitigation measures.	

In October 2015, Governor Brown signed into law Senate Bill 350, which requires retail sellers and publicly owned utilities to procure 50 percent of their electricity from eligible renewable energy resources by 2030. The types of projects that would be implemented as reasonably foreseeable compliance responses to reach this updated goal would be the same those described in the RES FED.

4. Short-Lived Climate Pollutant Reduction Strategy

Under SB 605, Statutes of 2014, the development of the SLCP Reduction Strategy included coordination with local and State agencies, academic experts, businesses, organizations, and other stakeholders. Through mandatory and voluntary measures, incentives, and other policies and plans, the Proposed Strategy aims to identify a statewide strategy to encourage reductions in emissions of black carbon, methane, and hydrofluorocarbons (HFCs) in the State.

ARB released the draft SLCP Reduction Strategy and Draft EA for public review on April 11, 2016. During the public review period a workshop was held on April 26, 2016 and a Board meeting was held on May 19, 2016. ARB is currently in the process of preparing written responses to comments received on the Draft EA and making revisions, as necessary. A Final EA and the written responses to the environmental comments will be presented to the Board at a public hearing that will be held in the early fall of 2016, when the Board will consider approval of the SLCP Reduction Strategy. While this strategy is not yet approved it is considered to be a reasonably foreseeable future project related to the Proposed Project.

The reasonably foreseeable compliance responses associated with the SLCP Reduction Strategy consisted of measures to reduce black carbon, methane, and HFCs, as described below.

Black Carbon

Reasonably foreseeable compliance responses that could result from implementation of black carbon reduction measures include increased installation of gas fireplaces and U.S. Environmental Protection Agency (U.S. EPA)- certified devices and a substantial increase in forest management practices (e.g., prescribed fire, forest and under growth thinning, harvesting, or clearance, access road and debris storage site development). Implementation of these measures may result in construction of new and/or expansion of facilities to produce new fireplaces, and the development of new (or expansion of existing) wood product processing and biomass facilities to manage increased volumes of biomass feedstock. These actions may include the production of exportable electricity generation and the use of heavy forest harvesting, processing, and transport equipment.

Methane

Reasonably foreseeable compliance responses that could result from implementation of the methane reduction measures under the SLCP Reduction Strategy could include: changes to manure management systems and practices at dairies (e.g., installing scrape manure systems or using equipment such as manure vacuums, digesters, storage silos and tanks, and facilities to support pasturing of cattle), the development of organic material composting and/or digesting facilities that would convert organic wastes diverted from landfills (e.g., yard waste, green wastes, food) into composted materials and/or biogas, development of new, or modification of existing, wastewater treatment plants to operate anaerobic digesters that would be equipped for co-digestion with solid wastes to produce biogas (which may include electricity generator sets, biogas storage tanks and compression and cleaning equipment, above ground pipeline systems, transmission poles and wires, and vehicle fueling stations), and the collection and reduction of methane emissions from oil and gas facilities (which may include modifications to existing facilities, pipeline replacement or reconstruction activities, inspection and monitoring, and disposal of methane vapors).

Hydrofluorocarbons

The SLCP Reduction Strategy contains actions to reduce HFC emissions within the State. These strategies could require replacing high-global warming potential (GWP) HFCs, used as refrigerants foam expansion agents, aerosol propellants, and to a lesser extent, as solvents and fire suppressants, with low-GWP compounds such as ammonia, carbon dioxide (CO_2), hydrocarbons, lower-GWP HFCs, and hydrofluoro-olefins (HFOs). These replacements could result in minor to moderate modifications to existing facilities. The low-GWP replacements considered in the Proposed Strategy are already being conducted on a large scale within the United States or internationally with the exception of HFOs. A reasonably foreseeable compliance response to implementation of the HFC reduction measures would be the construction of new HFO manufacturing facilities.

Environmental impacts associated with the Short-Lived Climate Pollutant Reduction Strategy were evaluated in a draft EA prepared by ARB. Impacts associated with implementation of this strategy are summarized below in Table 5-4.

Table 5-4
Summary of Impacts by Reduction Measures for the Short-Lived Climate Pollutant Reduction Strategy

	Black Carbon	Methane	HFCs
Aesthetics			
Short-Term Construction-Related Impacts	PSU	PSU	PSU
Long-Term Operational-Related Impacts	PSU	PSU	
Agriculture & Forest Resources			
Short-Term Construction-Related Impacts	PSU	PSU	PSU
Long-Term Operational-Related Impacts			
Air Quality			
Short-Term Construction-Related Impacts	PSU	PSU	PSU
Long-Term Operational-Related Impacts	PSU	PSU	LTS
Short-Term and Long-Term Odor Impacts	LTS	PSU	LTS
Biological Resources			
Short-Term Construction-Related Impacts	PSU	PSU	PSU
Long-Term Operational-Related Impacts	PSU		LTS
Cultural Resources			
Short-Term Construction-Related Impacts	PSU	PSU	PSU
Long-Term Operational-Related Impacts	PSU	NA	NA
Energy Demand			
Short-Term Construction-Related Impacts	LTS	LTS	LTS
Long-Term Operational-Related Impacts	LTS	LTS	
Geology and Soils			
Short-Term Construction-Related Impacts	PSU	PSU	PSU
Long-Term Operational-Related Impacts	PSU	LTS	LTS
Greenhouse Gas			
Short-Term Construction-Related Impacts	LTS	LTS	LTS
Long-Term Operational-Related Impacts	B	B	B
Hazards & Hazardous Materials			
Short-Term Construction-Related Impacts	PSU	PSU	PSU
Long-Term Operational-Related Impacts	PSU	LTS	LTS
Hydrology and Water Quality			
Short-Term Construction-Related Impacts	PSU	PSU	PSU
Long-Term Operational-Related Impacts	PSU	LTS	LTS

Table 5-4
Summary of Impacts by Reduction Measures for the Short-Lived Climate Pollutant Reduction Strategy

	Black Carbon	Methane	HFCs
Land Use Planning			
Short-Term Construction-Related Impacts	May not be consistent	May not be consistent	May not be consistent
Long-Term Operational-Related Impacts			
Mineral Resources			
Short-Term Construction-Related Impacts	LTS	LTS	LTS
Long-Term Operational-Related Impacts			
Noise			
Short-Term Construction-Related Impacts	PSU	PSU	PSU
Long-Term Operational-Related Impacts	PSU	LTS	LTS
Population and Housing			
Short-Term Construction-Related Impacts	LTS	LTS	LTS
Long-Term Operational-Related Impacts			
Public Services			
Short-Term Construction-Related Impacts	LTS	LTS	LTS
Long-Term Operational-Related Impacts			
Recreation			
Short-Term Construction-Related Impacts	LTS	LTS	LTS
Long-Term Operational-Related Impacts			
Transportation/Traffic			
Short-Term Construction-Related Impacts	PSU	PSU	PSU
Long-Term Operational-Related Impacts	PSU	PSU	PSU
Utilities and Service Systems			
Short-Term Construction-Related Impacts	NA	NA	NA
Long-Term Operational-Related Impacts	PSU	PSU	PSU
Notes: B = beneficial, LTS = less-than-significant, HFCs=hydrofluorocarbons, NA = not applicable, PSU = potentially significant and unavoidable after mitigation; "may not be consistent" refers to the effects a project may have on zoning and other land use planning considerations.			

5. State SIP Strategy

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

Developing the SIPs is an immediate focus of ARB's planning efforts, with regional plans for ozone nonattainment areas due in July 2016 and $PM_{2.5}$ nonattainment areas in October 2016. Substantial emission reductions beyond those being achieved with current programs are needed to meet these standards. In addition to the most recent air quality standards, the South Coast and San Joaquin Valley must also continue to progress towards attaining earlier standards they have not yet achieved, including the 8-hour ozone standard of 80 ppb, and the 24-hour $PM_{2.5}$ standard of 35 µg/m³.

ARB released the draft State SIP Strategy and Draft EA for public review on May 17, 2016. The public comment period for the draft State SIP Strategy and Draft EA is from May 17, 2016 through July 18, 2016. ARB will prepare written responses to comments received on the Draft EA and make revisions as necessary. A Final EA and the written responses to the environmental comments will be presented to the Board at the September 22-23, 2016 Board meeting, when the Board will consider approval of the State SIP Strategy. While the State SIP Strategy is not yet approved, it is considered to be a reasonably foreseeable future project related to the Proposed Project.

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

Potential environmental impacts associated with the State SIP Strategy are summarized below in Table 5-5.

Table 5-5
Summary of Environmental Impacts and Mitigation Measures for the State SIP Strategy

Resource Area Impact Significance Before Mitigation	Significance After Mitigation
Aesthetics	
Impact 1-1: Short-Term Construction-Related and Long-Term Operational Impacts on Aesthetics	PSU
Agriculture Resources	
Impact 2-1: Short-Term Construction-Related and Long-Term Operational-Related Effects to Agricultural and Forest Resources	PSU
Air Quality	
Impact 3-1: Short-Term Construction-Related Effects to Air Quality	PSU
Impact 3-2: Long-Term Operational-Related Effects to Air Quality	B
Biological Resources	
Impact 4-1: Short-Term Construction-Related Effects to Biological Resources	PSU
Impact 4-2 Long-Term Operational-Related Effects to Biological Resources	PSU
Cultural Resources	
Impact 5-1: Short-Term Construction-Related and Long-Term Operational Effects to Cultural Resources	PSU
Energy Demand	
Impact 6-1: Short Term Construction-Related Impacts on Energy Demand	LTS
Impact 6-2: Long-Term Operational Impacts on Energy Demand	B
Geology, Soils and Minerals	
Impact 7-1: Short-Term Construction-Related and Long-Term Operational Effects on Geology, Seismicity, and Soils	PSU
Greenhouse Gas Emissions	
Impact 8-1: Short-Term Construction-Related and Long-Term Operational Greenhouse Gas Impacts	B
Hazards and Hazardous Materials	
Impact 9-1: Short-Term Construction-Related Hazard Impacts	PSU
Impact 9-2: Long-Term Increased Transport, Use, and Disposal of Hazardous Materials	LTS
Hydrology and Water Quality	
Impact 10-1: Short-Term Construction-Related Hydrologic Resource Impacts	PSU
Impact 10-2: Long-Term Effects on Hydrology and Water Quality Related to Changes in Land Use	PSU

Table 5-5
Summary of Environmental Impacts and Mitigation Measures for the State SIP Strategy

Resource Area Impact Significance Before Mitigation	Significance After Mitigation
Land Use and Planning	
Short-Term Construction-Related and Long-Term Operational Impacts on Land Use and Planning	LTS
Mineral Resources	
Impact 12-1: Short-Term Construction-Related Impacts on Mineral Resource	LTS
Impact 12-2: Long-Term Operational Impacts on Mineral Resources	LTS
Noise	
Impact 13-1 Short-Term Construction-Related Noise Impacts	PSU
Impact 13-2: Long-Term Operational Noise Impacts	PSU
Impact 14-1: Short-Term Construction-Related and Long-Term Operational-Related Effects to Population and Housing	LTS
Impact 15-1: Short-Term Construction-Related and Long-Term Operational-Related Effects to Public Services	LTS
Impact 16-1: Short-Term Construction-Related and Long-Term Operational-Related Effects to Recreation	LTS
Transportation and Traffic	
Impact 17-1: Short-Term Construction-Related Impacts on Traffic and Transportation	PSU
Impact 17-2: Long-Term Operational Impacts on Traffic and Transportation	PSU
Utilities and Service Systems	
Impact 18-1: Short-Term Construction Related and Long-Term Operational Impacts on Utilities and Service Systems	PSU
Notes: B = beneficial, LTS = less-than-significant, PSU = potentially significant and unavoidable after mitigation	

6. Greenhouse Gas Emission Standards for Crude Oil & Natural Gas Facilities

The Scoping Plan First Update included the Oil and Gas Regulation as part of the Energy Sector as a method to reduce GHG emissions in the State. The Proposed Regulation contains measures that would reduce the amount of methane emitted during oil and gas production, processing, storage, and transmission compressor stations, by requiring regulated entities to take actions to limit vented and fugitive methane emissions from equipment and operations. The components of the Proposed Regulation are as follows and described in greater detail below.

ARB released the draft Oil and Gas Regulation and Draft EA on May 31, 2016. Several public workshops were held from mid-2014 with the most recent workshop held on February 4, 2016. The 45-day public comment period for the draft Oil and Gas Regulation and Draft EA is from June 3, 2016 through July 18, 2016. The Oil and Gas Regulation was presented to the Board at a Board hearing held on July 21, 2016. ARB will prepare written responses to comments received on the Draft EA and make revisions, as necessary. A Final EA and the written responses to the environmental comments will be presented to the Board at a public hearing that will be held in spring 2017, when the Board will consider for approval the Oil and Gas Regulation. While this regulation is not yet approved it is considered to be a reasonably foreseeable future project related to the Proposed Project.

Reasonably foreseeable compliance responses associated with the Oil and Gas Regulation would include modifications to existing facilities, such as vapor collection systems, and replacement or repair of leaking equipment. Compliance responses associated with the Proposed Regulation would result in installation or replacement of gathering lines and piping, flanges, valves, low-NOx combustion devices, tanks, pneumatic devices and pumps, and other similar features already associated with oil and gas facilities.

Potential environmental impacts associated with the Oil and Gas Regulation are summarized below in Table 5-6.

Table 5-6
Summary of Environmental Impacts and Mitigation Measures for the Oil and Gas Regulation

Resource Area Impact Significance Before Mitigation	Significance After Mitigation
Aesthetics	
Impact 1.a: Short-Term Construction-Related Impacts on Aesthetics. Less than significant	LTS
Impact 1.b: Long-Term Operational Impacts on Aesthetics Less than significant	LTS
Agriculture Resources	
Impact 2.a: Short-Term Construction-Related and Long-Term Operational Impacts on Agricultural and Forest Resources Less than significant	LTS
Air Quality	
Impact 3.a: Short-Term Construction-Related Impacts on Air Quality	LTS
Impact 3.b: Long-Term Operational Impacts on Air Quality	LTS

Table 5-6
Summary of Environmental Impacts and Mitigation Measures for the Oil and Gas Regulation

Resource Area Impact Significance Before Mitigation	Significance After Mitigation
Biological Resources	
Impact 4.a: Short-term Construction-Related Impacts on Biological Resources	PSU
Impact 4.b: Long-term Operational Impacts on Biological Resources	LTS
Cultural Resources	
Impact 5.a: Short-Term Construction-Related Impacts on Cultural Resources and Paleontological Resources **potentially significant**	PSU
Energy Demand	
Impact 6.a: Short-Term Construction-Related Impacts on Energy Demand	LTS
Impact 6.b: Long-Term Operational Impacts on Energy Demand	LTS
Geology, Soils and Minerals	
Impact 7.a: Short-Term Construction-Related Impacts on Geology and Soils	PSU
Impact 7.b: Long-Term Operational Impacts on Geology and Soils	LTS
Greenhouse Gas Emissions	
Impact 8.a: Short-Term Construction-Related Impacts on Greenhouse Gases	LTS
Impact 8.b: Long-Term Operational Impacts on Greenhouse Gases	B
Hazards and Hazardous Materials	
Impact 9.a: Short-Term Construction-Related Impacts on Hazards and Hazardous Materials	LTS
Impact 9.b: Long-Term Operational Impacts on Hazards and Hazardous Materials	LTS
Hydrology and Water Quality	
Impact 10.a: Short-Term Construction-Related Impacts on Hydrology and Water Quality	PSU
Impact 10.b: Long-Term Operational Impacts on Hydrology and Water Quality	LTS
Land Use and Planning	
Impact 11: Short-Term Construction-Related and Long-Term Operational Impacts on Land Use and Planning	LTS

Table 5-6
Summary of Environmental Impacts and Mitigation Measures for the Oil and Gas Regulation

Resource Area Impact Significance Before Mitigation	Significance After Mitigation
Mineral Resources	
Impact 12: Short-Term Construction-Related and Long-Term Operational Impacts on Mineral Resources	LTS
Noise	
Impact 13.a: Short-Term Construction-Related Impacts on Noise	LTS
Impact 13.b: Long-Term Operational Impacts on Noise	LTS
Population and Housing	
Impact 14: Short-Term Construction-Related and Long-Term Operational Impacts on Population and Housing	LTS
Public Services	
Impact 15: Short-Term Construction-Related and Long-Term Operational Impacts on Public Services	LTS
Recreation	
Impact 16: Short-Term Construction-Related and Long-Term Operational Impacts on Recreation	LTS
Transportation and Traffic	
Impact 17.a: Short-Term Construction-Related Impacts of Transportation and Traffic	LTS
Impact 17.b: Long-Term Operational Impacts on Transportation and Traffic	LTS
Utilities and Service Systems	
Impact 18: Long-Term Operational Impacts on Utilities and Service Systems	LTS
Notes: B = beneficial, LTS = less-than-significant, PSU = potentially significant and unavoidable after mitigation	

E. Cumulative Impacts

1. Aesthetics

Table 5-7
Summary of Aesthetic Impacts under Related Projects and Proposed Project

	Scoping Plan First Update [1]	LCFS/ADF Regulation	RES [2]	SLCP	State SIP Strategy	Oil and Gas	CPP/C&T
Significance Conclusion	PSU	PSU	PSU	PSU	PSU	LTS	PSU

Notes: LCFS/ADF=Low Carbon Fuel Standard/Alternative Diesel Fuels; RES=Renewable Electricity Standard; SLCP=Short-Lived Compliant Pollutant; SIP=State Implementation Plan; CPP/C&T=Clean Power Plan/Cap and Trade Regulation; LTS=less-than-significant; PSU=potentially significant and unavoidable. [1] Significance conclusions under the Scoping Plan First Update column indicate the greatest level of impacts (e.g., potentially significant and unavoidable) reported under the nine sectors, see Table 5-1 for more detailed information. [2] RES (as adopted by the Board) is not being implemented, rather the RES impacts are considered similar to impacts of the RPS standard codified by legislation.

Impacts to aesthetic resources associated with extension of the cap beyond 2020, extension of allowance allocation beyond 2020, incorporation of results of leakage studies for post-2020 industrial allocation, and compliance with CPP would be less-than-significant. Linkage to Ontario, Canada could result in adverse aesthetic impacts associated with implementation of mine methane capture offset projects; and less-than-significant related compliance responses by covered entities, and ODS and landfill offset projects.

Implementation of the Scoping Plan First Update, LCFS/ADF regulations, RPS (as evaluated in the RES FED), SLCP, State SIP Strategy, and Oil and Gas Regulation would include the reasonably foreseeable compliance responses described above under Section 5.D. As summarized in Table 5-7, the Scoping Plan First Update, LCFS/ADF regulations, RPS (as evaluated in the RES FED), SLCP, and State SIP Strategy environmental documents identified potentially significant and unavoidable impacts on aesthetics due to construction and operation of individual projects. Thus, implementation of these programs could result in a significant cumulative effect.

The Proposed Project's contribution to this significant impact would be cumulatively considerable due to potential aesthetics impacts associated with implementation of mine methane capture offset projects related to linkage with Ontario, Canada. While compliance with relevant and applicable laws and regulations would reduce impacts in the United States, it is unknown where and under which jurisdiction individual projects may be located in Canada as a result of linkage with Ontario, Canada. As a result, aesthetic impacts may be substantial. Thus the Proposed Project could result in a

cumulatively considerable contribution to a significant cumulative impact on aesthetic resources.

2. Agricultural and Forest Resources

Table 5-8
Summary of Agricultural and Forest Resources Impacts under Related Projects and Proposed Project

	Scoping Plan First Update [1]	LCFS/ADF Regulation	RES [2]	SLCP	State SIP Strategy	Oil and Gas	CPP/C&T
Significance Conclusion	PSU	PSU	PSU	PSU	PSU	LTS	PSU

Notes: LCFS/ADF=Low Carbon Fuel Standard/Alternative Diesel Fuels; RES=Renewable Electricity Standard; SLCP=Short-Lived Compliant Pollutant; SIP=State Implementation Plan; CPP/C&T=Clean Power Plan/Cap and Trade Regulation; LTS=less-than-significant; PSU=potentially significant and unavoidable. [1] Significance conclusions under the Scoping Plan First Update column indicate the greatest level of impacts (e.g., potentially significant and unavoidable) reported under the nine sectors, see Table 5-1 for more detailed information. [2] RES (as adopted by the Board) is not being implemented, rather the RES impacts are considered similar to impacts of the RPS standard codified by legislation.

Impacts to agricultural and forest resources associated with extension of the cap beyond 2020, extension of allowance allocation beyond 2020, incorporation of results of leakage studies for post-2020 industrial allocation, and compliance with CPP would be less-than-significant. Implementation of offset projects associated with California's Cap-and-Trade Program would result in less-than-significant impacts on agriculture and forest resources. Linkage to Ontario, Canada could result in significant adverse agricultural and forest resources impacts associated with implementation of mine methane capture offset projects; and less-than-significant related to compliance responses by covered entities, and ODS and landfill offset projects.

Implementation of the Scoping Plan First Update, LCFS/ADF regulations, RPS (as evaluated in the RES FED), SLCP, State SIP Strategy, and Oil and Gas Regulation would include the reasonably foreseeable compliance responses described above under Section 5.D. As summarized in Table 5-8, the Scoping Plan First Update, LCFS/ADF regulations, RPS (as evaluated in the RES FED), SLCP, and State SIP Strategy environmental documents identified potentially significant and unavoidable impacts on agricultural and forest resources due to construction and operation of individual projects. Thus, implementation of these programs could result in a significant cumulative effect.

The Proposed Project's contribution to this significant impact would be cumulatively considerable due to potential agricultural and forest resources impacts associated with

implementation of mine methane capture offset projects related to linkage with Ontario, Canada. While compliance with relevant and applicable laws and regulations would reduce impacts in the U.S., it is unknown where and under which jurisdiction individual projects may be located in Canada as a result of linkage with Ontario, Canada. As a result, agricultural and forest resources impacts may be substantial. Thus the Proposed Project could result in a **cumulatively considerable contribution to a significant cumulative impact** on agricultural and forest resources.

3. Air Quality

Table 5-9
Summary of Air Quality Impacts under Related Projects and Proposed Project

	Scoping Plan First Update [1]	LCFS/ADF Regulation	RES [2]	SLCP	State SIP Strategy	Oil and Gas	CPP/C&T
Significance Conclusion	PSU	PSU	PSU	PSU	PSU	LTS	PSU

Notes: LCFS/ADF=Low Carbon Fuel Standard/Alternative Diesel Fuels; RES=Renewable Electricity Standard; SLCP=Short-Lived Compliant Pollutant; SIP=State Implementation Plan; CPP/C&T=Clean Power Plan/Cap and Trade Regulation; LTS=less-than-significant; PSU=potentially significant and unavoidable.
[1] Significance conclusions under the Scoping Plan First Update column indicate the greatest level of impacts (e.g., potentially significant and unavoidable) reported under the nine sectors, see Table 5-1 for more detailed information. [2] RES (as adopted by the Board) is not being implemented, rather the RES impacts are considered similar to impacts of the RPS standard codified by legislation.

Impacts to air quality associated with extension of the cap beyond 2020, extension of allowance allocation beyond 2020, incorporation of results of leakage studies for post-2020 industrial allocation, and compliance with CPP would be potentially significant and unavoidable, related to construction-related activities and operations that may be reasonably foreseeable compliance responses for covered entities. Impacts related to implementation of offset projects would be less-than-significant in California with the exception of the Livestock Protocol which would result in potentially significant odor-related impacts. Air quality impacts related to linkage to Ontario, Canada would be potentially significant and unavoidable related to compliance responses by covered entities, mine methane capture offset projects and less-than-significant related to ODS and landfill offset projects.

Implementation of the Scoping Plan First Update, LCFS/ADF regulations, RPS (as evaluated in the RES FED), SLCP, State SIP Strategy, and Oil and Gas Regulation would include the reasonably foreseeable compliance responses described above under Section 5.D. As summarized in Table 5-9, the Scoping Plan First Update, LCFS/ADF regulations, RPS (as evaluated in the RES FED), SLCP, and State SIP Strategy environmental documents identified potentially significant and unavoidable

impacts on air quality due to construction and operation of individual projects. Thus, implementation of these programs could result in a significant cumulative effect.

The Proposed Project's contribution to this significant impact would be cumulatively considerable due to potential air quality impacts associated with construction-related activities and operational activities that may be reasonably foreseeable compliance responses for covered entities, as well as implementation of mine methane capture offset projects related to linkage with Ontario, Canada. While compliance with relevant and applicable laws and regulations would reduce impacts in the United States, it is unknown where and under which jurisdiction individual projects may be located in Canada as a result of linkage with Ontario, Canada. As a result, air quality impacts may be substantial. Thus the Proposed Project could result in a **cumulatively considerable contribution to a significant cumulative impact** on air quality.

4. Biological Resources

Table 5-10
Summary of Biological Resources Impacts under Related Projects and Proposed Project

	Scoping Plan First Update [1]	LCFS/ADF Regulation	RES [2]	SLCP	State SIP Strategy	Oil and Gas	CPP/C&T
Significance Conclusion	PSU	PSU	PSU	PSU	PSU	PSU	PSU

Notes: LCFS/ADF=Low Carbon Fuel Standard/Alternative Diesel Fuels; RES=Renewable Electricity Standard; SLCP=Short-Lived Compliant Pollutant; SIP=State Implementation Plan; CPP/C&T=Clean Power Plan/Cap and Trade Regulation; LTS=less-than-significant; PSU=potentially significant and unavoidable.
[1] Significance conclusions under the Scoping Plan First Update column indicate the greatest level of impacts (e.g., potentially significant and unavoidable) reported under the nine sectors, see Table 5-1 for more detailed information. [2] RES (as adopted by the Board) is not being implemented, rather the RES impacts are considered similar to impacts of the RPS standard codified by legislation.

Impacts to biological resources associated with extension of the cap beyond 2020, extension of allowance allocation beyond 2020, incorporation of results of leakage studies for post-2020 industrial allocation, implementation of reasonably foreseeable compliance responses by covered entities and offset project developers in Canada, and compliance with CPP would be potentially significant and unavoidable related to implementation of U.S. Forest and MMC Protocol projects and construction-related activities that may be reasonably foreseeable compliance responses for covered entities. Impacts related to ODS, Livestock, Urban Forest, and Rice Cultivation projects would be less-than-significant in California. Biological resources impacts associated with linkage with Ontario, Canada would be potentially significant and unavoidable

related to mine methane capture offset projects and compliance responses related to covered entities; and less-than-significant related to ODS and landfill offset projects.

Implementation of the Scoping Plan First Update, LCFS/ADF regulations, RPS (as evaluated in the RES FED), SLCP, State SIP Strategy, and Oil and Gas Regulation would include the reasonably foreseeable compliance responses described above under Section 5.D. As summarized in Table 5-10, the Scoping Plan First Update, LCFS/ADF regulations, RPS (as evaluated in the RES FED), SLCP, State SIP Strategy, and Oil and Gas regulation environmental documents identified potentially significant and unavoidable impacts on biological resources due to construction and operation of individual projects. Thus, implementation of these programs could result in a significant cumulative effect.

The Proposed Project's contribution to this significant impact could be cumulatively considerable due to potential biological resources impacts associated with construction activities to implement compliance responses by covered entities and implementation of mine methane capture offset projects related to linkage with Ontario, Canada. Mitigation measures are available to reduce potentially significant biological resources related to implementation of compliance resources by covered entities. However, the authority to determine project-level impacts and require project-level mitigation lies with the permitting agency for individual projects, and there is uncertainty related to the degree of mitigation that may ultimately be required. In addition, while compliance with relevant and applicable laws and regulations would reduce impacts related to MMC offset projects in the United States, it is unknown where and under which jurisdiction individual projects may be located in Canada as a result of linkage with Ontario, Canada. As a result, biological resources impacts may be substantial. Thus, the Proposed Project could result in a **cumulatively considerable contribution to a significant cumulative impact** on biological resources.

5. Cultural Resources

Table 5-11
Summary of Cultural Resources Impacts under Related Projects and Proposed Project

	Scoping Plan First Update [1]	LCFS/ADF Regulation	RES [2]	SLCP	State SIP Strategy	Oil and Gas	CPP/C&T
Significance Conclusion	PSU	PSU	PSU	PSU	PSU	PSU	PSU

Notes: LCFS/ADF=Low Carbon Fuel Standard/Alternative Diesel Fuels; RES=Renewable Electricity Standard; SLCP=Short-Lived Compliant Pollutant; SIP=State Implementation Plan; CPP/C&T=Clean Power Plan/Cap and Trade Regulation; LTS=less-than-significant; PSU=potentially significant and unavoidable.
[1] Significance conclusions under the Scoping Plan First Update column indicate the greatest level of impacts (e.g., potentially significant and unavoidable) reported under

the nine sectors, see Table 5-1 for more detailed information. [2] RES (as adopted by the Board) is not being implemented, rather the RES impacts are considered similar to impacts of the RPS standard codified by legislation.

Impacts to cultural resources associated with extension of the cap beyond 2020, extension of allowance allocation beyond 2020, incorporation of results of leakage studies for post-2020 industrial allocation, and compliance with CPP would be potentially significant and unavoidable related to ground disturbances associated with actions related to the reasonably foreseeable compliance responses under covered entities and implementation of Livestock, Urban Forest, and MMC Protocol projects. Impacts related to ODS and U.S. Forest Protocol projects would be less-than-significant in California. Cultural resources impacts associated with linkage with Ontario, Canada would be potentially significant and unavoidable related to mine methane capture offset projects; and less-than-significant related to ODS and landfill offset projects.

Implementation of the Scoping Plan First Update, LCFS/ADF regulations, RPS (as evaluated in the RES FED), SLCP, State SIP Strategy, and Oil and Gas Regulation would include the reasonably foreseeable compliance responses described above under Section 5.D. As summarized in Table 5-11, the Scoping Plan First Update, LCFS/ADF regulations, RPS (as evaluated in the RES FED), SLCP, State SIP Strategy, and Oil and Gas regulation environmental documents identified potentially significant and unavoidable impacts on cultural resources due to construction and operation of individual projects. Thus, implementation of these programs could result in a significant cumulative effect.

The Proposed Project's contribution to this significant impact would be cumulatively considerable related to ground disturbances associated with reasonably foreseeable compliance responses by covered entities and implementation of Livestock, Urban Forest, and Forest projects in the United States and mine methane capture offset projects in the United States and Canada. Mitigation measures are available to reduce potentially significant cultural resources related to implementation of compliance resources by covered entities. However, the authority to determine project-level impacts and require project-level mitigation lies with the permitting agency for individual projects, and there is uncertainty related to the degree of mitigation that may ultimately be required. In addition, while compliance with relevant and applicable laws and regulations would reduce impacts related to mine methane capture offset projects in the United States, it is unknown where and under which jurisdiction individual projects may be located in Canada as a result of linkage with Ontario, Canada. As a result, cultural resources impacts may be substantial. Thus the Proposed Project could result in a **cumulatively considerable contribution to a significant cumulative impact** on cultural resources.

6. Energy Demand

Table 5-12
Summary of Energy Demand Impacts under Related Projects and Proposed Project

	Scoping Plan First Update [1]	LCFS/ADF Regulation	RES [2]	SLCP	State SIP Strategy	Oil and Gas	CPP/C&T
Significance Conclusion	LTS	LTS	N/A	LTS	LTS	LTS	LTS

Notes: LCFS/ADF=Low Carbon Fuel Standard/Alternative Diesel Fuels; RES=Renewable Electricity Standard; SLCP=Short-Lived Compliant Pollutant; SIP=State Implementation Plan; CPP/C&T=Clean Power Plan/Cap and Trade Regulation; LTS=less-than-significant; PSU=potentially significant and unavoidable. [1] Significance conclusions under the Scoping Plan First Update column indicate the greatest level of impacts (e.g., potentially significant and unavoidable) reported under the nine sectors, see Table 5-1 for more detailed information. [2] RES (as adopted by the Board) is not being implemented, rather the RES impacts are considered similar to impacts of the RPS standard codified by legislation.

Impacts to energy demand associated with extension of the cap beyond 2020, extension of allowance allocation beyond 2020, incorporation of results of leakage studies for post-2020 industrial allocation, and compliance with CPP would be less-than-significant. Implementation of offset project associated with California's Cap-and-Trade Program would result in less-than-significant impacts on energy demand. Linkage to Ontario, Canada would result in less-than-significant impacts on energy demand.

Implementation of the Scoping Plan First Update, LCFS/ADF regulations, RPS (as evaluated in the RES FED), SLCP, State SIP Strategy, and Oil and Gas Regulation would include the reasonably foreseeable compliance responses described above under Section 5.D. As summarized in Table 5-12, the related projects would not result in significant impacts on energy demand. Thus, there would not be a significant cumulative effect resulting from the combination of related projects.

The Proposed Project would result in less-than-significant effects on energy demand related to implementation of compliance responses by covered entities. Thus the Proposed Project would **not result in a significant cumulative impact** on energy demand.

7. Geology, Soils, and Mineral Resources

Table 5-13
Summary of Geology, Soils, and Mineral resources Impacts under Related Projects and Proposed Project

	Scoping Plan First Update [1]	LCFS/ADF Regulation	RES [2]	SLCP	State SIP Strategy	Oil and Gas	CPP/C&T
Significance Conclusion	PSU	PSU	PSU	PSU	PSU	PSU	PSU

Notes: LCFS/ADF=Low Carbon Fuel Standard/Alternative Diesel Fuels; RES=Renewable Electricity Standard; SLCP=Short-Lived Compliant Pollutant; SIP=State Implementation Plan; CPP/C&T=Clean Power Plan/Cap and Trade Regulation; LTS=less-than-significant; PSU=potentially significant and unavoidable. [1] Significance conclusions under the Scoping Plan First Update column indicate the greatest level of impacts (e.g., potentially significant and unavoidable) reported under the nine sectors, see Table 5-1 for more detailed information. [2] RES (as adopted by the Board) is not being implemented, rather the RES impacts are considered similar to impacts of the RPS standard codified by legislation.

Impacts to geology, soils, and mineral resources associated with extension of the cap beyond 2020, extension of allowance allocation beyond 2020, incorporation of results of leakage studies for post-2020 industrial allocation, and compliance with CPP would be potentially significant and unavoidable related to construction-related activities that may be reasonably foreseeable compliance responses for covered entities. Impacts related to the offset projects would be less-than-significant in California. Geology, soils, and minerals impacts related to linkage with Ontario, Canada would be potentially significant and unavoidable related to implementation of mine methane capture offset projects; and less-than-significant related to ODS and landfill offset projects.

Implementation of the Scoping Plan First Update, LCFS/ADF regulations, RPS (as evaluated in the RES FED), SLCP, State SIP Strategy, and Oil and Gas Regulation would include the reasonably foreseeable compliance responses described above under Section 5.D. As summarized in Table 5-13, the Scoping Plan First Update, LCFS/ADF regulations, RPS (as evaluated in the RES FED), SLCP, State SIP Strategy, and Oil and Gas regulation environmental documents identified potentially significant and unavoidable impacts on geology, soils, and mineral resources due to construction and operation of individual projects. Thus, implementation of these programs could result in a significant cumulative effect.

The Proposed Project's contribution to this significant impact would be cumulatively considerable due to potential geology, soils, and mineral resources impacts associated with construction activities to implement compliance responses by covered entities and implementation of mine methane capture offset projects related to linkage with Ontario, Canada. Mitigation measures are available to reduce potentially significant geology,

soils, and minerals resources related to implementation of compliance resources by covered entities. However, the authority to determine project-level impacts and require project-level mitigation lies with the permitting agency for individual projects, and there is uncertainty related to the degree of mitigation that may ultimately be required. In addition, while compliance with relevant and applicable laws and regulations would reduce impacts related to mine methane capture offset projects in the United States, it is unknown where and under which jurisdiction individual projects may be located in Canada as a result of linkage with Ontario, Canada. As a result, geology, soils, and mineral resources impacts may be substantial. Thus the Proposed Project could result in a **cumulatively considerable contribution to a significant cumulative impact** on geology, soils, and mineral resources.

8. Greenhouse Gases

Table 5-14
Summary of Greenhouse Gases Impacts under Related Projects and Proposed Project

	Scoping Plan First Update [1]	LCFS/ADF Regulation	RES [2]	SLCP	State SIP Strategy	Oil and Gas	CPP/C&T
Significance Conclusion	LTS	B	N/A	LTS	B	LTS	LTS

Notes: LCFS/ADF=Low Carbon Fuel Standard/Alternative Diesel Fuels; RES=Renewable Electricity Standard; SLCP=Short-Lived Compliant Pollutant; SIP=State Implementation Plan; CPP/C&T=Clean Power Plan/Cap and Trade Regulation; LTS=less-than-significant; PSU=potentially significant and unavoidable.
[1] Significance conclusions under the Scoping Plan First Update column indicate the greatest level of impacts (e.g., potentially significant and unavoidable) reported under the nine sectors, see Table 5-1 for more detailed information. [2] RES (as adopted by the Board) is not being implemented, rather the RES impacts are considered similar to impacts of the RPS standard codified by legislation.

Impacts to greenhouse gas (GHG) emissions associated with extension of the cap beyond 2020, extension of allowance allocation beyond 2020, incorporation of results of leakage studies for post-2020 industrial allocation, and compliance with CPP would be less-than-significant. Implementation of offset project associated with California's Cap-and-Trade Program would result in less-than-significant impacts on GHG emissions. Linkage to Ontario, Canada would result in less-than-significant impacts on GHG emissions.

Implementation of the Scoping Plan First Update, LCFS/ADF regulations, RPS (as evaluated in the RES FED), SLCP, State SIP Strategy, and Oil and Gas Regulation would include the reasonably foreseeable compliance responses described above under Section 5.D. As summarized in Table 5-14, the related projects would not result in

significant impacts on GHG emissions. Thus, there would not be a significant cumulative effect resulting from the combination of related projects.

The Proposed Project would result in less-than-significant effects on GHG emissions related to implementation of compliance responses by covered entities. Thus the Proposed Project would **not result in a significant cumulative impact** on GHG emission impacts.

9. Hazards and Hazardous Materials

Table 5-15
Summary of Hazards and Hazardous Materials Impacts under Related Projects and Proposed Project

	Scoping Plan First Update [1]	LCFS/ADF Regulation	RES [2]	SLCP	State SIP Strategy	Oil and Gas	CPP/C&T
Significance Conclusion	PSU	PSU	PSU	PSU	PSU	LTS	PSU

Notes: LCFS/ADF=Low Carbon Fuel Standard/Alternative Diesel Fuels; RES=Renewable Electricity Standard; SLCP=Short-Lived Compliant Pollutant; SIP=State Implementation Plan; CPP/C&T=Clean Power Plan/Cap and Trade Regulation; LTS=less-than-significant; PSU=potentially significant and unavoidable. [1] Significance conclusions under the Scoping Plan First Update column indicate the greatest level of impacts (e.g., potentially significant and unavoidable) reported under the nine sectors, see Table 5-1 for more detailed information. [2] RES (as adopted by the Board) is not being implemented, rather the RES impacts are considered similar to impacts of the RPS standard codified by legislation.

Impacts related to hazards and hazardous materials, associated with extension of the cap beyond 2020, extension of allowance allocation beyond 2020, incorporation of results of leakage studies for post-2020 industrial allocation, and compliance with CPP would be less-than-significant. Implementation of offset projects would result in less-than significant impacts in California. Hazards and hazardous materials impacts related to linkage with Ontario, Canada would be potentially significant and unavoidable related to mine methane capture offset projects; and less-than-significant related to ODS and landfill offset projects.

Implementation of the Scoping Plan First Update, LCFS/ADF regulations, RPS (as evaluated in the RES FED), SLCP, State SIP Strategy, and Oil and Gas Regulation would include the reasonably foreseeable compliance responses described above under Section 5.D. As summarized in Table 5-15, the Scoping Plan First Update, LCFS/ADF regulations, RPS (as evaluated in the RES FED), SLCP, and State SIP Strategy environmental documents identified potentially significant and unavoidable impacts on hazards and hazardous materials due to construction and operation of

individual projects. Thus, implementation of these programs could result in a significant cumulative effect.

The Proposed Project's contribution to this significant impact would be cumulatively considerable due to potential hazards and hazardous materials impacts, associated with implementation of mine methane capture offset projects related to linkage with Ontario, Canada. While compliance with relevant and applicable laws and regulations would reduce impacts in the United States, it is unknown where and under which jurisdiction individual projects may be located in Canada as a result of linkage with Ontario, Canada. As a result, hazards and hazardous materials impacts may be substantial. Thus the Proposed Project could result in a **cumulatively considerable contribution to a significant cumulative impact** on hazards and hazardous materials.

10. Hydrology and Water Quality

Table 5-16
Summary of Hydrology and Water Quality Impacts under Related Projects and Proposed Project

	Scoping Plan First Update [1]	LCFS/ADF Regulation	RES [2]	SLCP	State SIP Strategy	Oil and Gas	CPP/C&T
Significance Conclusion	PSU	PSU	PSU	PSU	PSU	PSU	PSU

Notes: LCFS/ADF=Low Carbon Fuel Standard/Alternative Diesel Fuels; RES=Renewable Electricity Standard; SLCP=Short-Lived Compliant Pollutant; SIP=State Implementation Plan; CPP/C&T=Clean Power Plan/Cap and Trade Regulation; LTS=less-than-significant; PSU=potentially significant and unavoidable.
[1] Significance conclusions under the Scoping Plan First Update column indicate the greatest level of impacts (e.g., potentially significant and unavoidable) reported under the nine sectors, see Table 5-1 for more detailed information. [2] RES (as adopted by the Board) is not being implemented, rather the RES impacts are considered similar to impacts of the RPS standard codified by legislation.

Impacts to hydrology and water quality associated with extension of the cap beyond 2020, extension of allowance allocation beyond 2020, incorporation of results of leakage studies for post-2020 industrial allocation, implementation of reasonably foreseeable compliance responses by covered entities and offset project developers in Canada, and compliance with CPP would be potentially significant and unavoidable related to construction-related activities that may be reasonably foreseeable compliance responses for covered entities. Impacts related to offset projects would be less-than-significant in California. Hydrology and water quality impacts associated with linkage with Ontario, Canada would be potentially significant and unavoidable related to implementation of mine methane capture offset projects; and less-than-significant related to ODS and landfill offset projects.

Implementation of the Scoping Plan First Update, LCFS/ADF regulations, RPS (as evaluated in the RES FED), SLCP, State SIP Strategy, and Oil and Gas Regulation would include the reasonably foreseeable compliance responses described above under Section 5.D. As summarized in Table 5-16, the Scoping Plan First Update, LCFS/ADF regulations, RPS (as evaluated in the RES FED), SLCP, State SIP Strategy, and Oil and Gas regulation environmental documents identified potentially significant and unavoidable impacts on water quality and hydrology due to construction and operation of individual projects. Thus, implementation of these programs could result in a significant cumulative effect.

The Proposed Project's contribution to this significant impact would be cumulatively considerable due to potential water quality and hydrology impacts associated with construction activities to implement compliance responses by covered entities and implementation of mine methane capture offset projects related to linkage with Ontario, Canada. Mitigation measures are available to reduce potentially significant water quality and hydrology impacts related to implementation of compliance resources by covered entities. However, the authority to determine project-level impacts and require project-level mitigation lies with the permitting agency for individual projects, and there is uncertainty related to the degree of mitigation that may ultimately be required. In addition, while compliance with relevant and applicable laws and regulations would reduce impacts related to mine methane capture offset projects in the United States, it is unknown where and under which jurisdiction individual projects may be located in Canada as a result of linkage with Ontario, Canada. As a result, water quality and hydrology impacts may be substantial. Thus the Proposed Project could result in a **cumulatively considerable contribution to a significant cumulative impact** on hydrology and water quality.

11. Land Use and Planning

Table 5-17
Summary of Land Use and Planning Impacts under Related Projects and Proposed Project

	Scoping Plan First Update [1]	LCFS/ADF Regulation	RES [2]	SLCP	State SIP Strategy	Oil and Gas	CPP/C&T
Significance Conclusion	PSU	PSU	PSU	May not be consistent	LTS	LTS	PSU

Notes: LCFS/ADF=Low Carbon Fuel Standard/Alternative Diesel Fuels; RES=Renewable Electricity Standard; SLCP=Short-Lived Compliant Pollutant; SIP=State Implementation Plan; CPP/C&T=Clean Power Plan/Cap and Trade Regulation; LTS=less-than-significant; PSU=potentially significant and unavoidable. May not be consistent refers to a project's ability to be consistent with existing land use plans.
[1] Significance conclusions under the Scoping Plan First Update column indicate the

greatest level of impacts (e.g., potentially significant and unavoidable) reported under the nine sectors, see Table 5-1 for more detailed information. [2] RES (as adopted by the Board) is not being implemented, rather the RES impacts are considered similar to impacts of the RPS standard codified by legislation.

Impacts to land use and planning associated with extension of the cap beyond 2020, extension of allowance allocation beyond 2020, incorporation of results of leakage studies for post-2020 industrial allocation, implementation of reasonably foreseeable compliance responses by covered entities and offset project developers in Canada, and compliance with CPP would be potentially significant and unavoidable related to implementation of Forest offset projects. Impacts related to covered entities actions and ODS, Livestock, Urban Forest, Rice Cultivation, and MMC projects would be less-than-significant in California. Land use and planning impacts associated with linkage with Ontario, Canada would be less-than-significant related to mine methane capture offset projects; and less-than-significant related to ODS and landfill offset projects

Implementation of the Scoping Plan First Update, LCFS/ADF regulations, RPS (as evaluated in the RES FED), SLCP, State SIP Strategy, and Oil and Gas Regulation would include the reasonably foreseeable compliance responses described above under Section 5.D. As summarized in Table 5-17, the Scoping Plan First Update, LCFS/ADF regulations, RPS (as evaluated in the RES FED), and SLCP environmental documents identified potentially significant and unavoidable impacts on land use and planning due to construction and operation of individual projects. Thus, implementation of these programs could result in a significant cumulative effect.

The Proposed Project's contribution to this significant impact would be cumulatively considerable due to potential land use and planning impacts associated with construction activities to implement compliance responses by covered entities and implementation of the Forest offset Protocol. Mitigation measures are available to reduce potentially significant land use and planning impacts related to implementation of compliance resources by covered entities. However, the authority to determine project-level impacts and require project-level mitigation lies with the permitting agency for individual projects, and there is uncertainty related to the degree of mitigation that may ultimately be required. As a result, land use and planning impacts may be substantial. Thus the Proposed Project could result in a **cumulatively considerable contribution to a significant cumulative impact** on land use and planning.

12. Noise

Table 5-18
Summary of Noise Impacts under Related Projects and Proposed Project

	Scoping Plan First Update [1]	LCFS/ADF Regulation	RES [2]	SLCP	State SIP Strategy	Oil and Gas	CPP/C&T
Significance	PSU	PSU	PSU	PSU	PSU	LTS	PSU

Conclusion							

Notes: LCFS/ADF=Low Carbon Fuel Standard/Alternative Diesel Fuels; RES=Renewable Electricity Standard; SLCP=Short-Lived Compliant Pollutant; SIP=State Implementation Plan; CPP/C&T=Clean Power Plan/Cap and Trade Regulation; LTS=less-than-significant; PSU=potentially significant and unavoidable. [1] Significance conclusions under the Scoping Plan First Update column indicate the greatest level of impacts (e.g., potentially significant and unavoidable) reported under the nine sectors, see Table 5-1 for more detailed information. [2] RES (as adopted by the Board) is not being implemented, rather the RES impacts are considered similar to impacts of the RPS standard codified by legislation.

Impacts to noise associated with extension of the cap beyond 2020, extension of allowance allocation beyond 2020, incorporation of results of leakage studies for post-2020 industrial allocation, implementation of reasonably foreseeable compliance responses by covered entities and offset project developers in Canada, and compliance with CPP would be significant and unavoidable related to implementation of Livestock offset projects. Impacts related to actions taken by covered entities and the ODS, Urban Forest, Forest, Rice Cultivation, and MMC offset projects would be less-than-significant for reasonably foreseeable compliance responses associated with California's Cap-and-Trade Regulation. Noise impacts associated with linkage with Ontario, Canada would be less-than-significant related to implementation of ODS, landfill, and mine methane capture offset projects.

Implementation of the Scoping Plan First Update, LCFS/ADF regulations, RPS (as evaluated in the RES FED), SLCP, State SIP Strategy, and Oil and Gas Regulation would include the reasonably foreseeable compliance responses described above under Section 5.D. As summarized in Table 5-18, the Scoping Plan First Update, LCFS/ADF regulations, RPS (as evaluated in the RES FED), SLCP, and State SIP Strategy environmental documents identified potentially significant and unavoidable impacts on noise due to construction and operation of individual projects. Thus, implementation of these programs could result in a significant cumulative effect.

The Proposed Project's contribution to this significant impact would be cumulatively considerable due to potential noise impacts associated with construction activities to implement compliance responses by covered entities and implementation of Livestock offset projects. Mitigation measures are available to reduce potentially significant noise impacts related to implementation of compliance resources by covered entities. However, the authority to determine project-level impacts and require project-level mitigation lies with the permitting agency for individual projects, and there is uncertainty related to the degree of mitigation that may ultimately be required. As a result, noise impacts may be substantial. Thus the Proposed Project could result in a **cumulatively considerable contribution to a significant cumulative impact** on noise.

13. Population and Housing

Table 5-19
Summary of Population and Housing Impacts under Related Projects and Proposed Project

	Scoping Plan First Update [1]	LCFS/ADF Regulation	RES [2]	SLCP	State SIP Strategy	Oil and Gas	CPP/C&T
Significance Conclusion	LTS	LTS	N/A	LTS	LTS	LTS	LTS

Notes: LCFS/ADF=Low Carbon Fuel Standard/Alternative Diesel Fuels; RES=Renewable Electricity Standard; SLCP=Short-Lived Compliant Pollutant; SIP=State Implementation Plan; CPP/C&T=Clean Power Plan/Cap and Trade Regulation; LTS=less-than-significant; PSU=potentially significant and unavoidable.
[1] Significance conclusions under the Scoping Plan First Update column indicate the greatest level of impacts (e.g., potentially significant and unavoidable) reported under the nine sectors, see Table 5-1 for more detailed information. [2] RES (as adopted by the Board) is not being implemented, rather the RES impacts are considered similar to impacts of the RPS standard codified by legislation.

Impacts to population and housing associated with extension of the cap beyond 2020, extension of allowance allocation beyond 2020, incorporation of results of leakage studies for post-2020 industrial allocation, implementation of reasonably foreseeable compliance responses by covered entities and offset project developers in Canada, and compliance with CPP would be less-than-significant. Implementation of offset projects would result in less-than significant impacts in California. Population and housing impacts associated with linkage with Ontario, Canada would be less-than-significant related to ODS, Landfill, and MMC offset projects

Implementation of the Scoping Plan First Update, LCFS/ADF regulations, RPS (as evaluated in the RES FED), SLCP, State SIP Strategy, and Oil and Gas Regulation would include the reasonably foreseeable compliance responses described above under Section 5.D. As summarized in Table 5-19, the Scoping Plan First Update, LCFS/ADF regulations, RPS (as evaluated in the RES FED), SLCP, and State SIP Strategy environmental documents identified less-than-significant impacts population and housing. Thus, there would not be a significant cumulative effect resulting from the combination of related projects.

The Proposed Project would not combine with other related projects to result in a cumulatively significant impact because individual projects would not be expected to result in substantial increases in population or housing compared to the existing conditions. The Proposed Project would result in less-than-significant effects on population and housing related to implementation of compliance responses by covered

entities. Thus the Proposed Project would **not result in a significant cumulative impact** on population and housing.

14. Public Services

Table 5-20
Summary of Public Services Impacts under Related Projects and Proposed Project

	Scoping Plan First Update [1]	LCFS/ADF Regulation	RES [2]	SLCP	State SIP Strategy	Oil and Gas	CPP/C&T
Significance Conclusion	LTS	LTS	PSU	LTS	LTS	LTS	LTS

Notes: LCFS/ADF=Low Carbon Fuel Standard/Alternative Diesel Fuels; RES=Renewable Electricity Standard; SLCP=Short-Lived Compliant Pollutant; SIP=State Implementation Plan; CPP/C&T=Clean Power Plan/Cap and Trade Regulation; LTS=less-than-significant; PSU=potentially significant and unavoidable. [1] Significance conclusions under the Scoping Plan First Update column indicate the greatest level of impacts (e.g., potentially significant and unavoidable) reported under the nine sectors, see Table 5-1 for more detailed information. [2] RES (as adopted by the Board) is not being implemented, rather the RES impacts are considered similar to impacts of the RPS standard codified by legislation.

Impacts to public services associated with extension of the cap beyond 2020, extension of allowance allocation beyond 2020, incorporation of results of leakage studies for post-2020 industrial allocation, implementation of reasonably foreseeable compliance responses by covered entities and offset project developers in Canada, and compliance with CPP would be less-than-significant. Implementation of offset projects would result in less-than significant impacts in California. Public services impacts associated with linkage with Ontario, Canada would be less-than-significant related to ODS, landfill, and mine methane capture offset projects.

Implementation of the Scoping Plan First Update, LCFS/ADF regulations, RPS (as evaluated in the RES FED), SLCP, State SIP Strategy, and Oil and Gas Regulation would include the reasonably foreseeable compliance responses described above under Section 5.D. As summarized in Table 5-20, the RPS (as evaluated in the RES FED) environmental document identified potentially significant and unavoidable impacts on public services. Thus, implementation of these programs could result in a significant cumulative effect.

The Proposed Project would not combine with other related projects to result in a cumulatively significant impact because individual projects would not be expected to demand additional public services compared to the existing conditions. Thus, the Proposed Project **would not result in a cumulatively considerable contribution to a significant cumulative impact** on public services.

15. Recreation

Table 5-21
Summary of Recreation Impacts under Related Projects and Proposed Project

	Scoping Plan First Update [1]	LCFS/ADF Regulation	RES [2]	SLCP	State SIP Strategy	Oil and Gas	CPP/C&T
Significance Conclusion	LTS	LTS	PSU	LTS	LTS	LTS	PSU

Notes: LCFS/ADF=Low Carbon Fuel Standard/Alternative Diesel Fuels; RES=Renewable Electricity Standard; SLCP=Short-Lived Compliant Pollutant; SIP=State Implementation Plan; CPP/C&T=Clean Power Plan/Cap and Trade Regulation; LTS=less-than-significant; PSU=potentially significant and unavoidable. [1] Significance conclusions under the Scoping Plan First Update column indicate the greatest level of impacts (e.g., potentially significant and unavoidable) reported under the nine sectors, see Table 5-1 for more detailed information. [2] RES (as adopted by the Board) is not being implemented, rather the RES impacts are considered similar to impacts of the RPS standard codified by legislation.

Impacts to recreation associated with extension of the cap beyond 2020, extension of allowance allocation beyond 2020, incorporation of results of leakage studies for post-2020 industrial allocation, implementation of reasonably foreseeable compliance responses by covered entities and offset project developers in Canada, and compliance with CPP would be less-than-significant. Implementation of offset projects would result in less-than-significant impacts in California. Recreation impacts associated with linkage to Ontario, Canada would be significant and unavoidable related to mine methane capture offset projects; and less-than-significant related to ODS and landfill offset projects.

Implementation of the Scoping Plan First Update, LCFS/ADF regulations, RPS (as evaluated in the RES FED), SLCP, State SIP Strategy, and Oil and Gas Regulation would include the reasonably foreseeable compliance responses described above under Section 5.D. As summarized in Table 5-21, the RPS (as evaluated in the RES FED) environmental document identified potentially significant and unavoidable impacts on recreation resources. Thus, implementation of these programs could result in a significant cumulative effect.

The Proposed Project's contribution to this significant impact would be cumulatively considerable due to potential recreation resources impacts, associated with implementation of mine methane capture offset projects related to linkage with Ontario, Canada. While compliance with relevant and applicable laws and regulations would reduce impacts in the United States, it is unknown where and under which jurisdiction individual projects may be located in Canada as a result of linkage with Ontario, Canada. As a result, impacts on recreation resources may be substantial. Thus the

Proposed Project could result in a **cumulatively considerable contribution to a significant cumulative impact** on recreation resources.

16. Transportation and Traffic

Table 5-22
Summary of Transportation and Traffic Impacts under Related Projects and Proposed Project

	Scoping Plan First Update [1]	LCFS/ADF Regulation	RES [2]	SLCP	State SIP Strategy	Oil and Gas	CPP/C&T
Significance Conclusion	PSU	PSU	PSU	PSU	PSU	LTS	PSU

Notes: LCFS/ADF=Low Carbon Fuel Standard/Alternative Diesel Fuels; RES=Renewable Electricity Standard; SLCP=Short-Lived Compliant Pollutant; SIP=State Implementation Plan; CPP/C&T=Clean Power Plan/Cap and Trade Regulation; LTS=less-than-significant; PSU=potentially significant and unavoidable.
[1] Significance conclusions under the Scoping Plan First Update column indicate the greatest level of impacts (e.g., potentially significant and unavoidable) reported under the nine sectors, see Table 5-1 for more detailed information. [2] RES (as adopted by the Board) is not being implemented, rather the RES impacts are considered similar to impacts of the RPS standard codified by legislation.

Impacts to transportation and traffic associated with extension of the cap beyond 2020, extension of allowance allocation beyond 2020, incorporation of results of leakage studies for post-2020 industrial allocation, implementation of reasonably foreseeable compliance responses by covered entities and offset project developers in Canada, and compliance with CPP would be significant and unavoidable related to implementation of Livestock offset projects. Impacts related to actions taken by covered entities and the ODS, Urban Forest, Forest Rice Cultivation, and MMC offset projects would be less-than-significant in California. Transportation and traffic impacts associated with linkage to Ontario, Canada would be less-than-significant related to ODS, landfill, and mine methane capture offset projects.

Implementation of the Scoping Plan First Update, LCFS/ADF regulations, RPS (as evaluated in the RES FED), SLCP, State SIP Strategy, and Oil and Gas Regulation would include the reasonably foreseeable compliance responses described above under Section 5.D. As summarized in Table 5-22, the Scoping Plan First Update, LCFS/ADF regulations, RPS (as evaluated in the RES FED), SLCP, and State SIP Strategy environmental documents identified potentially significant and unavoidable impacts on traffic and transportation due to construction and operation of individual projects. Thus, implementation of these programs could result in a significant cumulative effect.

The Proposed Project's contribution to this significant impact would be cumulatively considerable due to potential traffic and transportation impacts associated with construction activities to implement compliance responses by covered entities and implementation of Livestock offset projects. Mitigation measures are available to reduce potentially significant traffic and transportation impacts related to implementation of compliance resources by covered entities. However, the authority to determine project-level impacts and require project-level mitigation lies with the permitting agency for individual projects, and there is uncertainty related to the degree of mitigation that may ultimately be required. As a result, traffic and transportation impacts may be substantial. Thus the Proposed Project could result in a **cumulatively considerable contribution to a significant cumulative impact** on traffic and transportation.

18. Utilities and Service System

Table 5-23
Summary of Utilities and Service System Impacts under Related Projects and Proposed Project

	Scoping Plan First Update [1]	LCFS/ADF Regulation	RES [2]	SLCP	State SIP Strategy	Oil and Gas	CPP/C&T
Significance Conclusion	PSU	PSU	PSU	PSU	PSU	LTS	LTS

Notes: LCFS/ADF=Low Carbon Fuel Standard/Alternative Diesel Fuels; RES=Renewable Electricity Standard; SLCP=Short-Lived Compliant Pollutant; SIP=State Implementation Plan; CPP/C&T=Clean Power Plan/Cap and Trade Regulation; LTS=less-than-significant; PSU=potentially significant and unavoidable.
[1] Significance conclusions under the Scoping Plan First Update column indicate the greatest level of impacts (e.g., potentially significant and unavoidable) reported under the nine sectors, see Table 5-1 for more detailed information. [2] RES (as adopted by the Board) is not being implemented, rather the RES impacts are considered similar to impacts of the RPS standard codified by legislation.

Impacts to utilities and service systems associated with extension of the cap beyond 2020, extension of allowance allocation beyond 2020, incorporation of results of leakage studies for post-2020 industrial allocation, implementation of reasonably foreseeable compliance responses by covered entities and offset project developers in Canada, and compliance with CPP would be less-than-significant. Impacts related to actions taken by covered entities and the ODS, Urban Forest, Forest Rice Cultivation, and MMC offset projects would be less-than-significant in California. Transportation and traffic impacts associated with linkage to Ontario, Canada would be less-than-significant related to ODS, landfill, and mine methane capture offset projects.

Implementation of the Scoping Plan First Update, LCFS/ADF regulations, RPS (as evaluated in the RES FED), SLCP, State SIP Strategy, and Oil and Gas Regulation would include the reasonably foreseeable compliance responses described above

under Section 5.D. As summarized in Table 5-23, the Scoping Plan First Update, LCFS/ADF regulations, RPS (as evaluated in the RES FED), SLCP, and State SIP Strategy environmental documents identified potentially significant and unavoidable impacts on utilities and service systems due to construction and operation of individual projects. Thus, implementation of these programs could result in a significant cumulative effect.

The Proposed Project would not combine with other related projects to result in a cumulatively considerable impact because individual projects would not result in substantial additional demand on utilities and service systems. Thus the Proposed Project would not result in a **cumulatively considerable contribution to a significant cumulative impact** on utilities and service systems.

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6.0 MANDATORY FINDINGS OF SIGNIFICANCE

Consistent with the requirements of State of California Environmental Quality Act (CEQA) Guidelines (Cal. Code Regs., tit. 14, § 15000 et. seq.), Appendix G, Environmental Checklist, Section 18, the *Functional Equivalent Document prepared for the California Cap on Greenhouse Gas (GHG) Emissions and Market-Based Compliance Mechanisms* (2010 FED) for California's Cap-and-Trade Regulation addressed the mandatory findings of significance as discussed below. The 2010 FED for California's Cap-and-Trade Regulation also included discussions on significant and unavoidable environmental effects and significant and irreversible environmental changes.

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

A finding of significance is required if a project "has the potential to substantially degrade the quality of the environment (Cal. Code Regs., tit. 14, § 15065(a))." In practice, this is the same standard as a significant 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 (Cal. Code Regs., tit. 14, § 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 of 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. ARB would not be the agency responsible for conducting the project-specific environmental or approval reviews because it is not the agency with authority for making land use or project implementation decisions.

This Draft Environmental Analysis (EA), and documents incorporated by reference, addressed and disclosed potential environmental effects associated with implementation of California's Cap-and-Trade Regulation Amendments. As described in Chapter 4 of this Draft EA, potential environmental impacts, the level of significance prior to mitigation, mitigation measures, and the level of significance after the incorporation of mitigation measures is disclosed.

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

A lead agency shall find that a project may have a significant effect on the environment where there is substantial evidence that the project has potential environmental effects that are individually limited, but cumulatively considerable (Cal. Code Regs., tit. 14, § 15065). Cumulatively considerable means "that the incremental effects of an individual project are significant when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects (Cal. Code Regs., tit. 14, § 15065(a)(3))." Cumulative impacts are discussed in Chapter 5 in the Draft EA.

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

A lead agency shall find that a project may have a significant 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 (Cal. Code Regs., tit. 14, § 15065(a)(4)). Under this standard, a change to the physical environment that might otherwise be minor must be treated as significant if people would be significantly affected. This factor relates to adverse changes to the environment of human beings generally, and not to 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, "Impact Analysis" of this Draft EA.

7.0 ALTERNATIVES ANALYSIS

This section satisfies the California Environmental Quality Act (CEQA) requirements related to alternatives to the Proposed Project (Cal. Code Regs., tit. 14 § 15126.6). The following discussion provides an overview of the steps taken to develop alternatives to the Proposed Project (i.e., adoption of the Cap-and-Trade Regulation Amendments), the project objectives associated with the proposed action, and an analysis of the alternatives' environmental effects and ability to meet the project objectives.

A. Approach to Alternatives Analysis

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

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

While ARB, by virtue of its certified program, is exempt from Chapters 3 and 4 of CEQA and corresponding sections of the CEQA Guidelines (Cal. Code Regs., tit. 14, § 15000 et. seq.), the Guidelines nevertheless provide useful information for preparation of a thorough and meaningful alternatives analysis. The CEQA Guidelines (Cal. Code Regs., tit. 14 § 15126.6) speak to evaluation of "a range of reasonable alternatives to the project, or the location of the project, which would feasibly attain most of the basic project objectives but would avoid or substantially lessen any of the significant effects, and evaluate the comparative merits of the alternatives." The purpose of the alternatives analysis is to determine whether or not different approaches to or variations of the project would reduce or eliminate significant project impacts, within the basic framework of the objectives, a principle that is consistent with ARB's program requirements.

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

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

B. Project Objectives

The objectives of the Proposed Project are to:

1. Continue Objectives of 2010 Cap-and-Trade Program
2. Meet Long-Term Climate Objectives Beyond 2020
3. Streamline the Implementation of the Cap-and-Trade Program
4. Extend Allowance Allocation Beyond 2020 and Incorporate Results of Leakage Studies
5. Facilitate Linkage with Other Western Climate Initiative (WCI) Markets
6. Comply with the Federal Clean Power Plan (CPP)
7. Ensure Compliance Obligations are Accurately Assessed for Imported Electricity7.

These objectives are described in greater detail in Chapter 2, above.

C. Description of Alternatives

Detailed descriptions of each alternative are presented below. The analysis that follows the descriptions of the alternatives includes a discussion of the degree to which each alternative would meet the basic project objectives, and the extent to which each alternative would avoid potentially significant impacts identified in Chapter 4 of this Draft Environmental Analysis (EA).

1. Alternative 1: No-Project Alternative

a) Alternative 1 Description

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

Under the No-Project Alternative, amendments associated with the Proposed Project would not be approved. The Cap-and-Trade Program would expire and conclude after it completes its third compliance period in 2020. No linkages with Ontario, Canada would occur, and linkages with Québec would also expire and conclude in 2020. Other ARB

programs intended to reduce GHG emissions would continue in accordance with their statutory authorities and adopted regulations.

b) Alternative 1 Discussion

i) Objectives

The No-Project Alternative would fail to meet many of the project objectives listed in Chapter 2 and reiterated above. A major component of the AB 32 Scoping Plan strategy for reducing GHG would expire and not contribute to further reductions after 2020. The No-Project Alternative does not include streamlining of the Program, would not continue objectives of the 2010 Cap-and-Trade Program, expand the availability of approved offset credits, would not incorporate results of leakage studies, and would not facilities linkages with other WCI Markets (Objectives 1-5). Without submission of approved Cap-and-Trade amendments, regulatory amendments to facilitate CPP compliance would not occur and Objective 6 would also not be satisfied. Without further amendments to address new CAISO markets, emissions obligations could be incompletely applied to those markets, so Objective 7 would not be fully satisfied.

ii) Environmental Impacts

Implementation of Alternative 1 would avoid environmental impacts described in Chapter 4 of this Draft EA, which are primarily associated with construction disturbance related to implementation of specific compliance responses or projects to participate in offset protocols. Without implementation of a Cap-and-Trade Regulation, GHG reductions associated with California's Cap-and-Trade Program would be substantially impeded after 2020, compared to the Proposed Project, the beneficial environmental influence of reduced GHG emissions on climate change after 2020 and the air quality co-benefits associated with Cap-and-Trade compliance after 2020 would not be realized. The state's ability to contribute to the avoidance of the most environmentally damaging aspects of long-term climate change would be limited to benefits achieved in other programs.

In addition, failure to submit a CPP Compliance Plan for California to US EPA could result in preparation of a CPP Compliance Plan by US EPA for California. Because the exact contents of a federal plan for California are unknown and cannot be known at this time, an evaluation of the potential environmental impacts related to adoption of Alternative 1 is not feasible.

2. Alternative 2: Facility-Specific Requirements

a) Alternative 2 Description

Under Alternative 2, the Cap-and-Trade Program would not continue beyond 2020. Under Alternative 2, all covered entities would be required to achieve onsite emissions reductions from a historical baseline level to 40 percent below that level by 2030 with interim targets. There would be no trading of "excess reductions," in which an entity that exceeds the reduction target can sell excess reductions to another entity, or the use of

offset credits. While some flexibility would remain for each entity to decide how best to reduce emissions, Alternative 2 would eliminate any trading and would force emission reductions to be achieved on a facility-by-facility basis at a consistent rate over interim compliance periods. For large sectors, onsite emissions reductions could potentially be achieved through fuel switching and electrification of boilers. There is less potential to reduce process-related emissions for other sections, including the cement sector, and one potential compliance path may include production decreases at the facility.

Under Alternative 2, reaching the state-wide 2030 target may require greater stringency in existing complementary programs. This could include increasing the renewable electricity portfolio standard above the anticipated 50 percent by 2030 and/or requiring a greater percent reduction than the currently mandated 10 percent reduction in the carbon intensity of transportation fuels in the Low Carbon Fuel Standard (LCFS).

A facility-specific cap program design would require ARB to identify the specific facilities that would be covered by the program, conduct an appropriate analysis to support a specific cap for each facility, and consider whether the reduction requirements established to implement the declining cap for the facility would be cost-effective. Such a program would be difficult to apply to imported electricity or distributed use of fuels; thus, the overall scope of the program would likely need to be limited to industrial facilities and in-state power plants. Facility-specific caps would diminish the flexibility of the program, increasing both administrative complexity and cost to comply.

b) Alternative 2 Discussion

i) Objectives

This alternative represents an approach to reducing GHG emissions that is not consistent with the current Cap-and-Trade Regulation; that is, trading of allowances would not be available. Nonetheless, this alternative could meet objectives related to meeting the 2030 target set by EO B-30-15, and might be able to support compliance with CPP (Objectives 1, 2, and 6) by requiring facility-by-facility reductions if such reduction requirements could be designed to be effective and consistent with federal legal requirements. This approach of facility-level mandates is substantially different than the objective of the Cap-and-Trade Program, consistent with the mandates of AB 32, to incentivize the marketplace to reduce GHG emissions with price signals and an overall declining cap. Because it does not take advantage of market mechanisms, the approach is also likely to be less effective in achieving certain AB 32 objectives, such as cost-containment and minimizing leakage (Objective 1). Because it would not amend the Cap-and-Trade Regulation, as it is currently implemented, it would not be consistent with the objective of streamlining the program (Objective 3). In addition, removing the trade component would make the regulation inconsistent with expansion of available approved offset credits, incorporation of leakage study results, and facilitation of linkage with other WCI markets (Objectives 2, 4, and 5). Difficulties with addressing imported power under this alternative would also likely result in failure to satisfy Objective 6.

Consequently, Alternative 2 would achieve some, but not most, of the basic objectives of the Proposed Project.

Because Alternative 2 fails to achieve most of the project objectives, it does not meet the requirements set forth under CEQA regarding project alternatives. However, this alternative addresses broad program recommendations made by stakeholders during the initial planning of the Cap-and-Trade Regulation. It is therefore considered relevant to this Draft EA.

ii) Environmental Impacts

The types of impacts that would occur under Alternative 2 are similar to those described in Chapter 4, since the reasonably foreseeable compliance responses that could be implemented by covered entities under the Proposed Project could also be implemented to achieve facility-specific GHG reduction targets. There would be no environmental impacts related to offset projects, because the opportunity to purchase offset credits as a mechanism for meeting the cap would be eliminated. Thus, potential impacts resulting from the implementation of offset projects, including agricultural and forestry resources biological resources, cultural resources, land use and planning, noise, and transportation and traffic, would be reduced. Similarly, there would be none of the environmental benefits resulting from the development of project-based offset credits or sector-based offset credits.

As discussed above, this alternative may result in greater stringency within existing complementary programs, such as the Renewable Portfolio Standard (RPS) and the LCFS regulation. These programs aim to reduce GHG emissions through reduction in the carbon intensity of fuels, such as ethanol, renewable gasoline, hydrogen, electricity, renewable diesel, biodiesel, and using captured methane as a transportation fuel (LCFS); and design, construction, and operation of additional renewable energy facilities and transmission facilities within and beyond California (RPS). Implementation of projects related to LCFS could result in a shift in the types and locations from which feedstocks are used to produce ethanol toward lower-carbon options, increased use of biomass-based fuels such as biodiesel and/or renewable diesel in lieu of petroleum, and the use of electricity and zero-emission fuels. Potential RPS projects include wind power, solar thermal, solar photovoltaic, geothermal, solid-fuel biomass, biogas, and small hydroelectric sources, which would require associated electricity transmission projects.

Changes to LCFS and RPS targets would require separate actions by the Board and other agencies, including the necessary environmental analyses. Staff expects environmental impacts would be similar in type to those described in the EAs for LCFS and RES (ARB 2015b, ARB 2010b), but would be expected to occur at a greater magnitude in order to achieve more aggressive targets. These impacts, which are generally related to changes in land uses and construction activities, may include adverse effects on aesthetics, agricultural and forest resources, construction-related criteria pollutant and toxic emissions, biological resources, cultural resources, geology,

soils and minerals, hazards and hazardous materials, hydrology and water quality, land use and planning, noise, transportation and traffic, and utilities and service systems.

The challenge of fully accounting for imported power emissions under this alternative – both for the new CAISO markets and for existing power imports – would likely contribute to emissions leakage from California. This could occur by creating market incentives to import power from outside the state that might not be subject to effective emissions restrictions, rather than generating power from in-state sources subject to stringent standards.

3. Alternative 3: Carbon Fee

a) Alternative 3 Description

When the Cap-and-Trade Regulation was proposed in 2010, a per-metric-ton fee on GHG emissions was one of the alternatives considered. Here, ARB again considers such an alternative. Under Alternative 3, ARB would pursue a carbon fee for sectors that are currently covered by the cap-and-trade program. The primary similarity between a carbon fee and the cap-and-trade program is that both put a price on GHG emissions, providing an incentive for businesses and individuals to reduce their emissions, in contrast to a command-and-control approach in which government would mandate how much individual entities could emit or what technologies they should use (CBO 2008, p. 1).

The principal difference between a carbon fee and the cap-and-trade program is that a fee places an upper limit on the cost of reducing emissions, but leaves the total amount of GHG emissions in a given time period uncertain, whereas the cap-and-trade program sets a total limit on emissions during a particular period and allows supply and demand to determine the cost of emissions (CBO 2008, p.1). Below, the similarities and differences between a carbon fee and a cap-and-trade program are discussed in more detail in the context of the Proposed Project's objectives and potential impacts.

Alternative 3 incorporates concepts received from the Environmental Justice Advisory Committee regarding potential alternatives to the Cap-and-Trade Program. This alternative includes a fixed cost for each metric ton of carbon emitted, which is priced at the US EPA social cost of carbon of $36 per metric ton in 2015, increasing to $50 in 2030. (These values are in 2007 dollars and translate roughly to $48 to $57 in 2015 dollars.) Under Alternative 3, all revenue from this program would be fully returned to California consumers.

b) Alternative 3 Discussion

i) Objectives

Alternative 3 would implement a carbon fee that would provide price certainty, but an uncertain amount of emission reductions. There would be no absolute GHG emissions cap mandated by law, and there would likely be no allowance or offset credit trading as

occurred under the Proposed Project. Generally, this alternative is not consistent with the objectives of the Proposed Project to meet GHG emission targets while minimizing costs. Because this alternative would not set a specific emissions cap, there would be no guarantee that the chosen allowance cost would be sufficient to achieve the required GHG emissions reductions to meet 2030 targets set by EO B-30-15. It is also possible that this alternative could result in overshooting the target at an unnecessarily high cost. Because the primary goal of the Cap-and-Trade Program is to meet GHG emissions targets while minimizing costs, ARB staff believes a cap-and-trade program is a better match to California's goals. (Objectives 1-2,). While this alternative could offer more price certainty to regulated entities, it would result in less flexibility in achieving the GHG emissions targets since each metric ton of GHG emissions would incur a fee at a specific dollar amount. Because the Cap-and-Trade Program, as it is currently implemented, would no longer exist after 2020, a cap-and-trade program linkage between California and Québec would no longer exist. California would forgo future linkages of this type with other programs, such as the Ontario program (Objectives 5). Any potential federal trading system for CPP would also be forgone, therefore California would need to develop an alternate CPP compliance plan; though the form of any such plan is speculative, it likely would have to be in addition to the fee in this alternative, and so could add additional regulatory complexities and costs, thereby potentially not most effectively fulfilling the CPP compliance objective (Objective 6). Alternative 3 would also not be consistent with the objective of streamlining the Cap-and-Trade Program, since it would result in an entirely new program (Objective 3).

ii) Environmental Impacts

Under Alternative 3, there would be no emission reduction requirements specified by a cap, but similar emission reduction requirements could be required through direct regulation. There would be no allowance trading, although there could be trading in tax credits. Under this alternative, impacts would be related to actions by covered entities taken in response to the regulation-set price of carbon emissions through upgrading equipment, switching to lower intensity carbon fuels, and implementing maintenance and process changes at existing facilities. The impacts associated with these actions could be more widespread, and of greater magnitude than under the Proposed Project depending on the size and location of individual actions (i.e., impacts to biological resources, cultural resources, geology, soils, and minerals, hydrology and water quality, land use, and transportation and traffic), for covered entities that aim to make investments that would reduce long-term carbon costs. Alternatively, covered entities may opt to budget for greater carbon tax costs, which would ultimately reduce several adverse environmental effects compared to the Proposed Project, because fewer projects would be implemented to upgrade equipment, switch to lower intensity carbon fuels, and implement maintenance and process changes at existing facilities. It is unknown, and cannot feasibly be determined, if these reduced impacts would counteract potential increased environmental effects related to activities taken by covered entities in response to the cost of carbon emissions being incurred. The potential for these changes and their potential environmental effects would be related to

economic and other business-related conditions, determined by individual facilities subject to GHG reduction regulations.

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ATTACHMENT A: ENVIRONMENTAL AND REGULATORY SETTING

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This chapter contains the environmental and regulatory setting for the United States, Canada, and the State of California. A summary of the environmental setting is provided first, followed by the regulatory setting in the United States (Tables 1 – 18). Regulations pertaining to Canada are described separately in Section B, below.

1. ENVIRONMENTAL SETTING

Aesthetics

United States and Canada

The United States and Canada, by virtue of their size, setting, and topographic and climatic variation, exhibit tremendous scenic diversity. The varied landscape ranges from coastal to desert and valley to mountain. Innumerable natural features and settings combine to produce scenic resources that are treasured by residents and visitors alike.

California

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

Agriculture and Forest Resources

United States

Forests in the United States are very diverse in composition and distribution, including oak-hickory and maple-beech-birch forests, as well as fir, pine, and redwood forests. It is estimated that, at the beginning of European settlement (circa 1630), the area of forest land in the current boundaries of the United States was approximately 423 million hectares, or about 46 percent of the total land area. By 1907, the area of forest land had declined to an estimated 307 million hectares or 34 percent of the total land area. Forest area has been relatively stable since 1907. In 1997, 302 million hectares or 33 percent of the total land area of the United States was in forest land. As of 2000, forest land area amount to approximately 70 percent of the area that was forested in 1630. Since 1630, approximately 120 million hectares of forest land have been converted to other uses, primarily agriculture (USFS 2000).

United States land area amounts to nearly 2.3 billion acres, with nearly 1.2 billion acres in agricultural lands. The proportion of the land base in agricultural uses declined from 63 percent in 1949 to 51 percent in 2007, the latest year for which data are available. Gradual declines have occurred in cropland and pasture/range, while grazed forestland

has decreased more rapidly. In 2007, 408 million acres of agricultural land were in cropland (-17 percent from 1949), 614 million acres were in pasture and range (-3 percent), 127 million acres were in grazed forestland (-52 percent), and 12 million acres were in farmsteads and farm roads (-19 percent) (USDA 2016).

California

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

Prime Farmland—land that has the best combination of features for the production of agricultural crops;

Farmland of Statewide Importance—land other than Prime Farmland that has a good combination of physical and chemical features for the production of agricultural crops, but that has more limitations than Prime Farmland, such as greater slopes or less ability to store soil moisture;

Unique Farmland—land of lesser quality soils used for the production of the state's leading agricultural cash crops;

Farmland of Local Importance—land of importance to the local agricultural economy;

Grazing Land—existing vegetation that is suitable for grazing;

Urban and Built-Up Land—land occupied by structures in density of at least one dwelling unit per 1.5 acres;

Land Committed to Nonagricultural Use—vacant areas; existing land that has a permanent commitment to development but has an existing land use of agricultural or grazing lands; and

Other Land— land not included in any other mapping category, common examples of which include low-density rural developments, brush, timber, wetland, and vacant and nonagricultural land surrounded on all sides by urban development.

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

As of 2012, California contained approximately 5 million acres of Prime Farmland; approximately 2.6 million acres of Farmland of Statewide Important; approximately 1.3 million acres of Unique Farmland; approximately 3.2 million acres of Farmland of Local Importance; and approximately 19.2 million acres of grazing land (FMMP 2015).

1. Williamson Act

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

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

2. Forestry Resources

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

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

Canada

Canada has 348 million hectares (ha) of forest land. This represents 9% of the world's forests and 24% of the world's boreal forests. Forests dominate the Canadian landscape almost everywhere except the Arctic and the Prairies. The provinces and territories monitor regeneration and wood volume growth in the commercial forest areas they manage, collaborating with the federal government in this and many other aspects of sustainable forest management (NRCAN 2016a).

In the 2011 Census of Agriculture, more than 85,000 livestock farms were reported, representing 41.6% of all farms in Canada. In 2010, livestock farms reported total gross receipts of $24.4 billion and incurred $21.0 billion in operating expenses (Statistics Canada 2016).

Air Quality

United States

At the federal level, U.S. EPA has oversight of State programs. In addition, U.S. EPA established emission standards for mobile sources such as ships, trains, and airplanes. The U.S. EPA has set National Ambient Air Quality Standards for six principal pollutants, which are called criteria air pollutants. Periodically, the standards are reviewed and may be revised. The current standards are listed below. Units of measure for the standards are parts per million (ppm) by volume, parts per billion (ppb) by volume, and micrograms per cubic meter of air ($\mu g/m^3$).

California

The California Air Resources Board (ARB) is California's lead air agency and controls emissions from mobile sources, fuels, and consumer products, as well as air toxics. ARB also coordinates local and regional emission reduction measures and plans that meet federal and State air quality limits. At the federal level, the U.S. EPA has oversight of State programs. In addition, U.S. EPA alone has jurisdiction to establish emission standards for certain mobile sources such as ships, trains, and airplanes.

1. Criteria Air Pollutants

Concentrations of emissions of criteria air pollutants are used to indicate the quality of the ambient air because these are the most prevalent air pollutants known to be deleterious to human health. A brief description of each CAP is provided below. Emission source types and health effects are summarized in Table A1-1.

Table A1-1: Sources and Health Effects of Criteria Air Pollutants

Pollutant	Sources	Acute[1] Health Effects	Chronic[2] Health Effects
Ozone	Secondary pollutant resulting from reaction of reactive organic gases (ROG) and oxides of nitrogen (NO_X) in presence of sunlight. ROG emissions result from incomplete combustion and evaporation of chemical solvents and fuels; NO_X results from the combustion of fuels	Increased respiration and pulmonary resistance; cough, pain, shortness of breath, lung inflammation	Permeability of respiratory epithelia, possibility of permanent lung impairment

Table A1-1: Sources and Health Effects of Criteria Air Pollutants			
Pollutant	**Sources**	**Acute[1] Health Effects**	**Chronic[2] Health Effects**
Carbon monoxide (CO)	Incomplete combustion of fuels; motor vehicle exhaust	Headache, dizziness, fatigue, nausea, vomiting, death	Permanent heart and brain damage
Nitrogen dioxide (NO_2)	Combustion devices; e.g., boilers, gas turbines, and mobile and stationary reciprocating internal combustion engines	Coughing, difficulty breathing, vomiting, headache, eye irritation, chemical pneumonitis or pulmonary edema; breathing abnormalities, cough, cyanosis, chest pain, rapid heartbeat, death	Chronic bronchitis, decreased lung function
Sulfur dioxide (SO_2)	Coal and oil combustion, steel mills, refineries, and pulp and paper mills	Irritation of upper respiratory tract, increased asthma symptoms	Insufficient evidence linking SO_2 exposure to chronic health impacts
Respirable particulate matter (PM_{10}) and fine particulate matter ($PM_{2.5}$)	Fugitive dust, soot, smoke, mobile and stationary sources, construction, fires and natural windblown dust, and formation in The atmosphere by condensation and/or transformation of SO_2 and ROG	Breathing and respiratory symptoms, aggravation of existing respiratory and cardiovascular diseases, premature death	Alterations to the immune system, carcinogenesis
Lead	Metal processing	Reproductive/ developmental effects (fetuses and children)	Numerous effects including neurological, endocrine, and cardiovascular effects

[1] Acute" refers to effects of short-term exposures to criteria air pollutants, usually at relatively high concentrations.
[2] Chronic" refers to effects of long-term exposures to criteria air pollutants, even at relatively low concentrations.
Sources: US EPA 2011.

2. Ozone

Ozone is a photochemical oxidant (a substance whose oxygen combines chemically with another substance in the presence of sunlight) and the primary component of smog. Ozone is not directly emitted into the air but is formed through complex chemical reactions between precursor emissions of reactive organic gases (ROG) and oxides of

nitrogen (NO_X) in the presence of sunlight. ROG are volatile organic compounds that are photochemically reactive. ROG emissions result primarily from incomplete combustion and the evaporation of chemical solvents and fuels. NO_X are a group of gaseous compounds of nitrogen and oxygen that result from the combustion of fuels.

Anthropogenic emissions of the ozone precursors ROG and NO_X have decreased over the past several years because of more stringent motor vehicle standards and cleaner burning fuels. During the last 20 years the maximum amount of ROG and NO_X over an 8-hour period decreased by 17 percent. However, most counties in California are still in nonattainment for ozone.

3. Nitrogen Dioxide

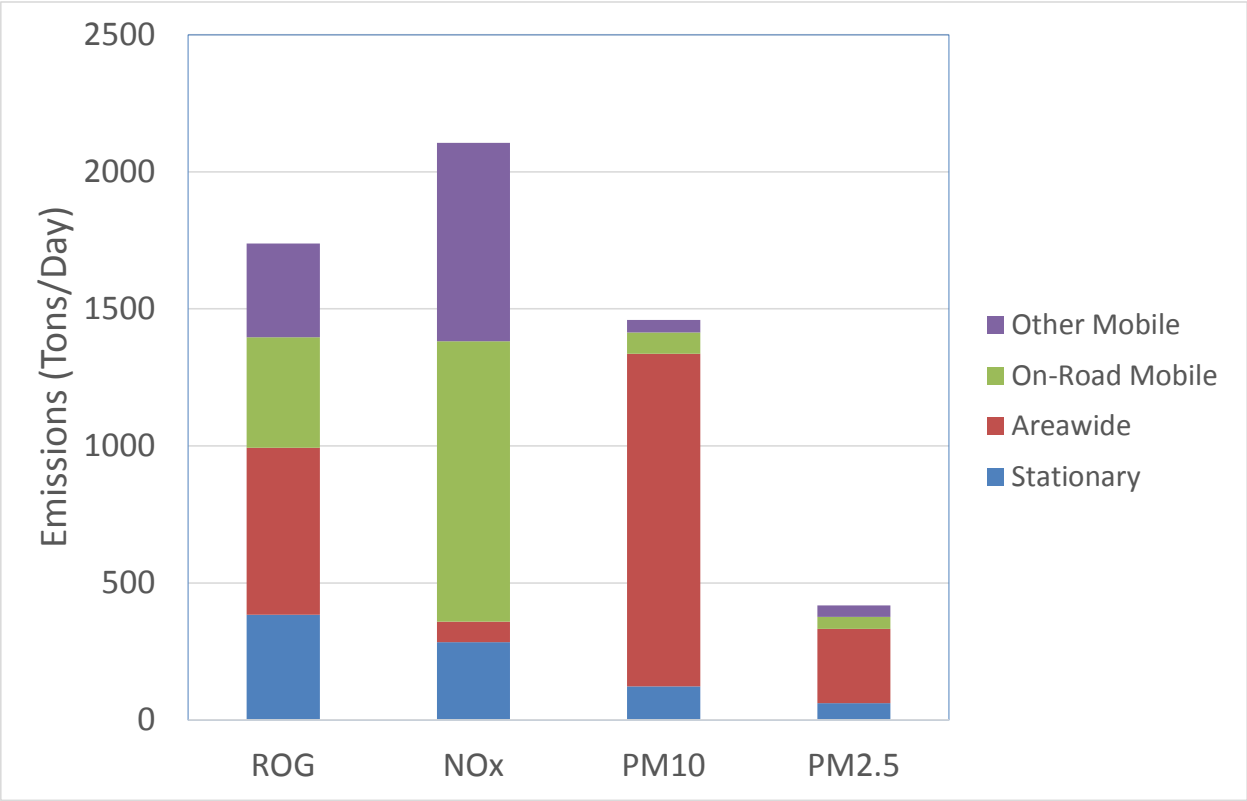
NO_2 is a brownish, highly-reactive gas that is present in all urban environments. The major human-made sources of NO_2 are combustion devices, such as boilers, gas turbines, and mobile and stationary reciprocating internal combustion engines. Combustion devices emit primarily nitric oxide (NO), which reacts through oxidation in the atmosphere to form NO_2. The combined emissions of NO and NO_2 are referred to as NO_X and are reported as equivalent NO_2. Because NO_2 is formed and depleted by reactions associated with photochemical smog (ozone), the NO_2 concentration in a particular geographical area may not be representative of the local sources of NO_X emissions (U.S. EPA 2011).

4. Particulate Matter

Respirable particulate matter with an aerodynamic diameter of 10 micrometers or less is referred to as PM_{10}. PM_{10} consists of particulate matter emitted directly into the air, such as fugitive dust, soot, and smoke from mobile and stationary sources, construction equipment, fires and natural windblown dust, and particulate matter formed in the atmosphere by reaction of gaseous precursors (ARB 2009). $PM_{2.5}$ includes a subgroup of smaller particles that have an aerodynamic diameter of 2.5 micrometers or less. PM_{10} emissions in California are dominated by emissions from area sources, primarily fugitive dust from vehicle travel on unpaved and paved roads, farming operations, construction and demolition, and particles from residential fuel combustion. Direct emissions of PM_{10} have increased slightly in California over the last 20 years, and are projected to continue to increase. $PM_{2.5}$ emissions have remained relatively steady over the last 20 years and are projected to increase slightly through 2020. Emissions of $PM_{2.5}$ are dominated by the same sources as emissions of PM_{10} (ARB 2009).

5. Emission Inventory

Exhibit 1 summarizes emissions of CAPs within California for various source categories. According to California's emission inventory, mobile sources are the largest contributor to the estimated annual average for air pollutant levels of ROG and NO_X accounting for approximately 43 percent and 83 percent, respectively, of the total emissions. Area wide sources account for approximately 83 percent and 65 percent of California's PM_{10} and $PM_{2.5}$ emissions, respectively (ARB 2013).



Source: ARB 2013
Exhibit 1 California 2012 Emission Inventory

6. Toxic Air Contaminants

Concentrations of toxic air contaminants (TACs) are also used to indicate the quality of ambient air. A TAC is defined as an air pollutant that may cause or contribute to an increase in mortality or in serious illness, or that may pose a hazard to human health. TACs are usually present in minute quantities in the ambient air; however, their high toxicity or health risk may pose a threat to public health even at low concentrations.

According to the *California Almanac of Emissions and Air Quality* (ARB 2009), the majority of the estimated health risks from TACs can be attributed to relatively few compounds, the most predominant being particulate-exhaust emissions from diesel-fueled engines (diesel PM). Diesel PM differs from other TACs in that it is not a single substance, but rather a complex mixture of hundreds of substances. Although diesel PM is emitted by diesel-fueled internal combustion engines, the composition of the emissions varies depending on engine type, operating conditions, fuel composition, lubricating oil, and whether an emissions control system is being used. Unlike some TACs, no ambient monitoring data are available for diesel PM because no routine measurement method currently exists. However, ARB has made preliminary concentration estimates based on a PM exposure method. This method uses the ARB emissions inventory's PM_{10} database, ambient PM_{10} monitoring data, and the results

from several studies to estimate concentrations of diesel PM. In addition to diesel PM, the TACs for which data are available that pose the greatest existing ambient risk in California are benzene, 1,3-butadiene, acetaldehyde, carbon tetrachloride, hexavalent chromium, paradichlorobenzene, formaldehyde, methylene chloride, and perchloroethylene.

Diesel PM poses the greatest health risk among these 10 TACs mentioned. Since 1990, the health risk associated with diesel PM has been in California has reduced by 52 percent. Overall, levels of most TACs, except paradichlorobenzene and formaldehyde, have decreased since 1990 (ARB 2009: Chapter 5).

Canada

Canadian Ambient Air Quality Standards are health-based air quality objectives for pollutant concentrations in outdoor air. Under the Air Quality Management System, Environment Canada and Health Canada established air quality standards for fine particulate matter and ground-level ozone, two pollutants of concern to human health and the major components of smog. While the Canadian Ambient Air Quality Standards (CAAQS) for fine particulate matter and ozone are set at lower (more stringent) levels than the National Ambient Air Quality Standards (NAAQS) in the United States, direct comparisons are difficult as both countries have significantly different air quality, legislative and regulatory frameworks. The United States has approximately 10 times the population in less geographic space, with corresponding pressures on air quality. Additionally, under the American *Clean Air Act*, penalties can be levied on states where the NAAQS are not being met. Under the *Canadian Environmental Protection Act, 1999,* the CAAQS are voluntary objectives.

Biological Resources

United States

The United States is comprised of many different biological provinces, or biomes, including tundras, coniferous forests, deciduous forests, rain forests, grasslands, and deserts. Each biome provides a sanctuary to a diverse variety of biological species. The U.S. Fish and Wildlife Service (USFWS) has listed over 400 animal and 700 plant species as endangered, and approximately 360 species as threatened (USFWS 2016).

California

The state's geography and topography have created distinct local climates ranging from high rainfall in northwestern mountains to the driest place in North America, Death Valley. North to south, the state extends for almost 800 miles, bridging the temperate rainforests in the Pacific Northwest and the subtropical arid deserts of Mexico. Many parts of the state experience Mediterranean weather patterns, with cool, wet winters and hot, dry summers. Summer rain is indicative of the eastern mountains and deserts, driven by the western margin of the North American monsoon. Along the northern coast abundant precipitation and ocean air produces foggy, moist conditions. High mountains

have cooler conditions, with a deep winter snow pack in normal climate years. Desert conditions exist in the rain shadow of the mountain ranges (CDFW 2015).

While the state is largely considered to have a Mediterranean climate, it can be further subdivided into six major climate types: Desert, Marine, Cool Interior, Highland, Steppe, and Mediterranean. California deserts, such as the Mojave, are typified by a wide range of elevation with more rain and snow in the high ranges, and hot, dry conditions in valleys. Cool Interior and Highland climates can be found on the Modoc Plateau, Klamath, Cascade, and Sierra ranges. Variations in slope, elevation, and aspect of valleys and mountains result in a range of microclimates for habitats and wildlife. For example, the San Joaquin Valley, exhibiting a Mediterranean climate, receives sufficient springtime rain to support grassland habitats, while still remaining hot and relatively dry in summer. Steppe climates include arid, shrub-dominated habitats that can be found in the Owens Valley, east of the Sierra Nevada, and San Diego, located in coastal southern California (CDFW 2015).

The marine climate has profound influence over terrestrial climates, particularly near the coast. Additionally, the state is known for variability in precipitation because of the El Niño-Southern Oscillation (ENSO) and the Pacific Decadal Oscillation (PDO). Oscillations are the cyclical shifting of high and low pressure systems, as evidenced by the wave pattern of the jet stream in the northern hemisphere. The ENSO is the cycle of air pressure systems influenced by the location of warm and cold sea temperatures. El Niño events occur when waters are warmer in the eastern Pacific Ocean, typically resulting in greater precipitation in southern California and less precipitation in northern California, and La Niña events occur when waters are colder in the eastern Pacific resulting in drier than normal conditions in southern California and wetter conditions in northern California during late summer and winter. The warmer ocean temperatures associated with El Niño conditions also result in decreased upwelling in the Pacific Ocean (CDFW 2015).

California has the highest numbers of native and endemic plant species of any state, with approximately 6,500 species, subspecies, and varieties of plants, representing 32 percent of all vascular plants in the United States. Nearly one-third of the state's plant species are endemic, and California has been recognized as one of 34 global hotspots for plant diversity. Within the California Floristic Province, which encompasses the Mediterranean area of Oregon, California, and northwestern Baja, 2,124 of the 3,488 species are endemic, representing a 61 percent rate of endemism. Over 200 species, subspecies, and varieties of native plants are designated as rare, threatened, or endangered by state law, and over 2,000 more plant taxa are considered to be of conservation concern (CDFW 2015).

California has a large number of animal species, representing a substantial proportion of the wildlife species nationwide. The state's diverse natural communities provide a wide variety of habitat conditions for wildlife. The state's wildlife species include approximately 100 reptile species, 75 amphibian species, 650 bird species, and 220

mammal species. Additionally, 48 mammals, 64 birds, 72 amphibians and reptiles, and 20 freshwater fish live in California and nowhere else (CDFW 2015).

California exhibits a wide range of aquatic habitats from the Pacific Ocean to isolated hillside seeps, to desert oases that support both water-dependent species and provide essential seasonal habitat for terrestrial species. Perennial and ephemeral rivers and streams, riparian areas, vernal pools, and coastal wetlands support a diverse array of flora and fauna, including 150 animal and 52 plant species that are designated special-status species. The California Natural Diversity Database identifies 123 different aquatic habitat-types in California, based on fauna. Of these, 78 are stream habitat-types located in seven major drainage systems: Klamath, Sacramento-San Joaquin, North/Central Coast, Lahontan, Death Valley, South Coast, and Colorado River systems. These drainage systems are geologically separated and contain distinctive fishes and invertebrates. California has approximately 70 native resident and anadromous fish species, and 72 percent of the native freshwater fishes in California are either listed, or possible candidates for listing as threatened or endangered, or are extinct (CDFW 2015).

Canada

An estimated 140,000 species live in Canada, only half of which have been identified. Most of the larger organisms (mammals, birds, trees) have been almost completely identified, and it's the smaller creatures that account for most of the unidentified species; over one fifth of all species in Canada are insects. Estimates of how many species of the more obscure groups, such as the nematodes, are little more than guesses. There are 353 species in Canada that have been designated as at risk in some way as of May 2000. Within the list, there are several different categories of risk: special concern, threatened, endangered, extirpated (no longer found in Canada but not extinct), and extinct (McGill 2016).

Cultural Resources

United States and Canada

Cultural resources include archaeological sites of prehistoric or historic origin, built or architectural resources older than 50 years, traditional or ethnographic resources, and fossil deposits of paleontological importance. The United States and Canada have a cultural heritage that dates back to some 25,000-60,000 years ago, when the first known inhabitants of the land that would eventually become the United States crossed the Bering land bridge into Alaska.

All areas within the United States and Canada have the potential for yielding as yet undiscovered archaeological and paleontological resources and undocumented human remains not interred in cemeteries or marked formal burials. These resources have the potential to contribute to our knowledge of the fossil record or local, regional, or national prehistory or history.

Archaeological resources include both prehistoric and historic remains of human activity. Built environment resources include an array of historic buildings, structures, and objects serving as a physical connection to America's past. Traditional or ethnographic cultural resources may include Native American sacred sites and traditional resources of any ethnic community that are important for maintaining the cultural traditions of any group. Paleontological resources, including mineralized, partially mineralized, or unmineralized bones and teeth, soft tissues, shells, wood, leaf impressions, footprints, burrows, and microscopic remains, are more than 5,000 years old and occur mainly in Pleistocene or older sedimentary rock units.

California

California was occupied by different prehistoric cultures dating to at least 12,000 to 13,000 years ago. Evidence for the presence of humans during the Paleoindian Period prior to about 8,000 years ago is relatively sparse and scattered throughout the State; most surface finds of fluted Clovis or Folsom projectile points or archaeological sites left by these highly mobile hunter-gatherers are associated with Pleistocene lakeshores, the Channel Islands, or the central and southern California coast (Rondeau et al 2007). Archaeological evidence from two of the Northern Channel Islands located off the coast from Santa Barbara indicates the islands were colonized by Paleoindian peoples at least 12,000 years ago, likely via seaworthy boats (Erlandson et al 2007). By 10,000 years ago, inhabitants of this coastal area were using fishhooks, weaving cordage and basketry, hunting marine mammals and sea birds, and producing ornamental shell beads for exchange with people living in the interior of the State (Erlandson et al 2007). This is the best record of early maritime activity in the Americas, and combined with the fluted points, indicates California was colonized by both land and sea during the Paleoindian period (Jones and Klar 2007).

With climate changes between 10,000 and 7,000 years ago at the end of the Pleistocene and into the early Holocene, Lower Archaic peoples adjusted to the drying of pluvial lakes, rise in sea level, and substantial alterations in vegetation communities. Approximately 6,000 years ago, vegetation communities similar to those of the present were established in the majority of the state, while the changes in sea level also affected the availability of estuarine resources (Jones and Klar 2007). The archaeological record indicates subsistence patterns during the Lower Archaic and subsequent Middle Archaic Period shifted to an increased emphasis on plant resources, as evidenced by an abundance of milling implements in archaeological sites dating between 8,000 and 3,000 years ago.

Approximately 3,000 years ago, during the Upper Archaic and Late Prehistoric Periods, the complexity of the prehistoric archaeological record reflects increases in specialized adaptations to locally available resources such as acorns and salmon, in permanently occupied settlements, and in the expansion of regional populations and trade networks (Moratto 1984; Jones and Klar 2007). During the Upper Archaic, marine shell beads and obsidian continue to be the hallmark of long-distance trade and exchange networks developed during the preceding period (Hughes and Milliken 2007). Large shell

midden/mounds at coastal and inland sites in central and southern California, for example, attest to the regular reuse of these locales over hundreds of years or more from the Upper Archaic into the Late Prehistoric period. In the San Francisco Bay region alone, over 500 shell mounds were documented in the early 1900s (Moratto 1984).

Changes in the technology used to pursue and process resources are some of the hallmarks of the Late Prehistoric period. These include an increase in the prevalence of mortars and pestles, a diversification in types of watercraft and fishhooks, and the earliest record for the bow and arrow in the State that occurs in both the Mojave Desert and northeast California nearly 2,000 years ago (Jones and Klar 2007). The period also witnessed the beginning of ceramic manufacture in the southeast desert region, southwest Great Basin, and parts of the Central Valley.

During the Late Prehistoric period, the development of social stratification and craft specialization accompanied the increase in sedentism, as indicated by the variety of artifacts, including bone tools, coiled and twined basketry, obsidian tools, marine shell beads, personal ornaments, pipes, and rattles, by the use of clamshell disk beads and strings of dentalium shell as a form of currency, and by variation in burial types and associated grave goods (Moratto 1984; Jones and Klar 2007). Pictographs, painted designs that are likely less than 1,000 years old, and other non-portable rock art created during this period likely had a religious or ceremonial function (Gilreath 2007). Osteological evidence points to intergroup conflict and warfare in some regions during this period (Jones and Klar 2007), and there also appears to have been a decline or disruption in the long-distance trade of obsidian and shell beads approximately 1,200 years ago in parts of the State (Hughes and Milliken 2007).

b) Ethnographic Overview

At the time of European contact, California was the home of approximately 310,000 indigenous peoples with a complex of cultures distinguished by linguistic affiliation and territorial boundaries (Kroeber 1925, Cook 1978, Heizer 1978, Ortiz 1983, d'Azevedo 1986). At least 70 distinct native Californian cultural groups, with even more subgroups, inhabited the vast lands within the State. The groups and subgroups spoke between 74 and 90 languages, plus a large number of dialects (Shipley 1978: p. 80, University of California at Berkeley 2009-2010).

In general, these mainly sedentary, complex hunter-gatherer groups of indigenous Californians shared similar subsistence practices (hunting, fishing, and collecting plant foods), settlement patterns, technology, material culture, social organization, and religious beliefs (Kroeber 1925, Heizer 1978, Ortiz 1983, d'Azevedo 1986). Permanent villages were situated along the coast, interior waterways, and near lakes and wetlands. Population density among these groups varied, depending mainly on availability and dependability of local resources, with the highest density of people in the northwest coast and Santa Barbara Channel areas and the least in the State's desert region (Cook 1976). Networks of foot trails were used to connect groups to hunting or plant gathering

areas, rock quarries, springs or other water sources, villages, ceremonial places, or distant trade networks (Heizer 1978).

The social organization of California's native peoples varied throughout the State, with villages or political units generally organized under a headman who was also the head of a lineage or extended family or achieved the position through wealth (Bean 1978). For some groups, the headman also functioned as the religious ceremonial leader. Influenced by their Northwest Coast neighbors, the differential wealth and power of individuals was the basis of social stratification and prestige between elites and commoners for the Chilula, Hupa, Karok, Tolowa, Wiyot, and Yurok in the northwest corner of the State. Socially complex groups were also located along the southern California coast where differential wealth resulted in hierarchical classes and hereditary village chiefs among the Chumash, Gabrielino, Juaneño, and Luiseño (Bean and Smith 1978, Arnold and Graesch 2004).

At the time of Spanish contact, religious practices among native Californian groups varied, but ethnographers have recognized several major religious systems (Bean and Vane 1978). Many of the groups in the north-central part of the State practiced the *Kuksu* cult, primarily a ceremonial and dance organization, with a powerful shaman as the leader. Log drums, flutes, rattles, and whistles accompanied the elaborate ceremonial dances. The World Renewal cult in the northwestern corner of the State extended as far north as Alaska, entailed a variety of annual rites to prevent natural disasters, maintain natural resources and individual health, and were funded by the wealthy class. The *Toloache* cult was widespread in central and southern California and involved the use of narcotic plant (commonly known as datura or jimsonweed) materials to facilitate the acquisition of power. On the southern coast among Takic-speaking groups, the basis of Gabrielino, Juaneño, and Luiseño religious life was the *Chinigchinich* cult, which appeared to have developed from the Toloache cult. Chinigchinich, the last of a series of heroic mythological figures, gave instruction on laws and institutions, taught people how to dance, and later withdrew into heaven where he rewarded the faithful and punished those who disobeyed his laws. The Chinigchinich religion seems to have been relatively new when the Spanish arrived, and could have been influenced by Christianity.

Trade and exchange networks were a significant part of the economy and social organization among California's Native American groups (Heizer 1978). Obsidian, steatite, beads, acorns, baskets, animal skins, and dried fish were among the variety of traded commodities. Inland groups supplied obsidian from sources along the Sierra Nevada Mountains, in Napa Valley, and in the northeast corner of the State. Coastal groups supplied marine shell beads, ornaments, and marine mammal skins. In addition to trading specific items, clamshell disk beads made from two clam species available on the Pacific coast were widely used as a form of currency (Kroeber 1922). In northwestern California, groups used strings of dentalium shell as currency.

The effect of Spanish settlement and missionization in California marks the beginning of a devastating disruption of native culture and life ways, with forced population movements, loss of land and territory (including traditional hunting and gathering locales), enslavement, and decline in population numbers from disease, malnutrition, starvation, and violence during the historic period (Castillo 1978). In the 1830s, foreign disease epidemics swept through the densely populated Central Valley, adjacent foothills, and North Coast Ranges decimating indigenous population numbers (Cook 1978). By 1850, with their lands, resources and way of life being overrun by the steady influx of non-native people during the Gold Rush, California's native population was reduced to about 100,000; by 1900, there were only 20,000 or less than seven percent of the pre-contact number. Existing reservations were created in California by the federal government beginning in 1858 but encompass only a fraction of native lands.

In 2004, the Native American population in California was estimated at over 383,000 (OPR 2005). Although acknowledged as non-federally recognized California Native American tribes on the contact list maintained by the Native American Heritage Commission (NAHC), many groups continue to await federal tribal status recognition. As of 2005, there were 109 federally recognized tribes within the state, along with dozens of non-federally recognized tribes. Members of these tribes have specific cultural beliefs and traditions with unique connections to areas of California that are their ancestral homelands.

c) Historic Overview

Post-contact history for the State is generally divided into the Spanish period (1769–1822), Mexican period (1822–1848), and American period (1848–present). The establishment of Fort Ross by Alaska-based Russian traders also influenced post-contact history for a short period (1809–1841) in the region north of San Francisco Bay. Although there were brief visits along the Pacific coast by European explorers (Spanish, Russian, and British) between 1529 and 1769 of the territory claimed by Spain, the expeditions did not journey inland.

i) Spanish Period (1769–1822)

Spain's colonization of California began in 1769 with the overland expeditions from San Diego to San Francisco Bay by Lt. Colonel Gaspar de Portolá, and the establishment of a mission and settlement at San Diego. Between 1769 and 1823, the Spanish and the Franciscan Order established a series of 21 missions paralleling the coast along El Camino Real between San Diego and Sonoma (Rolle 1969). Between 1769 and 1782, Spain built four presidios (San Diego, Monterey, San Francisco, and Santa Barbara) to protect the missions, and by 1871 had established two additional pueblos at Los Angeles and San José.

Under Spanish law, large tracts of land, including cattle ranches and farms, fell under the jurisdiction of the missions. Native Americans were removed from their traditional lands, converted to Christianity, concentrated at the missions, and used as labor on the mission farms and ranches (Castillo 1978). Since the mission friars had civil as well as

religious authority over their converts, they held title to lands in trust for indigenous groups. The lands were to be repatriated once the native peoples learned Spanish laws and culture.

ii) Russian Period (1809–1841)

In 1809, Alaska-based Russians started exploring the northern California coast with the goal of hunting otter and seal and feeding their Alaskan colonies. The first Russian settlement was established in 1811–1812 by the Russian–American Fur Company to protect the lucrative marine fur trade and to grow produce for their Alaskan colonies. In 1841, as a result of the decline in local sea otter population and the failure of their agricultural colony, combined with a change in international politics, the Russians withdrew from California (Schuyler 1978).

iii) Mexican Period (1822–1848)

Following independence from Spain in 1822, the economy during the Mexican period depended on the extensive rancho system, carved from the former Franciscan missions and at least 500 land grants awarded in the State's interior to Mexican citizens (Beck and Haase 1974; Staniford 1975). Captain John Sutter, who became a Mexican citizen, received the two largest land grants in the Sacramento Valley. In 1839, Sutter founded the trading and agricultural empire named New Helvetia that was headquartered at Sutter's Fort, near the confluence of the Sacramento and American Rivers in today's City of Sacramento (Hoover et al 2002).

Following adoption of the Secularization Act of 1833, the Mexican government privatized most Franciscan lands, including holdings of their California missions. Although secularization schemes had called for redistribution of lands to Native American neophytes who were responsible for construction of the mission empire, the vast mission lands and livestock holdings were instead redistributed by the Mexican government through several hundred land grants to private, non-indigenous ranchers (Castillo 1978, Hoover et al 2002). Most Native American converts returned to traditional lands that had not yet been colonized or found work with the large cattle ranchos being carved out of the mission lands.

iv) American Period (1848–present)

In 1848, shortly after California became a territory of the United States with the signing of the Treaty of Guadalupe Hidalgo ending Mexican rule, gold was discovered on the American River at Sutter's Mill in Coloma. The resulting Gold Rush era influenced the history of the State, the nation, and the world. Thousands of people flocked to the gold fields in the Mother Lode region that stretches along the western foothills of the Sierra Nevada Mountains, and to the areas where gold was also discovered in other parts of the State, such as the Klamath and Trinity River basins (Caltrans 2008). In 1850, California became the 31st state, largely as a result of the Gold Rush.

d) Paleontological Setting

California's fossil record is exceptionally prolific with abundant specimens representing a diverse range of marine, lacustrine, and terrestrial organisms recovered from Precambrian rocks as old as 1 billion years to as recent as 6,000 year-old Holocene deposits (refer to geologic timescale in **Error! Reference source not found.**Table A1-2). These fossils provide key data for charting the course of the evolution or extinction of a variety of life on the planet, both locally and internationally. Paleontological specimens also provide key evidence for interpreting paleoenvironmental conditions, sequences and timing of sedimentary deposition, and other critical components of the earth's geologic history. Fossils are considered our most significant link to the biological prehistory of the earth (Jefferson 2004).

Table A1-2: Divisions of Geologic Time

Era	Period	Time in Millions of Years Ago (approximately)	Epoch
Cenozoic	Quaternary	< 0.01	Holocene
		2.6	Pleistocene
	Tertiary	5.3	Pliocene
		23	Miocene
		34	Oligocene
		56	Eocene
		65	Paleocene
Mesozoic	Cretaceous	145	
	Jurassic	200	
	Triassic	251	
Paleozoic	Permian	299	
	Carboniferous	359	
	Devonian	416	
	Silurian	444	
	Ordovician	488	
	Cambrian	542	
Precambrian		2,500	
Source: USGS Geologic Names Committee 2010			

Because the majority of the State was underwater until the Tertiary period, marine fossils older than 65 million years are not common and are exposed mainly in the mountains along the border with Nevada and the Klamath Mountains, and Jurassic shales, sandstones, and limestones are exposed along the edges of the Central Valley,

portions of the Coast, Transverse, and Peninsular Ranges, and the Mojave and Colorado Deserts. Some of the oldest fossils in the State, extinct marine vertebrates called conodonts, have been identified at Anza-Borrego Desert SP in Ordovician sediments dating to circa 450 million years ago. Limestone outcrops of Pennsylvanian and Permian in the Providence Mountains SRA contain a variety of marine life, including brachiopods, fusulinids, crinoids, that lived some 300 to 250 million years ago.

Fossils from the Jurassic sedimentary layers in San Joaquin, San Luis Obispo, and Stanislaus counties include ammonites, bivalves, echinoderms and marine reptiles, all of which were common in the coastal waters. Gymnosperms (seed-bearing plants) such as cycads, conifers, and ginkgoes are preserved in terrestrial sediments from this period, evidence that the Jurassic climate was warm and moderately wet. In the great Central Valley, marine rocks record the position of the Cretaceous shoreline as the eroded ancestral Sierra Nevada sediments were deposited east of the rising Coast Ranges and became the rock layers of the Sacramento and San Joaquin valleys. These Cretaceous sedimentary deposits have yielded abundant fossilized remains of plants, bivalves, ammonites, and marine reptiles (Paleontology Portal 2003).

Along coastal southern California where steep coastal mountains plunged into the warm Pacific Ocean an abundance of fossil marine invertebrates, such as ammonites, nautilus, tropical snails and sea stars, have been found in today's coastal and near-coastal deposits from the Cretaceous Period. A rare armored dinosaur fossil dated to about 75 million years ago during the Cretaceous was discovered in San Diego County during a highway project. It is the most complete dinosaur skeleton ever found in California (San Diego Natural History Museum 2010). The lack of fossil remains of the majority of earth's large vertebrates, particularly terrestrial, marine, and flying reptiles (dinosaurs, ichthyosaurs, mosasaurs, pleisosaurs, and pterosaurs), as well as many species of terrestrial plants, after the end of the Cretaceous and the start of the Tertiary periods 65 million years ago (the K-T boundary) attests to their abrupt extinction.

Energy Demand

United States

The major energy sources consumed in the United States are petroleum (oil), natural gas, coal, nuclear energy, and renewable energy. The major user sectors of these energy sources are residential and commercial buildings, industry, transportation, and electric power. The pattern of energy use varies widely by sector (EIA 2016).

Primary energy includes petroleum, natural gas, coal, nuclear energy, and renewable energy. Electricity is a secondary energy source that is generated using these primary forms of energy. For example, coal is a primary energy source that is burned by electric power plants to generate electricity, which is a secondary source of energy. Primary energy is used in residential and commercial buildings, in transportation, by industry, and by electricity generating facilities. The electric power sector is the largest user of

primary energy, followed by the transportation sector. The electric power sector uses primary energy to generate electricity. Nearly all electricity is used in buildings and by industry (EIA 2016).

Renewable energy plays an important role in reducing greenhouse gas emissions. When renewable energy sources are used, the demand for fossil fuels is reduced. Unlike fossil fuels, non-biomass renewable sources of energy (hydropower, geothermal, wind, and solar) do not directly emit greenhouse gases. More than half of United States renewable energy use is for producing electricity. Biomass (wood and waste) is the second most commonly used renewable energy source. Biomass is used to produce heat and steam for industrial purposes, and it is also used for space heating. Biomass also includes biofuels like ethanol and biodiesel, which are used for transportation (EIA 2015).

The production and use of biofuels and nonhydroelectric renewable energy sources doubled from 2000 to 2014, mainly because of state and federal government mandates and incentives for renewable energy. The use of renewable fuels is expected to continue to grow over the next 25 years. The U.S. Energy Information Administration (EIA) projects that the United States will use nonrenewable fuels to meet most of its energy needs through 2040 (EIA 2015).

California

Excluding Federal offshore areas, California ranks third in the Nation in crude oil production in 2014. California ranks third in the Nation in conventional hydroelectric generation, second in net electricity generation from other renewable energy resources, and first as a producer of electricity from geothermal energy (in 2012). In 2012, California, left with one remaining nuclear power plant after the San Onofre Nuclear Generating Station was permanently shut down in 2012, ranked fourteenth in net electricity generation from nuclear power plants and eighth in nuclear net summer capacity. Average site electricity consumption in California homes is among the lowest in the nation (6.9 megawatt hours per year), according to the Energy Information Administration's (U.S. EIA's) Residential Energy Consumption Survey last conducted in 2009. In 2012, California's per capita energy consumption ranked 49th in the Nation, due in part to its mild climate and energy efficiency programs (U.S. EIA 2013).

In 2013, California's in-state electricity generation sources consisted of: 44.3 percent natural gas, 18.8 percent renewable sources, 8.8 percent nuclear, 7.8 percent large hydropower, and 7.8 percent from coal. Approximately 63 percent of total electricity generation was from in-state sources, with the remaining electricity coming from out-of-state imports from the Pacific Northwest (12 percent) and the Southwest (21 percent) (CEC 2014a).

In 2012, Californians consumed 274,449 gigawatt hours (GWh) of electricity and 12,897 million therms of natural gas, primarily in the commercial, residential, and

industrial sectors. A California Energy Commission (CEC) staff forecast of future energy demand shows that electricity consumption will grow by between 0.79 and 1.56 percent per year between 2014 and 2024; and natural gas consumption is expected to reach up to 12,801 million therms by 2024 for an annual average growth rate of up to 0.02 percent (CEC 2014b).

The CEC is the State's primary energy policy and planning agency. Created by the Legislature in 1974, and located in Sacramento, six basic responsibilities guide the CEC as it sets state energy policy: forecasting future energy needs; promoting energy efficiency and conservation by setting the State's appliance and building efficiency standards; supporting public interest energy research that advances energy science and technology through research, development and demonstration programs; developing renewable energy resources and alternative renewable energy technologies for buildings, industry and transportation; licensing thermal power plants 50 megawatts or larger; and planning for and directing state response to energy emergencies.

The CPUC also plays a key role in regulating investor-owned electric, natural gas, telecommunications, water, railroad, rail transit, and passenger transportation companies. The CPUC regulates investor-owned electric and natural gas utilities operating in California, including Pacific Gas and Electric Company, Southern California Edison, San Diego Gas and Electric Company, and Southern California Gas Company.

Canada

Canada is a world leader in hydro-electricity, which accounts for 59% of the country's electricity supply. Other sources include coal, uranium, natural gas, petroleum and non-hydro renewable sources. Canada is the world's fifth-largest producer and fourth-largest exporter of natural gas. As part of a fully integrated and continental natural gas market, Canada moves its natural gas resources seamlessly across provincial and national borders, from supply basins to demand centers (NRCAN 2016b).

Geology, Soils, and Mineral Resources

United States

The United States has a diverse, complex and seismically active geology that includes a vast array of landforms. Soils are as diverse as America's geology, and are described and characterized individually and collectively with other soils, and their various compatible uses in soil surveys published by the U.S. Department of Agriculture. Soils are fundamental and largely non-renewable resources that are the basis for high-level sustained yields of agricultural commodities, forest products, and provide support to the wide variety of ecological communities throughout the State.

The geology of the United States is very complex and can be divided into roughly five physiographic provinces: the American cordillera, the Canadian shield, the stable platform, the coastal plain, and the Appalachian orogenic belt. In Alaska, the geology is

typical of the cordillera, whereas in Hawaii the major islands consist of Neogene volcanic erupted over a hotspot.

California

The state's topography is highly varied and includes 1,340 miles of seacoast, as well as high mountains, inland flat valleys, and deserts. Elevations in California range from 282 feet below sea level in Death Valley to 14,494 feet at the peak of Mount Whitney. The mean elevation of California is approximately 2,900 feet. The climate of California is as highly varied as its topography. Depending on elevation, proximity to the coast, and altitude, climate types include temperate oceanic, highland, sub-arctic, Mediterranean, steppe, and desert (USGS 1995). The average annual precipitation across all California climate types is approximately 23 inches and approximately 75 percent of the state's annual precipitation falls between November and March, primarily in the form of rain, with the exception of high mountain elevations (DWR 2003). Average annual precipitation ranges from more than 100 inches in the mountainous areas within the Smith River in Del Norte County to less than 2 inches in Death Valley, illustrating the extreme differences in precipitation levels within the State (Mount 1995). Overall, northern California is wetter than southern California with the majority of the State's annual precipitation occurring in the northern coastal region.

a) Geology

Plate tectonics and climate have played major roles in forming California's dramatic landscape. California is located on the active western boundary of the North American continental plate in contact with the oceanic Pacific Plate and the Gorda Plate north of the Mendocino Triple Junction. The dynamic interactions between these three plates and California's climate are responsible for the unique topographic characteristics of California, including rugged mountain ranges, long and wide flat valleys, and dramatic coastlines. Tectonics and climate also have a large effect on the occurrence natural environmental hazards, such as earthquakes, landslides, and volcanic formations.

b) Landslides

Landsliding or mass wasting is a common erosional process in California and has played an integral part in shaping the State's landscape. Typically, landslides occur in mountainous regions of the State, but they can also occur in areas of low relief, including coastal bluffs, along river and stream banks, and inland desert areas. Landsliding is the gravity-driven downhill mass movement of soil, rock, or both and can vary considerably in size, style and rate of movement, and type depending on the climate of a region, the steepness of slopes, rock type and soil depth, and moisture regime (Harden 1997).

c) Earthquakes

Earthquakes are a common and unpredictable occurrence in California. The tectonic development of California began millions of years ago by a shift in plate tectonics that converted the passive margin of the North American plate into an active margin of

compressional and translational tectonic regimes. This shift in plate tectonics continues to make California one of the most geomorphically diverse, active, and picturesque locations in the United States While some areas of California are more prone to earthquakes, such as northern, central, and southern coastal areas of California, all areas of California are prone to the effects of ground shaking due to earthquakes. While scientists have made substantial progress in mapping earthquake faults where earthquakes are likely to occur, and predicting the potential magnitude of an earthquake in any particular region, they have been unable to precisely predict where or when an earthquake will occur and what its magnitude will be.

d) Tsunamis

Coastal communities around the circum Pacific have long been prone to the destructive effects of tsunamis. Tsunamis are a series of long-period, high-magnitude ocean waves that are created when an outside force displaces large volumes of water. Throughout time, major subduction zone earthquakes in both the Northern and Southern Hemispheres have moved the Earth's crust at the ocean bottom sending vast amounts of waters into motion and spreading tsunami waves throughout the Pacific Ocean.

Tsunamis can also occur from subareal and submarine landslides that displace large volumes of water. Subaeral landslide-generated tsunamis can be caused by seismically generated landslides, rock falls, rock avalanches, and eruption or collapse of island or coastal volcanoes. Submarine landslide-generated tsunamis are typically caused by major earthquakes or coastal volcanic activity. In contrast to a seismically generated tsunami, seismic seiches are standing waves that are caused by seismic waves traveling through a closed (lake) or semi-enclosed (bay) body of water. Due to the long-period seismic waves that originate after an earthquake, seiches can be observed several thousand miles away from the origin of the earthquakes. Small bodies of water, including lakes and ponds, are especially vulnerable to seismic seiches.

e) Volcanoes

A volcano is an opening in the Earth's crust through which magma escapes to the surface where it is extruded as lava. Volcanism may be spectacular, involving great fountains of molten rock, or tremendous explosions that are caused by the build-up of gases within the volcano (Ritchie and Gates 2001). Some of the most active volcanic areas in California are located within the Cascade Range - a volcanic chain that is a result of compressional tectonics along the Cascadia subduction zone.

f) Active Faults

A fault is defined as a fracture or zone of closely associated fractures along rocks that on one side have been displaced with respect to those on the other side. Most faults are the result of repeated displacement that may have taken place suddenly or by slow creep. A fault is distinguished from fractures or shears caused by landsliding or other gravity-induced surficial failures. A fault zone is a zone of related faults that commonly are braided and subparallel, but may be branching and divergent. A fault zone has

significant width (with respect to the scale of the fault being considered, portrayed, or investigated), ranging from a few feet to several miles (Bryant and Hart 2007).

In the State of California earthquake faults have been designated as being active through a process that has been described by the 1972 Alquist-Priolo Earthquake Fault Zoning Act. An active fault is defined by the State as one that has "had surface displacement within Holocene time (about the last 11,000 years)." This definition does not, of course, mean that faults lacking evidence for surface displacement within Holocene time are necessarily inactive. A fault may be presumed to be inactive based on satisfactory geologic evidence; however, the evidence necessary to prove inactivity sometimes is difficult to obtain and locally may not exist.

The CGS classifies the regional significance of mineral resources in accordance with the California Surface Mining and Reclamation Act of 1975 and assists in the designation of land containing significant aggregate resources. Mineral Resources Zones (MRZs) have been designated to indicate the significance of mineral deposits. The MRZ categories follow:

> **MRZ-1:** Areas where adequate information indicates that no significant mineral deposits are present or where it is judged that little likelihood exists for their presence.
>
> **MRZ-2:** Areas where adequate information indicates significant mineral deposits are present, or where it is judged that a high likelihood exists for their presence.
>
> **MRZ-3:** Areas containing mineral deposits the significance of which cannot be evaluated from available data.
>
> **MRZ-4:** Areas where available information is inadequate for assignment to any other MRZ.

California ranks as 7th in the United States for non-fuel mineral production, accounting for approximately 3.9 percent of the nation's total. In 2011, there were approximately 700 active mineral mines that produced: sand and gravel, boron, Portland cement, crushed stone, gold, masonry cement, clays, gemstones, gypsum, salt, silver, and other minerals (Clinkenbeard and Smith 2013).

Canada

Canada's landscape is very diversified and comprises several distinctive areas, called physiographic regions, each of which has its own topography and geology. The physical geography of Canada comprises two great parts: the Shield and the Borderlands. The Shield consists of a core of old, massive, Precambrian crystalline rocks. The Borderlands areas are formed by younger rocks and surround the Shield like two rings. The inner ring comprises a chain of lowlands, plains and plateaus of generally flat-lying sedimentary rocks. The outer ring consists of discontinuous areas of mountains and

plateaus in which the younger rocks are deformed. Each of these areas is divided into regions, each of which comprises many smaller subdivisions that are distinctive based on their topography and geology (NRCAN 2016c).

Greenhouse Gases

United States and Canada

GHGs retain heat in the atmosphere, contributing to global warming. The proposed cap-and-trade regulation would establish a limit (cap) on the emission of GHG expressed in $MMTCO_2e$. Gases subject to the cap are CO_2, N_2O, CH_4, SF_6, HFCs, PFCs, and NF_3. $MMTCO_2e$ is calculated based on GWP. GWP is a scale that normalizes other GHGs based on the heat retention properties of CO_2, which is assigned a value of 1.0. The GWP and atmospheric lifetimes of the GHG subject to the cap-and-trade regulation are presented below (Table A1-3).

Table A1-3

GHG	GWP (100 year, SAR)	Atmospheric Lifetime (years)
Carbon Dioxide (CO_2)	1.0	Variable
Nitrous Oxide (N_2O)	310	120
Methane (CH_4)	21	12
Sulfur Hexafluoride (SF_6)	23,900	3,200
Hydrofluorocarbons (HFCs)	Each HFC has its own GWP characteristics, ranging from 140 years (HFC-152a) to 11,700 years (HFC-23).	Most HFCs have atmospheric lifetimes of less than 15 years. The atmospheric lifetime of HFC-152a is about 1-year while the lifetime of HFC-23 is 260 years.
Perfluorocarbons (PFCs)	The two most prolific anthropogenic PFCs are CF4 (tetrafluoromethane) and C2F6 (hexafluoroethane). The GWP of CF4 is 6,500 and the GWP of C2F6 is 9,200.	CF4 has an atmospheric lifetime of 50,000 years. C2F6 has an atmospheric lifetime of 10,000 years.
Nitrogen Trifluoride (NF_3)*	17,200*	740*

*Nitrogen Trifluoride is not included in the UNFCCC SAR

b) Attributing Climate Change—The Physical Scientific Basis

Climate change is a long-term shift in the climate of a specific location, region or planet. The shift is measured by changes in features associated with average weather, such as temperature, wind patterns, and precipitation. According to the Intergovernmental Panel on Climate Change (IPCC), a scientific body established by the World Meteorological Organization (WMO) and by the United Nations Environment Programme (UNEP), available scientific evidence supports the conclusion that most of the increased average global temperatures since the mid-20th century is very likely due to human-induced increases in greenhouse gas (GHG) concentrations. GHGs, which are emitted from both natural and anthropogenic sources, include water vapor, carbon dioxide, methane, nitrous oxide, halocarbons, and ozone. These gases play a role in the "greenhouse effect" that helps regulate the temperature of the earth.

The current post-industrial warming trend differs alarmingly from past changes in the Earth's climate because GHG emissions are higher and warming is occurring faster than at any other time on record within the past 650,000 years. Historical long-term as well as decadal and inter-annual fluctuations in the Earth's climate resulted from natural processes such as plate tectonics, the Earth's rotational orbit in space, solar radiation variability, and volcanism. The current trend derives from an added factor: human activities, which have greatly intensified the natural greenhouse effect, causing global warming. GHG emissions from human activities that contribute to climate change include the burning of fossil fuels (such as coal, oil and natural gas), cutting down trees (deforestation) and developing land (land-use changes). The burning of fossil fuels emits GHGs into the atmosphere, while deforestation and land-use changes remove trees and other kinds of vegetation that store ("sequester") carbon dioxide. Emissions of GHGs due to human activities have increased globally since pre-industrial times, with an increase of 70 percent between 1970 and 2004 (IPCC 2007).

A growing recognition of the wide-ranging impacts of climate change has fueled efforts over the past several years to reduce GHG emissions. In 1997, the Kyoto Protocol set legally binding emissions targets for industrialized countries, and created innovative mechanisms to assist these countries in meeting these targets. The Kyoto Protocol took effect in 2004, after 55 parties to the Convention had ratified it (The UN Climate Change Convention and the Kyoto Protocol). Six major GHGs have been the focus of efforts to reduce emissions and are included in AB 32: carbon dioxide (CO_2), methane, nitrous oxide (N_2O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs) and sulfur hexafluoride (SF_6). They are regulated under the Kyoto Protocol. Nitrogen trifluoride (NF_3) was later added to the list of important GHGs to reduce and codified in California statute.

The "global warming potential" (GWP) metric is used to convert all GHGs into "CO_2-equivalent" (CO_2e) units for a specific time frame. GWPs from the IPCC fourth assessment report over a 100-year warming horizon are used as the national and international standard in GHG inventory development; however, GWPs over a 20-year

time horizon are also available and can be more applicable for consideration of short-lived climate pollutants. Each gas's GWP is defined relative to CO_2 for the given time frame. For example, N_2O's 100-yr GWP is 298, meaning a unit mass of N_2O warms the atmosphere 298 times more than a unit mass of CO_2. SF_6 and PFCs have extremely long atmospheric lifetimes, resulting in their essentially irreversible accumulation in the atmosphere once emitted. However, in terms of quantity of emissions, CO_2 dominates world and United States GHG emissions.

Because the major GHGs have longer lives, they build up in the atmosphere so that past, present and future emissions ultimately contribute to total atmospheric concentrations. Thus, while reducing emissions of conventional air pollutants decreases their concentrations in the atmosphere in a relatively short time, atmospheric concentrations of the major GHGs can only be gradually reduced over years and decades. More specifically, the rate of emission of CO_2 currently greatly exceeds its rate of removal, and the slow and incomplete removal implies that small to moderate reductions in its emissions would not result in stabilization of CO_2 concentrations, but rather would only reduce the rate of its growth in coming decades. Many of the same activities that emit conventional air pollutants also emit GHGs (e.g., the burning of fossil fuels to produce electricity, heat or drive engines and the burning of biomass). Some conventional air pollutants also have greenhouse effects; for example, soot/black carbon and tropospheric ozone (see Short-Lived Climate Pollutants below).

c) Attributing Climate Change—Greenhouse Gas Emission Sources

Emissions of GHGs contributing to global climate change are attributable in large part to human activities associated with the transportation, electricity, industrial/manufacturing, utility, residential, commercial and agricultural sectors. In California, the transportation sector is the largest emitter of GHGs, followed by electricity generation. Anthropogenic emissions of CO_2 are byproducts of fossil fuel combustion. Methane, a potent GHG, is primarily emitted by livestock and landfills with a smaller contribution from fugitive emissions from oil and gas operations and natural gas transmission and distribution. N_2O is also largely attributable to agricultural practices, primarily from nitrogen-based fertilizer and manure application to soils.

CO_2 equivalent (CO_2e) is a measurement that uses global warming potentials (GWP) to account for the fact that different GHGs have different potential to retain infrared radiation in the atmosphere and contribute to the greenhouse effect. The GWP is dependent on the lifetime, or persistence, of the gas molecule in the atmosphere and the specific infrared absorption pattern and strength. For example, the IPCC fourth assessment report 100-yr GWP for methane used in the U.S. EPA and California GHG inventory defines 1 ton of methane as equivalent to 25 tons of CO_2 (IPCC 2013). Therefore, methane is a much more potent GHG than CO_2. Expressing emissions in CO_2e takes the contributions of all GHG emissions to the greenhouse effect and converts them to a single unit equivalent to the effect that would occur if only CO_2 were being emitted.

The California GHG inventory compiles statewide anthropogenic GHG emissions and sinks. It includes estimates for CO_2, methane, N_2O, SF_6, NF_3, HFCs, and PFCs. The current inventory covers years 2000 to 2013 (available at http://www.arb.ca.gov/cc/inventory/data/data.htm).

In 2013, total GHG emissions decreased by 1.5 million metric tons of CO2equivalents MMTCO2e) from 2012, representing an overall decrease of 7% since peak levels in 2004. During the 2000 to 2013 period, per capita GHG emissions in California have continued to drop from a peak in 2001 of 14.0 tonnes per person to 12.0 tonnes per person in 2013; a 14% decrease. Overall trends in the inventory also demonstrate that the carbon intensity of California's economy (the amount of carbon pollution per million dollars of GDP) is declining; representing a 23% decline since the 2001 peak (ARB 2015b).

e) Adaptation to Climate Change

According to the IPCC, which was established in 1988 by the World Meteorological Organization and the United Nations Environment Programme, global average temperature is expected to increase by 3–7°F by the end of the century, depending on future GHG emission scenarios (IPCC 2007). Resource areas other than air quality and global average temperature could be indirectly affected by the accumulation of GHG emissions. For example, an increase in the global average temperature is expected to result in a decreased volume of precipitation falling as snow in California and an overall reduction in snowpack in the Sierra Nevada. Snowpack in the Sierra Nevada provides both water supply (runoff) and storage (within the snowpack before melting), which is a major source of supply for the state.

According to the CEC (2012), statewide average temperatures increased by about 1.7 degrees Fahrenheit from 1895 to 2011. Throughout the past century precipitation (i.e., rain and snow) has followed the expected pattern of a largely Mediterranean climate with wet winters and dry summers, and considerable variability from year to year. No consistent trend in the overall amount of precipitation has been detected, except that a larger proportion of total precipitation is falling as rain instead of snow. In addition, during the last 35 years, the Sierra Nevada range has witnessed both the wettest and the driest years on record of more than 100 years. While intermittent droughts have been a common feature of the State's climate, evidence from tree rings and other indicators reveal that over the past 1,500 years, California has experienced dry spells that persisted for several years or even decades (CEC 2012).

The effects of global climate change could lead to a variety of secondary effects to public health, water supply, energy supply, sea level, wildfire risks, and ecosystems. Recent data, climate projections, topographic, demographic, and land use information have led to the findings that:

The state's electricity system is more vulnerable than was previously understood.

The Sacramento-San Joaquin Delta is sinking, putting levees at growing risk.

Wind and waves, in addition to faster rising seas, will worsen coastal flooding.

Animals and plants need connected "migration corridors" to allow them to move to more suitable habitats to avoid serious impacts.

Native freshwater fish are particularly threatened by climate change.

Minority and low-income communities face the greatest risks from climate change.

There are effective ways to prepare for and manage climate change risks, but local governments face many barriers to adapting to climate change; these can be addressed so that California can continue to prosper.

At the same time, the State has recognized the need to adapt to climate change impacts that can no longer be avoided. In 2014, the CA Natural Resources Agency released the Safeguarding California Plan, which serves as an update to the 2009 California Climate Adaptation Strategy. The many adaptation planning efforts underway in virtually every State agency, in regional and local communities such as Chula Vista, San Diego, Los Angeles, Santa Barbara, Santa Cruz, San Francisco, Hayward, Marin County, Sacramento, and others, as well as in private businesses suggest that CEOs, elected officials, planners, and resource managers understand the reality that California and the world is facing.

In fact, the latest climate science makes clear that State, national and global efforts to mitigate climate change must be accelerated to limit global warming to levels that do not endanger basic life-support systems and human well-being. Success in mitigation will keep climate change within the bounds that allow ecosystems and society to adapt without major disruptions. Further advances in integrated climate change science can inform California's and the world's climate choices and help ensure a resilient future.

California

California has four main climatic regions. Mild summers and winters prevail in central coastal areas, where temperatures are more equable than virtually anywhere else in the United States For example, differences between average summer and winter temperatures between San Francisco and Monterey for example are seldom more than 10°F (6°C). During the summer there are heavy fogs in San Francisco and all along the coast. Mountainous regions are characterized by milder summers and colder winters, with markedly low temperatures at high elevations. The Central Valley has hot summers and cool winters, while the Imperial Valley and eastern deserts are marked by very hot, dry summers, with temperatures frequently exceeding 100°F (38°C).

Average annual temperatures for the state range from 47°F (8°C) in the Sierra Nevada to 73°F (23°C) in the Imperial Valley. The highest temperature ever recorded in the United States was 134°F (57°C), registered in Death Valley on 10 July 1913. Death Valley has the hottest average summer temperature in the Western Hemisphere, at 98°F (37°C). The state's lowest temperature was -45°F (-43°C), recorded on 20 January 1937 at Boca, near the Nevada border.

Among the major population centers, Los Angeles has an average annual temperature of 63°F (17°C), with an average January minimum of 48°F (9°C) and an average July maximum of 75°F (24°C). San Francisco has an annual average of 57°F (14°C), with a January average minimum of 42°F (6°C) and a July average maximum of 72°F (22°C). The annual average in San Diego is 64°F (18°C), the January average minimum 49°F (9°C), and the July average maximum 76°F (24°C). Sacramento's annual average temperature is 61°F (16°C), with January minimums averaging 38°F (3°C) and July maximums of 93°F (34°C).

Annual precipitation varies from only 2 in (5 cm) in the Imperial Valley to 68 in (173 cm) at Blue Canyon, near Lake Tahoe. San Francisco had an average annual precipitation (1971–2000) of 20 in (51 cm), Sacramento 17.9 in (45.5 cm), Los Angeles 13.2 in (33.5 cm), and San Diego 10.8 in (27.4 cm). The largest one-month snowfall ever recorded in the United States, 390 in (991 cm), fell in Alpine County in January 1911. Snow averages between 300 and 400 in (760 to 1,020 cm) annually in the high elevations of the Sierra Nevada, but is rare in the Central Valley and coastal lowlands.

Sacramento has the greatest percentage (73 percent) of possible annual sunshine among the State's largest cities; Los Angeles has 72 percent and San Francisco 71 percent. San Francisco is the windiest, with an average annual wind speed of 11 mph (18 km/hr). Tropical rainstorms occur often in California during the winter.

Hazards and Hazardous Materials

United States and Canada

Hazardous materials are substances with physical properties that could pose a substantial present or future hazard to human health or the environment when improperly handled, disposed, or otherwise managed. Hazardous materials are grouped into four categories based on their properties: toxic (causes human health effects), ignitable (has the ability to burn), corrosive (causes severe burns or damage to materials) and reactive (causes explosions or generates toxic gases). A hazardous waste is any hazardous material that cannot be safely disposed in the trash or poured down sinks and storm drains. This includes items, such as fuels, industrial solvents and chemicals, process water, and spent materials (e.g., foams).

California

California Health and Safety Code (Section 25501) defines "hazardous materials" as any material that, because of its quantity, concentration, or physical or chemical

characteristics, poses a significant present or potential hazard to human health and safety or to the environment if released into the workplace or the environment. Hazardous materials are grouped into four categories based on their characteristics: toxic (causes human health effects), ignitable (has the ability to burn), corrosive (causes severe burns or damage to materials) and reactive (causes explosions or generates toxic gases). A hazardous waste is any hazardous material that is finished with its intended use and is discarded. This may include items, such as spent fuels, industrial solvents and chemicals, process water, and other spent materials (i.e., some types of batteries and fuel cells). California's hazardous waste regulations provides the following means to determine whether or not a waste is hazardous: (1) a list of criteria (toxic, ignitable, corrosive and reactive) that a waste may exhibit; (2) a list of those wastes that are subject to regulation; and (3) a list of chemical names and common names that are presumed to be hazardous in California.

Hydrology and Water Quality

United States and Canada

Surface waters occur as streams, lakes, ponds, coastal waters, lagoons, estuaries, floodplains, dry lakes, desert washes, wetlands and other collection sites. Water bodies modified or developed by man, including reservoirs and aqueducts, are also considered surface waters. Surface water resources are very diverse throughout the state, due to the high variance in tectonics, topography, geology/soils, climate, precipitation, and hydrologic conditions.

California

Land uses have a great effect on surface water and groundwater water quality in the State of California. Water quality degradation of surface waters occurs through nonpoint- and point- source discharges of pollutants. Nonpoint source pollution is defined as not having a discrete or discernible source and is generated from land runoff, precipitation, atmospheric deposition, seepage, and hydrologic modification (U.S. EPA 1993). Nonpoint-source pollution includes runoff containing pesticides, insecticides, and herbicides from agricultural areas and residential areas; acid drainage from inactive mines; bacteria and nutrients from septic systems and livestock; VOCs and toxic chemicals from urban runoff and industrial discharges; sediment from timber harvesting, poor road construction, improperly managed construction sites, and agricultural areas; and atmospheric deposition and hydromodification. In comparison, point-source pollution is generated from identifiable, confined, and discrete sources, such as a smokestack, sewer, pipe or culvert, or ditch. These pollutant sources are regulated by the U.S. EPA and SWRCB through RWQCB. Many of the pollutants discharged from point-sources are the same as for nonpoint-sources, including municipal (bacteria and nutrients), agricultural (pesticides, herbicides, and insecticides), and industrial pollutants (VOCs and other toxic effluent).

Overall, California has the most diverse range of watershed conditions in the United States, with varied climatic regimes ranging from Mediterranean climates with

temperate rainforests in the north coast region to desert climates containing dry desert washes and dry lakes in the southern central region. The average annual runoff for the State is 71 million acre-feet (DWR 2003). The state has more than 60 major stream drainages and more than 1,000 smaller, but significant drainages that drain coastal mountains and inland mountainous areas. High snowpack levels and resultant spring snowmelt yield high surface runoff and peak discharge in the Sierra Nevada and Cascade Mountains that feed surface flows, fill reservoirs and recharge groundwater. Federal, state and local engineered water projects, aqueducts, canals, and reservoirs serve as the primary conduits of surface water sources to areas that have limited surface water resources. Most of the surface water storage is transported for agricultural, urban, and rural residential needs to the San Francisco Bay Area and to cities and areas extending to southern coastal California. Surface water is also transported to southern inland areas, including Owens Valley, Imperial Valley, and Central Valley areas.

The majority of runoff from snowmelt and rainfall flows down mountain streams into low gradient valleys and either percolates into the ground or is discharged to the sea. This percolating flow is stored in alluvial groundwater basins that cover approximately 40 percent of the geographic extent of the state (DWR 2003). Groundwater recharge occurs more readily in areas underlain by coarse sediments, primarily in mountain base alluvial fan settings. As a result, the majority of California's groundwater basins are located in broad alluvial valleys flanking mountain ranges, such as the Cascade Range, Coast Ranges, Transverse Ranges, and the Sierra Nevada.

There are 250 major groundwater basins that serve approximately 30 percent of California's urban, agricultural and industrial water needs, especially in southern portion of San Francisco Bay, the Central Valley, greater Los Angeles area, and inland desert areas where surface water is limited. On average, more than 15 million acre-feet of groundwater are extracted each year in the State, of which more than 50 percent is extracted from 36 groundwater basins in the Central Valley.

Land Use and Planning

United States and Canada

The manner in which physical landscapes are used or developed is commonly referred to as land use. Public agencies are the primary entities that determine the types of land use changes that can occur for specific purposes within their authority or jurisdiction. In most states, land uses decisions are made by local governments.

California

In California, the State Planning and Zoning Law (California Government Code section 65000 et seq.) provides the primary legal framework that cities and counties must follow in land use planning and controls. Planned land uses are designated in the city or county general plan, which serves as the comprehensive master plan for the community. Also, city and county land use and other related resource policies are

defined in the General Plan. The primary land use regulatory tool provided by the California Planning and Zoning Law is the zoning ordinance adopted by each city and county. Planning and Zoning Law requirements are discussed in the regulatory setting below.

When approving land use development, cities and counties must comply with CEQA, which requires that they consider the significant environmental impacts of their actions and the adoption of all feasible mitigation measures to substantially reduce significant impacts, in the event a project causes significant or potentially significant effects on the environment. In some cases, building permits may be ministerial, and therefore exempt from CEQA, but most land use development approval actions by cities and counties require CEQA compliance.

Land use decisions in California are also be governed by state agencies such as the California Coastal Commission, California State Lands Commission, California Department of Parks and Recreation, and others, where the state has land ownership or permitting authority with respect to natural resources or other state interests.

Noise

United States, Canada, and California

1. Acoustic Fundamentals

Acoustics is the scientific study that evaluates perception, propagation, absorption, and reflection of sound waves. Sound is a mechanical form of radiant energy, transmitted by a pressure wave through a solid, liquid, or gaseous medium. Sound that is loud, disagreeable, unexpected, or unwanted is generally defined as noise; consequently, the perception of sound is subjective in nature, and can vary substantially from person to person.

A sound wave is initiated in a medium by a vibrating object (e.g., vocal chords, the string of a guitar, the diaphragm of a radio speaker). The wave consists of minute variations in pressure, oscillating above and below the ambient atmospheric pressure. The number of pressure variation cycles occurring per second is referred to as the frequency of the sound wave and is expressed in hertz.

Directly measuring sound pressure fluctuations would require the use of a very large and cumbersome range of numbers. To avoid this and have a more useable numbering system, the decibel (dB) scale was introduced. A sound level expressed in decibels is the logarithmic ratio of two like pressure quantities, with one pressure quantity being a reference sound pressure. For sound pressure in air the standard reference quantity is generally considered to be 20 micropascals, which directly corresponds to the threshold of human hearing. The use of the decibel is a convenient way to handle the million-fold range of sound pressures to which the human ear is sensitive. A decibel is logarithmic; it does not follow normal algebraic methods and cannot be directly added. For example, a 65 dB source of sound, such as a truck, when joined by another 65 dB source results

in a sound amplitude of 68 dB, not 130 dB (i.e., doubling the source strength increases the sound pressure by 3 dB). A sound level increase of 10 dB corresponds to 10 times the acoustical energy, and an increase of 20 dB equates to a 100 fold increase in acoustical energy.

The loudness of sound perceived by the human ear depends primarily on the overall sound pressure level and frequency content of the sound source. The human ear is not equally sensitive to loudness at all frequencies in the audible spectrum. To better relate overall sound levels and loudness to human perception, frequency-dependent weighting networks were developed. The standard weighting networks are identified as A through E. There is a strong correlation between the way humans perceive sound and A-weighted sound levels (dBA). For this reason the dBA can be used to predict community response to noise from the environment, including noise from transportation and stationary sources. Sound levels expressed as dB in this section are A-weighted sound levels, unless noted otherwise.

Noise can be generated by a number of sources, including mobile sources (transportation noise sources) such as automobiles, trucks, and airplanes and stationary sources (nontransportation noise sources) such as construction sites, machinery, and commercial and industrial operations. As acoustic energy spreads through the atmosphere from the source to the receiver, noise levels attenuate (decrease) depending on ground absorption characteristics, atmospheric conditions, and the presence of physical barriers (walls, building façades, berms). Noise generated from mobile sources generally attenuate at a rate of 4.5 dB per doubling of distance. Stationary noise sources spread with more spherical dispersion patterns that attenuate at a rate of 6 to 7.5 dB per doubling of distance.

Atmospheric conditions such as wind speed, turbulence, temperature gradients, and humidity may additionally alter the propagation of noise and affect levels at a receiver. Furthermore, the presence of a large object (e.g., barrier, topographic features, and intervening building façades) between the source and the receptor can provide significant attenuation of noise levels at the receiver. The amount of noise level reduction or "shielding" provided by a barrier primarily depends on the size of the barrier, the location of the barrier in relation to the source and receivers, and the frequency spectra of the noise. Natural barriers such as berms, hills, or dense woods, and human-made features such as buildings and walls may be used as noise barriers.

2. Noise Descriptors

The intensity of environmental noise fluctuates over time, and several different descriptors of time-averaged noise levels are used. The selection of a proper noise descriptor for a specific source depends on the spatial and temporal distribution, duration, and fluctuation of both the noise source and the environment. The noise descriptors most often used to describe environmental noise are defined below.

Equivalent Noise Level (L_{eq}): The energy mean (average) noise level.

Maximum Noise Level (L_{max}): The highest A/B/C weighted integrated noise level occurring during a specific period of time.

Minimum Noise Level (L_{min}): The lowest A/B/C weighted integrated noise level during a specific period of time.

Day-Night Noise Level (L_{dn}): The 24-hour L_{eq} with a 10-dB "penalty" applied during nighttime noise-sensitive hours, 10 p.m. through 7 a.m.

Community Noise Equivalent Level (CNEL): Similar to the L_{dn} described above, but with an additional 5-dB "penalty" for the noise-sensitive hours between 7 p.m. to 10 p.m., which are typically reserved for relaxation, conversation, reading, and watching television.

Community noise is commonly described in terms of the ambient noise level, which is defined as the all-encompassing noise level associated with a given noise environment. A common statistical tool to measure the ambient noise level is the L_{eq} descriptor listed above, which corresponds to a steady-state A-weighted sound level containing the same total energy as a time-varying signal over a given time period (usually one hour). The L_{eq} is the foundation of the composite noise descriptors such as L_{dn} and CNEL, as defined above, and shows very good correlation with community response to noise.

3. Effects of Noise on Humans

Excessive and chronic exposure to elevated noise levels can result in auditory and non-auditory effects on humans. Auditory effects of noise on people are those related to temporary or permanent hearing loss caused by loud noises. Non-auditory effects of exposure to elevated noise levels are those related to behavioral and physiological effects. The non-auditory behavioral effects of noise on humans are associated primarily with the subjective effects of annoyance, nuisance, and dissatisfaction, which lead to interference with activities such as communications, sleep, and learning. The non-auditory physiological health effects of noise on humans have been the subject of considerable research attempting to discover correlations between exposure to elevated noise levels and health problems, such as hypertension and cardiovascular disease. The mass of research infers that noise-related health issues are predominantly the result of behavioral stressors and not a direct noise-induced response. The extent to which noise contributes to non-auditory health effects remains a subject of considerable research, with no definitive conclusions.

The degree to which noise results in annoyance and interference is highly subjective and may be influenced by several non-acoustic factors. The number and effect of these non-acoustic environmental and physical factors vary depending on individual characteristics of the noise environment such as sensitivity, level of activity, location, time of day, and length of exposure. One key aspect in the prediction of human response to new noise environments is the individual level of adaptation to an existing noise environment. The greater the change in the noise levels that are attributed to a

new noise source, relative to the environment an individual has become accustom to, the less tolerable the new noise source will be perceived.

With respect to how humans perceive and react to changes in noise levels, a 1 dB increase is imperceptible, a 3 dB increase is barely perceptible, a 6 dB increase is clearly noticeable, and a 10 dB increase is subjectively perceived as approximately twice as loud (Egan 1988). These subjective reactions to changes in noise levels was developed on the basis of test subjects' reactions to changes in the levels of steady-state pure tones or broad-band noise and to changes in levels of a given noise source. It is probably most applicable to noise levels in the range of 50 to 70 dB, as this is the usual range of voice and interior noise levels. For these reasons, a noise level increase of 3 dB or more is typically considered substantial in terms of the degradation of the existing noise environment.

4. Vibration

Vibration is the periodic oscillation of a medium or object with respect to a given reference point. Sources of vibration include natural phenomena (e.g., earthquakes, volcanic eruptions, sea waves, landslides) and those introduced by human activity (e.g., explosions, machinery, traffic, trains, construction equipment). Vibration sources may be continuous, (e.g., operating factory machinery or transient in nature, explosions). Vibration levels can be depicted in terms of amplitude and frequency, relative to displacement, velocity, or acceleration.

Vibration amplitudes are commonly expressed in peak particle velocity (PPV) or root-mean-square (RMS) vibration velocity. PPV is defined as the maximum instantaneous positive or negative peak of a vibration signal. PPV is typically used in the monitoring of transient and impact vibration and has been found to correlate well to the stresses experienced by buildings (Federal Transit Administration [FTA] 2006, California Department of Transportation [Caltrans] 2004). PPV and RMS vibration velocity are normally described in inches per second (in/sec).

Although PPV is appropriate for evaluating the potential for building damage, it is not always suitable for evaluating human response. The response of the human body to vibration relates well to average vibration amplitude; therefore, vibration impacts on humans are evaluated in terms of RMS vibration velocity. Similar to airborne sound, vibration velocity can be expressed in decibel notation as vibration decibels (VdB). The logarithmic nature of the decibel serves to compress the broad range of numbers required to describe vibration.

Typical outdoor sources of perceptible groundborne vibration include construction equipment, steel-wheeled trains, and traffic on rough roads. Although the effects of vibration may be imperceptible at low levels, effects may result in detectable vibrations and slight damage to nearby structures at moderate and high levels, respectively. At the highest levels of vibration, damage to structures is primarily architectural (e.g., loosening and cracking of plaster or stucco coatings) and rarely results in damage to

structural components. The range of vibration that is relevant to this analysis occurs from approximately 50 VdB, which is the typical background vibration-velocity level, to 100 VdB, which is the general threshold where minor damage can occur in fragile buildings (FTA 2006).

5. Existing Sources and Sensitive Land Uses

The existing noise environment in the project area is primarily influenced by transportation noise from vehicle traffic on the roadway systems (e.g., highways, freeways, primary arterials, and major local streets) and non-transportation noise from commercial and industrial operations. Other noise sources that contribute to the existing noise environment include passenger and freight on-line railroad operations and ground rapid transit systems; commercial, general aviation, heliport, and military airport operations (e.g., jet engine test stands, ground facilities and maintenance) and overflights; and to a much lesser extent construction sites, schools (e.g., play fields), residential and recreational areas (e.g., landscape maintenance activities, dogs barking, people talking), agricultural activities, and others. Those noted above are also considered sources of vibration in the project area. With regards to the covered entities, existing noise conditions vary depending on location, but are typically characterized as noisy urban industrial areas including such noise sources as stationary machinery, transportation (e.g., surface vehicles, heavy-duty diesel trucks, construction equipment), and other industrial-related activities. Noise-sensitive land uses are generally considered to include those uses where noise exposure could result in health-related risks to individuals, as well as places where quiet is an essential element of their intended purpose. Residential dwellings are of primary concern because of the potential for increased and prolonged exposure of individuals to both interior and exterior noise levels. Additional land uses such as parks, historic sites, cemeteries, and recreation areas are also generally considered sensitive to increases in exterior noise levels. Places of worship and transit lodging, and other places where low interior noise levels are essential are also considered noise-sensitive.

Those noted above are also considered vibration-sensitive land uses in addition to commercial and industrial buildings where vibration would interfere with operations within the building, including levels that may be well below those associated with human annoyance. Equipment such as electron microscopes and high-resolution lithographic equipment can be very sensitive to vibration, and even normal optical microscopes will sometimes be difficult to use when vibration is well below the human annoyance level. Manufacturing of computer chips is an example of a vibration-sensitive process. This category does not include most computer installations or telephone switching equipment because most such equipment is designed to operate in typical building environments where the equipment may experience occasional shock from bumping and continuous background vibration caused by other equipment (FTA 2006).

Population and Housing

United States

The employed civilian labor force, unemployment rates, employment opportunities, and population estimates and projections for cities, counties, and states are collected every ten years by the U.S. Census Bureau (Census). As of July 1, 2015, the United States population was approximately 321 million, who live in approximately 134 million housing units. (US Census Bureau 2016).

California

a) Population

The estimated population of California in 2015 was estimated to be approximately 38,897,000 (DOF 2014). Since California became a state in 1850, the population has been increasing rapidly. Within the first 150 years of California's statehood, the population increased from fewer than 100,000 citizens to approximately 37 million in 2000 (DOF 2012). It is expected that the population of California will reach approximately 44 million in 2030 and approximately 50 million in 2050 (DOF 2012).

b) Housing

As population within the state increases, housing distribution and household conditions are expected to evolve. Estimated housing units, households, and vacancy rates for the State of California in 2013 are shown below in Table A1-5. Data was derived from the 2010 Census (US Census Bureau 2014).

Table A1-5
California Housing Profile

Housing units, 2014	13,900,766
Homeownership rate, 2009-2013	55.3 percent
Households, 2009-2013	12,542,460
Persons per Household, 2009-2013	2.94
Housing units in Multi-units structures, 2009-2013	31 percent
Source: US Census 2014	

c) Employment

In mid-2015, the civilian labor force in California was approximately 19,043,000. Of this labor force, approximately 17,484,000 people were employed and 1,195,000 were considered unemployed. The number of and the unemployment rate decreased steadily decreased in 2015 from 7.0 percent in January to 6.3 percent in June (DOF 2015).

Canada

The Canada Census Program provides a statistical portrait of the country every five years. The last census was conducted in May 2011 and consisted of the Census of

Agriculture, the Census of Population, and the 2011 National Household Survey. In 2015, the total population of Canada was approximately 36 million people (Statcan 2015).

Public Services

United States

In the United States, the Federal Bureau of Investigation (FBI) is an agency of the United States Department of Justice that serves as both a federal criminal investigative body and an internal intelligence agency. The FBI's main goal is to protect and defend the United States against terrorist and foreign intelligence threats, to uphold and enforce the criminal laws of the United States, and to provide leadership and criminal justice services to federal, state, municipal, and international agencies and partners. The U.S. EPA is an agency of the federal government of the United States charged with protecting human health and the environment, by writing and enforcing regulations based on laws passed by Congress. The U.S. EPA's Criminal Investigation Division primary mission is the enforcement of the United States' environmental laws as well as any other federal law in accordance with the guidelines established by the Attorney General of the United States (18 U.S.C. 3063). These environmental laws include those specifically related to air, water and land resources.

The United States Forest Service is an agency of the United States Department of Agriculture that administers the nation's 155 national forests and 20 national grasslands, which encompass 193 million acres (780,000 km2). Major divisions of the agency include the National Forest System, State and Private Forestry, and the Research and Development branch. The Fire and Aviation Management part of the US Forest Service works to advance technologies in fire management and suppression, maintain and improve the extremely efficient mobilization and tracking systems in place, and reach out in support of our Federal, State, and International fire partners.

California

1. Law Enforcement

Enforcement of environmental laws in California is the responsibility of the Attorney General's Office and the CalEPA. The Attorney General represents the people of California in civil and criminal matters before trial courts, appellate courts and the supreme courts of California and the United States In regards to environmental issues, the Attorney General enforces laws that safeguard the environment and natural resources in the state. Recent actions by the Attorney General related to air quality and climate change issues include: legally defending the state's clean cars law against multiple challenges, filing numerous actions against the Bush Administration regarding regulation of global warming pollution, working with local governments to ensure that land use planning processes take account of global warming, promoting renewable energy and enhanced energy efficiency in California, and working with other state leaders and agencies to implement AB 32, the Global Warming Solutions Act of 2006.

CalEPA was created in 1991 by Governor's Executive Order. CalEPA's mission is to restore, protect and enhance the environment, to ensure public health, environmental quality and economic vitality. The CalEPA is comprised of various boards, departments and offices, including: ARB, Department of Pesticide Regulation, DTSC, Office of Environmental Health Hazard Assessment, and SWRCB (including the nine RWQCBs).

California's environmental laws are enforced by state and local agencies, each charged with enforcing the laws governing a specific media such as air, water, hazardous waste, solid waste, and pesticides. Enforcement agencies for these media are as follows:

Air: ARB (part of CalEPA) and Local Air Districts.

Water: SWRCB (part of CalEPA), RWQCBs (part of CalEPA), local waste water officials, and the California Department of Public Health.

Hazardous Waste: DTSC (part of CalEPA) and CUPA.

Carcinogens/Reproductive Toxins: Prop. 65 through the Office of Environmental Health Hazard Assessment (part of CalEPA).

Pesticides: Department of Pesticide Regulation (part of CalEPA) and County Agricultural Commissioners

Statewide law enforcement service is provided by the California Highway Patrol, which is responsible for protecting State resources and providing crime prevention services and traffic enforcement along the State's highways and byways.

Community law enforcement service is provided by local police and sheriff agencies (i.e., cities and counties, respectively) to prevent crime, respond to emergency incidents, and provide traffic enforcement on local roadways.

2. Fire Protection and Emergency Medical Response Services

State-level fire protection and emergency response service is provided by the California Department of Forestry and Fire Protection (CAL FIRE), primarily in rural areas of the State. CAL FIRE is an emergency response and resource protection department. CAL FIRE protects lives, property and natural resources from fire, responds to emergencies of all types, and protects and preserves timberlands, wildlands, and urban forests.

Local and urban fire protection service is provided by local fire districts and/or local agencies (e.g., fire departments of cities and counties). In addition to providing fire response services most fire agencies also provide emergency medical response services (i.e., ambulance services) within their service areas.

3. Schools

Statewide, the regulation of education for youth is provided by the California Department of Education. The State Board of Education (SBE) is the governing and policy-making body of the California Department of Education. The SBE sets K-12 education policy in the areas of standards, instructional materials, assessment, and accountability. Locally, school districts are responsible for the management and development of elementary, middle, and high-school facilities.

Canada

The Royal Canadian Mounted Police (RCMP) is Canada's federal police agency. The RCMP's mandate, as outlined in section 18 of the Royal Canadian Mounted Police Act, is multi-faceted. It includes preventing and investigating crime; maintaining peace and order; enforcing laws; contributing to national security; ensuring the safety of state officials, visiting dignitaries and foreign missions; and providing vital operational support services to other police and law enforcement agencies within Canada and abroad (RCMP 2016).

Canada's forests and wildlands are largely under public ownership, and wildland fire management is therefore carried out mainly by government agencies acting in the public interest and paid for with public funds. Provincial governments have title to most of the forest and other wildland regions in Canada and thus have had responsibility for fire management on provincial crown lands since Confederation.

Recreation

United States and Canada

Recreational resources and facilities are provided and managed at federal, state, and local levels. Recreation resources include national parks and monuments, national forests and grasslands, wildlife refuges, wilderness areas, lakes and lands managed by different agencies in the federal government, wild and scenic rivers, and back country byways, national trials, and marine reserves and estuaries.

California

California contains 118 state parks, nine state recreation areas, 8 state forests, as well as numerous reserve, wildlife areas, and fish hatcheries. General plans for State parks, recreation areas, and beaches are publicly available. The California Outdoor Recreation Plan and associated research provide policy guidance to all public agencies – federal, state, local, and special districts that oversee outdoor recreation on lands, facilities and services throughout California. Agencies and departments that have involvement in recreational activities include Boating and Waterways, Fish and Wildlife, Tahoe Regional Planning Association, various conservancies, and others (California State Parks 2008).

Recreational lands and facilities are also managed by regional and local park and recreation agencies and open space districts. City and county general plans contain

recreation elements that provide framework for planning agencies to consider when projects are developed and implemented.

Transportation and Traffic

United States, Canada, and California

Existing roadway systems in-state and in out-of-state areas generally consist of highways, freeways, arterials, local streets, and intersections/ramps. The existing average annual daily traffic (AADT) volumes on the roadway segments that comprise these systems vary considerably (i.e., from hundreds to hundreds of thousands). The level of service (LOS), a scale used to determine the operating quality of a roadway segment or intersection based on volume-to-capacity ratio (V/C) or average delay, also vary from LOS A, the best and smoothest operating conditions, to LOS F, most congested operating conditions. Other roadway and traffic volume characteristics such as roadway length, number of lanes and facility type (e.g., two-lane freeway), right-of-way width and pavement width, terrain classification (e.g., flat), percent of heavy-duty truck traffic, and accident rates (e.g., number of accidents per million vehicle miles traveled) also vary substantially depending on the location. In addition to the roadway systems, circulation networks provide additional transportation opportunities and include mass transit, airports, and non-motorized travel (e.g., pedestrian and bicycle paths).

Utilities and Service Systems

United States and Canada

Utilities and services systems include water supplies, wastewater treatment facilities, electric and gas supplies, and solid waste collection and disposal. These services are typically provided through regional or local companies and agencies.

2. California

a) Water Supply and Distribution

The principal water supply facilities in California are operated by the USBR and DWR. In California, the Mid-Pacific Region of the USBR is responsible for the management of the Central Valley Project (CVP). The CVP serves farms, homes, and industry in California's Central Valley as well as the major urban centers in the San Francisco Bay Area. The CVP consists of 20 dams and reservoirs, 11 power plants, and 500 miles of major canals and reaches from the Cascade Mountains near Redding in the north to the Tehachapi Mountains near Bakersfield in the south. In addition to delivering water for municipal and industrial uses and the environment, the CVP produces electric power and provides flood protection, navigation, recreation, and water quality benefits (USBR 2011).

DWR is a State agency that is responsible for managing and implementing the State Water Project (SWP). The SWP is a water storage and delivery system of reservoirs, aqueducts, power plants and pumping plants. Its main purpose is to store water and

distribute it to 29 urban and agricultural water suppliers in Northern California, the San Francisco Bay Area, the San Joaquin Valley, the Central Coast, and Southern California (DWR 2010).

Local water districts, irrigation districts, special districts, and jurisdictions (e.g., cities and counties) manage and regulate the availability of water supplies and the treatment and delivery of water to individual projects. Depending on their location and the source of their supplies, these agencies may use groundwater, surface water through specific water entitlements, or surface water delivered through the CVP or SWP. In some remote areas not served by a water supply agency, individual developments may need to rely upon the underlying groundwater basin for their water supply. In these cases, the project would be required to secure a permit from the local or state land use authority and seek approval for development of the groundwater well(s).

b) Wastewater Collection and Treatment

The SWRCB is the state agency responsible for the regulation of wastewater discharges to surface waters and groundwater via land discharge. The SWRCB and nine RWQCBs are responsible for development and enforcement of water quality objectives and implementation plans that protect the beneficial uses of the federal and state waters. The SWRCB also administers water rights in California. The RWQCB's are responsible for issuing permits or other discharge requirements to individual wastewater dischargers and for ensuring that they are meeting the requirements of the permit through monitoring and other controls.

Wastewater collection, treatment, and discharge service for developed and metropolitan areas is typically provided by local wastewater service districts or agencies that may or may not be operated by the local jurisdiction (e.g., city or county). These agencies are required to secure treatment and discharge permits for the operation of a wastewater facility from the RWQCB. Wastewater is typically collected from a specific development and conveyed through a series of large pipelines to the treatment facility where it is treated to permitted levels and discharged to surface waters or the land.

In areas that are remote or that are not served by an individual wastewater service provider, developments would be required to install an individual septic tank or other on-site wastewater treatment system. These facilities would need to be approved by the local or state land use authority and the RWQCB.

c) Electricity and Natural Gas

The CPUC regulates investor-owned electric and natural gas companies located within California. The CPUC's Energy Division develops and administers energy policy and programs and monitors compliance with the adopted regulations. One-third of California's electricity and natural gas is provided by one of three companies: Pacific Gas and Electric Company, Southern California Edison, San Diego Gas and Electric Company (CPUC 2010).

Locally, energy service is provided by a public or private utility. New development projects would need to coordinate with the local service provider to ensure adequate capacity is available to serve the development.

d) Solid Waste Collection and Disposal

Statewide, the California Department of Resources Recycling and Recovery (CalRecycle), which is a department of the CNRA, is responsible for the regulation of the disposal and recycling of all solid waste generated in California. Cal Recycle acts as an enforcement agency in the approval and regulation of solid waste disposal and recycling facilities. Local agencies can create local enforcement agencies and, once approved by Cal Recycle, they can serve as the enforcement agency for landfills and recycling facilities with their jurisdictions.

Local agencies or private companies own and operate landfill facilities and solid waste is typically hauled to these facilities by private or public haulers. Individual projects would need to coordinate with the local service provider and landfill to determine if adequate capacity exists to serve the project.

2 REGULATORY SETTING

A. UNITED STATES, STATE OF CALIFORNIA, AND LOCAL REGULATORY SETTING

1. Aesthetics

Applicable laws and regulations associated with aesthetics and scenic resources are discussed in Table A2-1.

Table A2-1
Applicable Laws and Regulations for Aesthetic Resources

Applicable Regulations	Description
Federal	
Federal Land Policy and Management Act of 1976 (FLPMA)	FLPMA is the enabling legislation establishing the Bureau of Land Management's (BLM's) responsibilities for lands under its jurisdiction. Section 102 (a) of the FLPMA states that "…the public lands be managed in a manner that will protect the quality of scientific, scenic, historical, ecological, environmental, air and atmospheric, water resources, and archeological values…" Section 103(c) identifies "scenic values" as one of the resources for which public land should be managed.

Table A2-1
Applicable Laws and Regulations for Aesthetic Resources

Applicable Regulations	Description
BLM Contrast Rating System	The contrast rating system is a systematic process used by BLM to analyze visual impacts of proposed projects and activities. It is primarily intended to assist BLM personnel in the resolution of visual impact assessment.
Natural Historic Preservation Act (NHPA)	Under regulations of the NHPA, visual impacts to a listed or eligible National Register property that may diminish the integrity of the property's "setting … [or] … feeling" in a way that affects the property's eligibility for listing may result in a potentially significant adverse effect. "Examples of adverse effects … include…: Introduction of visual, atmospheric, or audible elements that diminish the integrity of the property's significant historic features." (Title 36 Code of Federal Regulations CFR (CFR) Part 800.5)
National Scenic Byways Program	Title 23, Sec 162 outlines the National Scenic Byways Program. This program is used to recognize roads having outstanding scenic, historic, cultural, natural, recreational, and archaeological qualities through designation of road as: National Scenic Byways; All-American Roads; or America's Byways. Designation of the byways provides eligibility for Federal assistance for safety improvement, corridor management plans, recreation access, or other project that protect scenic, historical, recreational, cultural, natural, and archaeological resources.
State	
Ambient Air Quality Standard for Visibility-Reducing Particles	Extinction coefficient (measure of absorption of light in a medium) of 0.23 per kilometer — visibility of 10 miles or more (0.07 — 30 miles or more for Lake Tahoe) due to particles when relative humidity is less than 70 percent.
California Streets and Highway Code, Section 260 through 263 – Scenic Highways	The State Scenic Highway Program promotes protection of designated State scenic highways through certification and adoption of local scenic corridor protection programs that conform to requirements of the California Scenic Highway Program.

Table A2-1 Applicable Laws and Regulations for Aesthetic Resources	
Applicable Regulations	**Description**
Local	
County and City Controls	Most local planning guidelines to preserve and enhance the visual quality and aesthetic resources of urban and natural areas are established in the jurisdiction's general plan. The value attributed to a visual resource generally is based on the characteristics and distinctiveness of the resource and the number of persons who view it. Vistas of undisturbed natural areas, unique or unusual features forming an important or dominant portion of a viewshed, and distant vistas offering relief from less attractive nearby features are frequently considered to be scenic resources. In some instances, a case-by-case determination of scenic value may be needed, but often there is agreement within the relevant community about which features are valued as scenic resources. In addition to federal and State designations, counties and cities have their own scenic highway designations, which are intended to preserve and enhance existing scenic resources. Criteria for designation are commonly included in the conservation/open space element of the city or county general plan.

2. Agricultural and Forest Resources

Table A2-2 below provides a general description of applicable laws and regulations that may pertain to agriculture and forest resources.

Table A2-2 Applicable Laws and Regulations for Agriculture and Forest Resources	
Applicable Regulations	**Description**
Federal	
Farmland Protection Policy Act (FPPA)	FPPA directs federal agencies to consider the effects of federal programs or activities on farmland, and ensure that such programs, to the extent practicable, are compatible with state, local, and private farmland protection programs and policies. The rating process established under the FPPA was developed to help assess options for land use on an evaluation of productivity weighed against commitment to urban development.
National Forest Management Act	NFMA is the primary statute governing the administration of national forests. The act requires the Secretary of Agriculture to

Table A2-2
Applicable Laws and Regulations for Agriculture and Forest Resources

Applicable Regulations	Description
(NFMA) of 1976	assess forest lands, develop a management program based on multiple-use, sustained-yield principles, and implement a resource management plan for each unit of the National Forest System. Goal 4 of the U.S. Forest Service's National Strategic Plan for the National Forests states that the nation's forests and grasslands play a significant role in meeting America's need for producing and transmitting energy. Unless otherwise restricted, National Forest Service lands are available for energy exploration, development, and infrastructure (e.g., well sites, pipelines, and transmission lines). However, the emphasis on non-recreational special uses, such as utility corridors, is to authorize the special uses only when they cannot be reasonably accommodated on non-National Forest Service lands.
State	
The California Land Conservation Act, also known as the Williamson Act (Government Code Section 51200)	The California Department of Conservation's (DOC's) Division of Land Resource Protection administers the Williamson Act program, which permits property tax adjustments for landowners who contract with a city or county to keep their land in agricultural production or approved open space uses for at least 10 years. Lands covered by Williamson Act contracts are assessed on the basis of their agricultural value instead of their potential market value under nonagricultural uses. In return for the preferential tax rate, the landowner is required to contractually agree to not develop the land for a period of at least 10 years. Williamson Act contracts are renewed annually for 10 years unless a party to the contract files for nonrenewal. The filing of a non-renewal application by a landowner ends the automatic annual extension of a contract and starts a 9-year phase-out of the contract. During the phase-out period, the land remains restricted to agricultural and open-space uses, but property taxes gradually return to levels associated with the market value of the land. At the end of the 9-year non-renewal process, the contract expires and the owner's uses of the land are restricted only by applicable local zoning. The Williamson Act defines compatible use of contracted lands as any use determined by the county or city administering the agricultural preserve to be compatible with the agricultural, recreational, or open space use of land within the preserve and subject to contract (Government Code, Section 51202[e]). However, uses deemed compatible by a county or city government must be consistent with the principles of compatibility set forth in

Table A2-2
Applicable Laws and Regulations for Agriculture and Forest Resources

Applicable Regulations	Description
	Government Code, Section 51238.1. Approximately 16 million acres of farmland (about 50 percent of the State's total farmland) are enrolled in the program.
California Farmland Conservancy Program (CFCP) (Public Resources Code [PRC] Section 10200)	The program provides grant funding for agricultural conservation easements. Although the easements are always written to reflect the benefits of multiple resource values, there is a provision in the CFCP statute that prevents easements funded under the program from restricting husbandry practices. This provision could prevent restricting those practices to benefit other natural resources.
Farmland Mapping and Monitoring Program (FMMP) (Government Code Section 65570, PRC Section 612)	Under the FMMP, the DOC assesses the location, quality, and quantity of agricultural lands and conversion of these lands over time. Agricultural designations include the categories of Prime Farmland, Farmland of Statewide Importance, Unique Farmland, Farmland of Local Importance, Grazing Land, Urban and Built-Up Land, and Other Land. FMMP uses the following definitions to describe farmland types. Prime Farmland is defined by the DOC as "Land with the best combination of physical and chemical features able to sustain long term production of agricultural crops. This land has the soil quality, growing season, and moisture supply needed to produce sustained high yields. Land must have been used for production of irrigated crops at some time during the past four years." Farmland of Statewide Importance is defined by the DOC as "Land similar to Prime Farmland that has a good combination of physical and chemical characteristics for the production of agricultural crops. This land has minor shortcomings, such as greater slopes or less ability to store soil moisture than Prime Farmland. Land must have been used for production of irrigated crops at some time during the past four years." Unique Farmland is defined by the DOC as "Lesser quality soils used for the production of the State's leading agricultural crops. This land is usually irrigated, but may include non-irrigated orchards or vineyard as found in some climatic zones in California."
State Lands Commission Significant Land Inventory	The State Lands Commission is responsible for managing lands owned by the State, including lands that the State has received from the federal government. These lands total more than 4 million acres and include tide and submerged lands, swamp and overflow lands, the beds of navigable waterways,

Table A2-2 Applicable Laws and Regulations for Agriculture and Forest Resources	
Applicable Regulations	**Description**
	and State School Lands. The State Lands Commission has a legal responsibility for, and a strong interest in, protecting the ecological and Public Trust values associated with the State's sovereign lands, including the use of these lands for habitat preservation, open space and recreation. Scoping Plan projects located within these lands would be subject to the State Lands Commission permitting process.
Local	
Open Space Element	State law requires each city and county to adopt a general plan containing at least seven mandatory elements including an open space element. The open space element identifies open space resources in the community and strategies for protection and preservation of these resources. Agricultural and forested lands are among the land use types identified as open space in general plans.
Zoning	The city or county zoning code is the set of detailed requirements that implement the general plan policies at the level of the individual parcel. The zoning code presents standards for different land uses and identifies which land uses (e.g., agriculture, residential, commercial, industrial) are allowed in the various zoning districts of the jurisdiction. Since 1971, state law has required the city or county zoning code to be consistent with the jurisdiction's general plan, except in charter cities.

3. Air Quality

Applicable laws and regulations associated with air quality are discussed in Table A2-3.

Table A2-3 Applicable Laws and Regulations for Air Quality	
Regulation	**Description**
Federal	
Clean Air Act (CAA) (40 CFR)	CAA, which was last amended in 1990, requires the U.S. EPA to set National Ambient Air Quality Standards (NAAQS) for pollutants considered harmful to public health and the environment. CAA established two types of NAAQS: primary standards set limits to protect public health, including the health of "sensitive" populations such as asthmatics, children, and the elderly; and secondary standards set limits to protect public

Table A2-3 Applicable Laws and Regulations for Air Quality	
Regulation	**Description**
	welfare, including protection against decreased visibility, damage to animals, crops, vegetation, and buildings. U.S. EPA Office of Air Quality Planning and Standards has set NAAQS for six principal pollutants, which are called "criteria" pollutants. Title III of the CAA directed the U.S. EPA to promulgate national emissions standards for Hazardous Air Pollutants. The CAA also required the U.S. EPA to promulgate vehicle or fuel standards containing reasonable requirements that control toxic emissions, at a minimum to benzene and formaldehyde. Performance criteria were established to limit mobile-source emissions of toxics, including benzene, formaldehyde, and 1,3-butadiene. In addition, Section 219 required the use of reformulated gasoline in selected areas with the most severe ozone nonattainment conditions to further reduce mobile-source emissions.
SmartWay	SmartWay is an U.S. EPA program that reduces transportation-related emissions by creating incentives to improve supply chain fuel efficiency. It aims to increase the availability and market penetration of fuel efficient technologies and strategies that help freight companies save money while also reducing adverse environmental impacts.
Other Applicable Federal-Level Regulations	This includes all other applicable regulations at the federal level for portions of the project area that are outside of the U.S. (e.g., Canada).
State	
California Clean Air Act (CCAA) CCR (Titles 13 and 17)	ARB is the agency responsible for coordination and oversight of State and local air pollution control programs in California and for implementing the CCAA. The CCAA, which was adopted in 1988, required the ARB to establish California ambient air quality standards (CAAQS).
Waste Heat and Carbon Emissions Reduction Act	This Act is designed to encourage the development of new combined heat and power (CHP) systems in California with a generating capacity of not more than 20 megawatts. Section 2843 of the Act provides that the Energy Commission's guidelines require that CHP systems: be designed to reduce waste energy; have a minimum efficiency of 60 percent; have NO_X emissions of no more than 0.07 pounds per megawatt-hour; be sized to meet the eligible customer generation thermal load; operate continuously in a manner that meets the expected thermal load and optimizes the efficient use of waste heat; be cost effective, technologically feasible, and environmentally beneficial.

Table A2-3 Applicable Laws and Regulations for Air Quality	
Regulation	**Description**
Other Applicable State-Level Regulations	This includes all other applicable regulations at the State level for portions of the project area that are outside of California (e.g., AB 1807 and AB 2588).
Local	
Air Districts	Air Districts have primary responsibility for preparation, adoption, and implementation of mobile, stationary, and area emission control measures and for the preparation of the SIP and any amendments.

4. Biological Resources

Applicable laws and regulations associated with biological resources are discussed in Table A2-4.

Table A2-4 Applicable Laws and Regulations for Biological Resources	
Applicable Law	**Description**
Federal	
Federal Endangered Species Act (ESA)	Designates and provides for protection of threatened and endangered plant and animal species, and their critical habitat. Two sections of the ESA address take of threatened and endangered species. Section 7 covers actions that would result in take of a federally-listed species and have a federal discretionary action. Section 10 regulates actions that would result in take of threatened or endangered species and a non-federal agency is the lead agency for the action. Section 10 of the ESA requires preparation of a habitat conservation plan (HCP). More than 430 HCPs have been approved nation-wide.
Migratory Bird Treaty Act	Makes it unlawful to take or possess any migratory nongame bird (or any part of such migratory nongame bird) as designated in the Migratory Bird Treaty Act.

Table A2-4 Applicable Laws and Regulations for Biological Resources	
Applicable Law	**Description**
Clean Water Act (CWA)	Requires the permitting and monitoring of all discharges to surface water bodies. Section 404 requires a permit from the U.S. Army Corps of Engineers (USACE) for a discharge from dredged or fill materials into Waters of the United States, including wetlands. Section 401 requires a permit from a regional water quality control board (RWQCB) for the discharge of pollutants. By federal law, every applicant for a federal permit or license for an activity that may result in a discharge into a California water body, including wetlands, must request State certification that the proposed activity would not violate State and federal water quality standards.
Rivers and Harbors Act of 1899	Requires permit or letter of permission from USACE prior to any work being completed within navigable waters.
U.S. EPA Section 404 (b)(1) Guidelines	Requires USACE to analyze alternatives in a sequential approach such that USACE must first consider avoidance and minimization of impacts to the extent practicable to determine whether a proposed discharge can be authorized.
California Desert Conservation Area Plan (CDCA)	Comprises one of two national conservation areas established by Congress in 1976. FLPMA outlines how BLM would manage public lands. Congress specifically provided guidance for the management of the CDCA and directed the development of the 1980 CDCA Plan.
Federal Noxious Weed Act of 1974 (P.L. 93-629) (7 U.S.C. 2801 et seq.; 88 Stat. 2148)	Establishes a federal program to control the spread of noxious weeds. Authority is given to the Secretary of Agriculture to designate plants as noxious weeds by regulation, and the movement of all such weeds in interstate or foreign commerce was prohibited except under permit.
Executive Order 13112, "Invasive Species," February 3, 1999	Federal agencies are mandated to take actions to prevent the introduction of invasive species, provide for their control, and minimize the economic, ecological, and human health impacts that invasive species cause.
Executive Order 11988, "Floodplain Management," May 24, 1977	Requires federal agencies to avoid to the extent possible the long- and short-term adverse impacts associated with the occupancy and modification of flood plains and to avoid direct and indirect support of floodplain development wherever there is a practicable alternative.
Executive Order 11990, "Protection of Wetlands," May 24, 1977	Requires all federal agencies to consider wetland protection as an important part of their policies and take action to minimize the destruction, loss, or degradation of wetlands, and to preserve and enhance the natural and beneficial

Table A2-4
Applicable Laws and Regulations for Biological Resources

Applicable Law	Description
	values of wetlands.
Executive Order 13186, "Responsibilities of Federal Agencies to Protect Migratory Birds," January 10, 2001	Requires that each federal agency taking actions that have, or are likely to have, a measurable negative effect on migratory bird populations develop and implement a Memorandum of Understanding (MOU) with the U.S. Fish and Wildlife Service (USFWS) that shall promote the conservation of migratory bird populations.
Bald and Golden Eagle Protection Act	Declares it is illegal to take, possess, sell, purchase, barter, offer to sell or purchase or barter, transport, export or import a bald or golden eagle, alive or dead, or any part, nest or egg of these eagles unless authorized. Active nest sites are also protected from disturbance during the breeding season.
BLM Manual 6840 — Special Status Species Management	Establishes special status species policy on BLM land for plant and animal species and the habitats on which they depend. The policy refers to species designated by the BLM State Director as sensitive.
Listed Species Recovery Plans and Ecosystem Management Strategies	Provides guidance for the conservation and management of sufficient habitat to maintain viable populations of listed species and ecosystems. Relevant examples include, but are not limited to, the Desert Tortoise Recovery Plan, Flat-tailed Horned Lizard Rangewide Management Strategy; Amargosa Vole Recovery Plan; and Recovery Plan for Upland Species of the San Joaquin Valley.
State	
California Endangered Species Act of 1984 (Fish and Game Code, sections 2050 through 2098)	Protects California's rare, threatened, and endangered species.
Natural Community Conservation Planning (NCCP) Act 1991	The primary objective of the NCCP program is to conserve natural communities at the ecosystem level while accommodating compatible land use. An NCCP identifies and provides for the regional or areawide protection of plants, animals, and their habitats, while allowing compatible and appropriate economic activity. There are currently 23 NCCPs that have been adopted or are in progress in California.
Porter-Cologne Water Quality Control Act	Requires that each of the nine RWQCBs prepare and periodically update basin plans for water quality control. Each basin plan sets forth water quality standards for

Table A2-4
Applicable Laws and Regulations for Biological Resources

Applicable Law	Description
	surface water and groundwater and actions to control nonpoint and point sources of pollution to achieve and maintain these standards.
Wetlands Preservation (Keene-Nejedly California Wetlands Preservation Act) (PRC, Section 5810 et seq.)	California has established a successful program of regional, cooperative efforts to protect, acquire, restore, preserve, and manage wetlands. These programs include, but are not limited to, the Central Valley Habitat Joint Venture, the San Francisco Bay Joint Venture, the Southern California Wetlands Recovery Project, and the Inter-Mountain West Joint Venture.
California Wilderness Preservation System (PRC, Section 5093.30 et seq.)	Establishes a California wilderness preservation system that consists of State-owned areas to be administered for the use and enjoyment of the people in such manner as will leave them unimpaired for future use and enjoyment as wilderness, provide for the protection of such areas, preserve their wilderness character, and provide for the gathering and dissemination of information regarding their use and enjoyment as wilderness.
Significant Natural Areas (Fish and Game Code section 1930 et seq.)	Designates certain areas such as refuges, natural sloughs, riparian areas, and vernal pools as significant wildlife habitat.
Protection of Birds and Nests (Fish and Game Code section 3503 and 3503.5)	Protects California's birds by making it unlawful to take, possess, or needlessly destroy the nest or eggs of any bird. Raptors (e.g., hawks and owls) are specifically protected.
Migratory Birds (Fish and Game Code section 3513)	Protects California's migratory birds by making it unlawful to take or possess any migratory nongame bird as designated in the Migratory Bird Treaty Act or any part of such migratory nongame birds.
Fur-bearing Mammals (Fish and Game Code sections 4000 and 4002)	Lists fur-bearing mammals which require a permit for take.
Fully Protected Species (Fish and Game Code Sections 3511,4700, 5050, and 5515)	Identifies several amphibian, reptile, fish, bird, and mammal species that are Fully Protected. The California Department of Fish and Wildlife (CDFW) cannot issue a take permit for these species, except for take related to scientific research.
California Environmental Quality Act (CEQA Guidelines 15380)	CEQA defines rare species more broadly than the definitions for species listed under the state and federal Endangered Species Acts. Under section 15830, species not protected through state or federal listing but nonetheless demonstrable

Table A2-4
Applicable Laws and Regulations for Biological Resources

Applicable Law	Description
	as "endangered" or "rare" under CEQA should also receive consideration in environmental analyses. Included in this category are many plants considered rare by the California Native Plant Society (CNPS) and some animals on the CDFW's Special Animals List.
Oak Woodlands (California PRC Section 21083.4)	Requires counties to determine if a project within their jurisdiction may result in conversion of oak woodlands that would have a significant adverse effect on the environment. If the lead agency determines that a project would result in a significant adverse effect on oak woodlands, mitigation measures to reduce the significant adverse effect of converting oak woodlands to other land uses are required.
Lake and Streambed Alteration Agreement (Fish and Game Code sections 1600 et seq.)	Regulates activities that may divert, obstruct, or change the natural flow or the bed, channel, or bank of any river, stream, or lake in California designated by CDFW in which there is at any time an existing fish or wildlife resource or from which these resources derive benefit. Impacts to vegetation and wildlife resulting from disturbances to waterways are also reviewed and regulated during the permitting process.
California Desert Native Plants Act of 1981 (Food and Agricultural Code section 80001 et seq. and California Fish and Game Code sections 1925-1926)	Protects non-listed California desert native plants from unlawful harvesting on both public and private lands in Imperial, Inyo, Kern, Los Angeles, Mono, Riverside, San Bernardino, and San Diego counties. Unless issued a valid permit, wood receipt, tag, and seal by the commissioner or sheriff, harvesting, transporting, selling, or possessing specific desert plants is prohibited.
Food and Agriculture Code, Section 403	The California Department of Food and Agriculture is designated to prevent the introduction and spread of injurious insect or animal pests, plant diseases, and noxious weeds.
Noxious Weeds (Title 3, California Code of Regulations, Section 4500)	List of plant species that are considered noxious weeds.
Local	
Various City and County General Plans	General plans typically designate areas for land uses, guiding where new growth and development should occur while providing a plan for the comprehensive and long-range management, preservation, and conservation of and natural resources and open-space lands.

Table A2-4 Applicable Laws and Regulations for Biological Resources	
Applicable Law	**Description**
Various Local Ordinances	Local ordinances provide regulations for proposed projects for activities such as grading plans, erosion control, tree removal, protection of sensitive biological resources and open space.

5. Cultural Resources

Applicable laws and regulations associated with cultural resources are discussed in Table A2-5.

Table A2-5 Applicable Laws and Regulations for Cultural Resources	
Applicable Regulation	**Description**
Federal	
NHPA of 1966	The NHPA requires federal agencies to consider the preservation of historic and prehistoric resources. The Act authorizes the Secretary of the Interior to expand and maintain a National Register of Historic Places (NRHP), and it establishes an Advisory Council on Historic Preservation (ACHP) as an independent federal entity. Section 106 of the Act requires federal agencies to take into account the effects of their undertakings on historic properties and afford the ACHP a reasonable opportunity to comment on the undertaking prior to licensing or approving the expenditure of funds on any undertaking that may affect properties listed, or eligible for listing, in the NRHP.
National Environmental Policy Act (NEPA) of 1969	NEPA requires federal agencies to foster environmental quality and preservation. Section 101(b)(4) declares that one objective of the national environmental policy is to "preserve important historic, cultural, and natural aspects of our national heritage." For major federal actions significantly affecting environmental quality, federal agencies must prepare, and make available for public comment, an environmental impact statement.
Archaeological Resources Protection Act of 1979 (NRPA)(16 USC 470aa-470II)	NRPA requires a permit for any excavation or removal of archaeological resources from public lands or Indian lands. The statute provides both civil and criminal penalties for violation of permit requirements and for excavation or removal of protected resources without a permit.
Native American Graves Protection and Repatriation Act	NAGPRA vests ownership or control of certain human remains and cultural items excavated or discovered on federal or tribal lands, in designated Native American tribes, organizations, or

Table A2-5
Applicable Laws and Regulations for Cultural Resources

Applicable Regulation	Description
of 1990 (NAGPRA) (PL 101–601)	groups. The Act further requires notification of the appropriate Secretary or other head of any federal agency upon the discovery of Native American cultural items on federal or tribal lands; proscribes trafficking in Native American human remains and cultural items; requires federal agencies and museums to compile an inventory of Native American human remains and associated funerary objects, and to notify affected Indian tribes of this inventory; and provides for the repatriation of Native American human remains and specified objects possessed or controlled by federal agencies or museums.
Advisory Council Regulation, Protection of Historic Properties (SHPO) (36 CFR 800)	Establishes procedures for compliance with Section 106 of the NHPA. These regulations define the Criteria of Adverse Effect, define the role of State Historic Preservation Officer (SHPO) in the Section 106 review process, set forth documentation requirements, and describe procedures to be followed if significant historic properties are discovered during implementation of an undertaking. Prehistoric and historic resources deemed significant (i.e., eligible for listing in the NRHP, per 36 CFR 60.4) must be considered in project planning and construction. The responsible federal agency must submit any proposed undertaking that may affect NRHP-eligible properties to the SHPO for review and comment prior to project approval.
National Park Service Regulations, National Register of Historic Places (NRHP) (36 CFR 60)	Sets forth procedures for nominating properties to the NRHP, and present the criteria to be applied in evaluating the eligibility of historic and prehistoric resources for listing in the NRHP.
Archaeology and Historic Preservation; Secretary of the Interior's Standards and Guidelines (FR 190:44716–44742)	Non-regulatory technical advice about the identification, evaluation, documentation, study, and other treatment of cultural resources. Notable in these Guidelines are the "Standards for Archaeological Documentation" (p. 44734) and "Professional Qualifications Standards for Archaeology" (pp. 44740–44741).
American Indian Religious Freedom Act of 1978	The American Indian Religious Freedom Act pledges to protect and preserve the traditional religious rights of American Indians, Aleuts, Eskimos, and Native Hawaiians. Before the act was passed, certain federal laws interfered with the traditional religious practices of many American Indians. The Act establishes a national policy that traditional Native American practices and beliefs, sites (and right of access to those sites),

Table A2-5
Applicable Laws and Regulations for Cultural Resources

Applicable Regulation	Description
	and the use of sacred objects shall be protected and preserved.
Department of Transportation Act of 1966, Section 4(f)	Section 4(f) of the Act requires a comprehensive evaluation of all environmental impacts resulting from federal-aid transportation projects administered by the FHA, FTA, and FAA that involve the use—or interference with use—of several types of land: public park lands, recreation areas, and publicly or privately owned historic properties of federal, state, or local significance. The Section 4(f) evaluation must be sufficiently detailed to permit the U.S. Secretary of Transportation to determine that there is no feasible and prudent alternative to the use of such land, in which case the project must include all possible planning to minimize harm to any park, recreation, wildlife and waterfowl refuge, or historic site that would result from the use of such lands. If there is a feasible and prudent alternative, a proposed project using Section 4(f) lands cannot be approved by the Secretary. Detailed inventories of the locations and likely impacts on resources that fall into the Section 4(f) category are required in project-level environmental assessments.
State	
California Health and Safety Code Section and California PRC, Section	Disturbance of human remains without the authority of law is a felony (California Health and Safety Code, Section 7052). According to State law (California Health and Safety Code, Section 7050.5, California PRC, Section 5097.98), if human remains are discovered or recognized in any location other than a dedicated cemetery, there shall be no further excavation or disturbance of the site or any nearby area reasonably suspected to overlie adjacent human remains until 1) the coroner of the county has been informed and has determined that no investigation of the cause of death is required; 2) and if the remains are of Native American origin, and if the descendants from the deceased Native Americans have made a recommendation to the landowner or the person responsible for the excavation work for means of treating or disposing of with appropriate dignity the human remains and any associated grave goods as provided in PRC Section 5097.98; or the Native American Heritage Commission was unable to identify a descendent or the descendent failed to make a recommendation within 24 hours after being notified by the Commission. According to the California Health and Safety Code, six or more human burials at one location constitute a

Table A2-5
Applicable Laws and Regulations for Cultural Resources

Applicable Regulation	Description
	cemetery (Section 8100), and disturbance of Native American cemeteries is a felony (Section 7052). Section 7050.5 requires that construction or excavation be stopped in the vicinity of discovered human remains until the coroner can determine whether the remains are those of a Native American. If the remains are determined to be Native American, the coroner must contact the Native American Heritage Commission, who has jurisdiction over Native American remains (California Health and Safety Code, 7052.5c; PRC, Section 5097.98).
California Environmental Quality Act (Guidelines Section 15380)	CEQA requires that public agencies financing or approving public or private projects must assess the effects of the project on cultural resources. Furthermore, it requires that, if a project results in significant impacts on important cultural resources, alternative plans or mitigation measures must be considered; only significant cultural resources, however, need to be addressed. Thus, prior to the development of mitigation measures, the importance of cultural resources must be determined.
AB 52 (Statutes of 2014)	AB 52 recognizes that tribal sovereignty and the unique relationship of California local governments and public agencies with California Native American tribal governments, while respecting the interests and roles of project proponents. This requires specific consultation processes for project review and approval.
Local	
City/County General Plans	Policies, goals, and implementation measures in county or city general plans may contain measures applicable to cultural and paleontological resources. In addition to the enactment of local and regional preservation ordinances, CEQA requires that resources included in local registers be considered (pursuant to section 5020.1(k) of the PRC). Therefore, local county and municipal policies, procedures, and zoning ordinances must be considered in the context of project-specific undertakings. Cultural resources are generally discussed in either the open space element or the conservation element of the general plan. Many local municipalities include cultural resources preservation elements in their general plans that include some mechanism pertaining to cultural resources in those communities. In general, the sections pertaining to archaeological and historical properties are put in place to afford the cultural resources a measure of local protection. The policies outlined in the

Table A2-5 Applicable Laws and Regulations for Cultural Resources	
Applicable Regulation	**Description**
	individual general plans should be consulted prior to any undertaking or project.
Cooperative Agreements Among Agencies	Cooperative agreements among land managing agencies (BLM, National Park Service, U.S. Forest Services, California State Parks, Bureau of Indian Affairs, Department of Defense, to name a few) the SHPO and ACHP may exist and will need to be complied with on specific projects. In addition, certain agencies have existing Programmatic Agreements requiring permits (California Public Utilities Commission [CPUC], BLM) to complete archaeological investigations and employ the Secretary of Interior's Professional Qualification Standards and Guidelines (36 CFR 61).

6. Energy Demand

Applicable laws and regulations associated with energy resources are discussed in Table A2-6.

Table A2-6 Applicable Laws and Regulations for Energy Resources	
Regulation	**Description**
Federal	
Energy Policy and Conservation Act	The Energy Policy and Conservation Act of 1975 sought to ensure that all vehicles sold in the United States would meet certain fuel economy goals. Through this Act, Congress established the first fuel economy standards for on-road motor vehicles in the United States Pursuant to the Act, the National Highway Traffic and Safety Administration, which is part of the U.S. Department of Transportation (USDOT), is responsible for establishing additional vehicle standards and for revising existing standards. From 1986 to 2012, fuel economy standards for passenger vehicles remained nearly stagnant at between 20.7 mpg for trucks and 27.5 mpg for light duty cars. In 2010, U.S. EPA adopted new passenger vehicle standards starting with the 2012 model year that incorporates GHG emissions standards on a vehicle-footprint basis and to accommodate the efficiencies of electric and other alternatively fueled vehicles. Additional standards for models years through 2025 were adopted in 2012. Translating the GHG standards to miles per

Table A2-6
Applicable Laws and Regulations for Energy Resources

Regulation	Description
	gallon equivalents, the projected fuel economy standard for new passenger cars and light trucks combined would increase from 30.1 to 54.5 between 2012 and 2025 model years. Until 2010, heavy-duty vehicles (i.e., vehicles and trucks over 8,500 pounds gross vehicle weight) were not subject to fuel economy standards. In 2011, NHTSA and U.S. EPA released fuel economy standards for medium and heavy-duty vehicles (over 8,500 pounds gross vehicle weight) for 2014 through 2018 model years. Fuel economy standards for these vehicles vary by vehicle profession and include explicit mpg goals as well as percent reduction targets. Stricter fuel economy standards for medium and heavy-duty vehicles are expected in 2015. Compliance with federal fuel economy standards is determined on the basis of each manufacturer's average fuel economy for the portion of its vehicles produced for sale in the United States The Corporate Average Fuel Economy (CAFE) program, administered by the U.S. EPA, was created to determine vehicle manufacturers' compliance with the fuel economy standards. The U.S. EPA calculates a CAFE value for each manufacturer based on city and highway fuel economy test results and vehicle sales. Based on the information generated under the CAFE program, the USDOT is authorized to assess penalties for noncompliance.
Energy Policy Act (EPAct) of 1992	EPAct was passed to reduce the country's dependence on foreign petroleum and improve air quality. EPAct includes several parts intended to build an inventory of alternative fuel vehicles (AFVs) in large, centrally fueled fleets in metropolitan areas. EPAct requires certain federal, state, and local government and private fleets to purchase a percentage of light duty AFVs capable of running on alternative fuels each year. In addition, financial incentives are included in EPAct. Federal tax deductions will be allowed for businesses and individuals to cover the incremental cost of AFVs. States are also required by the act to consider a variety of incentive programs to help promote AFVs.
Energy Policy Act of 2005	The Energy Policy Act of 2005 was signed into law on August 8, 2005. Generally, the act provides for renewed and expanded tax credits for electricity generated by qualified energy sources, such as landfill gas; provides bond financing, tax incentives, grants, and loan guarantees for a clean

Table A2-6 Applicable Laws and Regulations for Energy Resources	
Regulation	**Description**
	renewable energy and rural community electrification; and establishes a federal purchase requirement for renewable energy.
State	
Warren-Alquist State Energy Resources Conservation and Development Act of 1974	The Warren-Alquist Act is the legislation that created and gives statutory authority to the CEC (formally called the State Energy Resources Conservation and Development Commission).
Integrated Energy Policy Reports (SB 1389)	Senate Bill 1389 (Bowen, Chapter 568, Statutes of 2002) requires the CEC to prepare a biennial integrated energy policy report that contains an assessment of major energy trends and issues facing the State's electricity, natural gas, and transportation fuel sectors and provides policy recommendations to conserve resources; protect the environment; ensure reliable, secure, and diverse energy supplies; enhance the State's economy; and protect public health and safety (PRC Section 25301[a]). The CEC prepares these assessments and associated policy recommendations every 2 years, with updates in alternate years, as part of the Integrated Energy Policy Report (IEPR). Preparation of the IEPR involves close collaboration with federal, state, and local agencies and a wide variety of stakeholders in an extensive public process to identify critical energy issues and develop strategies to address those issues.
California Long-Term Energy Efficiency Strategic Plan	On September 18, 2008, the CPUC adopted California's first Long Term Energy Efficiency Strategic Plan, presenting a single roadmap to achieve maximum energy savings across all major groups and sectors in California. This comprehensive plan for 2009 to 2020 is the State's first integrated framework of goals and strategies for saving energy, covering government, utility, and private sector actions, and holds energy efficiency to its role as the highest priority resource in meeting California's energy needs. The plan was updated in January 2011 to include a lighting chapter.
California Building Energy Efficiency Standards (24 CCR Part 6)	California's Building Energy Efficiency Standards conserve electricity and natural gas in new building construction and are administered by the CEC. Local governments enforce the standards through local building permitting and inspections. The CEC has updated these standards on a periodic basis. The new

Table A2-6
Applicable Laws and Regulations for Energy Resources

Regulation	Description
	2013 Building Energy Efficiency Standards, which take effect on January 1, 2014, are approximately 25 percent more efficient than previous standards for residential construction and 30 percent more efficient for nonresidential construction.
Comprehensive Energy Efficiency Plan for Existing Buildings (AB 758)	Assembly Bill 758 (Skinner, Chapter 470, Statutes 2009) requires the CEC, in collaboration with the CPUC and stakeholders, to develop a comprehensive program to achieve greater energy efficiency in the State's existing buildings.
California Renewable Energy Portfolio Standard (RPS) (SB X1-2)	In 2011, Governor Brown signed SB X1-2, which requires retail sellers of electricity, including investor-owned utilities and community choice aggregators, to provide at least 33 percent of their electricity supply (portfolio) from renewable sources by 2020. The CPUC and the CEC jointly implement the Statewide RPS program through rulemakings and monitoring the activities of electric energy utilities in the state.
California Qualifying Facility and Combined Heat and Power Program Settlement	In December 2010, the CPUC approved California's Qualifying Facility and Combined Heat and Power Program Settlement, which established a CHP framework for the State's investor-owned utilities. The settlement established a near-term target of 3,000 megawatts (MW) of CHP for entities under the jurisdiction of the CPUC, although this target includes not just new CHP, but capacity from renewal of contracts due to expire in the next 3 years. The CPUC has also adopted a settlement agreement that includes reforms to the Rule 21 interconnection process to provide a clear, predictable path to interconnection of distributed generation while maintaining the safety and reliability of the grid.
California Strategy to Reduce Petroleum Dependence (AB 2076)	Assembly Bill 2076 (Chapter 936, Statutes of 2000) requires the CEC and the ARB to develop and submit to the Legislature a strategy to reduce petroleum dependence in California. The statute requires the strategy to include goals for reducing the rate of growth in the demand for petroleum fuels. In addition, the strategy is required to include recommendations to increase transportation energy efficiency as well as the use of non-petroleum fuels and advanced transportation technologies including alternative fuel vehicles, hybrid vehicles, and high-fuel efficiency vehicles. The strategy, *Reducing California's Petroleum Dependence*, was adopted by the CEC and ARB in 2003. The strategy recommends that California reduce inroad gasoline and diesel fuel demand to 15 percent below 2003 demand levels by 2020 and maintain that level for the

Table A2-6
Applicable Laws and Regulations for Energy Resources

Regulation	Description
	foreseeable future; the Governor and Legislature work to establish national fuel economy standards that double the fuel efficiency of new cars, light trucks, and sport utility vehicles; and increase the use of nonpetroleum fuels to 20 percent of on-road fuel consumption by 2020 and 30 percent by 2030.
Alternative and Renewable Fuel and Vehicle Technology Program	Assembly Bill 118 (Statues of 2007) created the CEC's Alternative and Renewable Fuel and Vehicle Technology Program. The statute, subsequently amended by Assembly Bill 109 (Statues of 2008), authorizes the CEC to develop and deploy alternative and renewable fuels and advanced transportation technologies to help attain the State's climate change policies.
Alternative Fuels Plan	Assembly Bill 1007 requires the CEC to prepare a state plan to increase the use of alternative fuels in California. Any environmental document prepared for a strategic growth plan, regional blueprint general plan metropolitan planning or transportation plan should include an evaluation of alternative fuels for emissions or criteria pollutants, TACs, GHGs, water pollutants, and other harmful substances, and their impacts on petroleum consumption, and set goals for increased alternative fuel use in the state for the next decades, and recommend policies to ensure the alternative fuel goals are attained, including standards on transportation fuels and vehicle and policy mechanisms to ensure vehicles operating on alternative fuels use those fuels to the maximum extent feasible.
Bioenergy Action Plan (Executive Order S-06-06)	Executive Order S-06-06 establishes targets for the use and production of biofuels and biopower and directs state agencies to work together to advance biomass programs in California while providing environmental protection and mitigation. This executive order establishes the following target to increase the production and use of bioenergy, including ethanol and biodiesel fuels made from renewable resources: produce a minimum of 20 percent of its biofuels within California by 2010, 40 percent by 2020, and 75 percent by 2050. The Executive Order also calls for the state to meet a target for use of biomass electricity.
Governor's Low Carbon Fuel Standard (Executive Order S-01-07)	Executive Order S-01-07 establishes a statewide goal to reduce the carbon intensity of California's transportation fuels by at least 10 percent by 2020 through establishment of the LCFS. The executive order requires LCFS to be incorporated into the State Alternative Fuels Plan required by AB 1007 and is one of the proposed discrete early action GHG reduction measures

Table A2-6 Applicable Laws and Regulations for Energy Resources	
Regulation	**Description**
	identified by CARB pursuant to AB 32. In January, 2010, the Office of Administrative Law approved the LCFS regulation.
Local	
City/County General Plans	Many cities and counties have general plan elements and policies that specifically address energy use and conservation. Those energy conservation measures outlined in the various county and city general plans contain goals, objectives, and policies aimed at reducing energy consumption. Proponents of specific projects would be required to consult the applicable general plans and design the projects consistent with the guidelines of those general plans in which the projects are located.

7. Geology and Soils

Applicable laws and regulations associated with geology and soils are discussed in Table A2-7.

Table A2-7 Applicable Laws and Regulations for Geology and Soils	
Regulation	**Description**
Federal	
Safe Drinking Water Act - Federal Underground Injection Control Class VI Program for Carbon Dioxide Geology Sequestration Wells	Under the Safe Drinking Water Act (SDWA), the Federal Underground Injection Control (UIC) Class VI Program for Carbon Dioxide Geologic Sequestration Wells requires states and owners or operators to submit all permit applications to the appropriate U.S. EPA Region for a Class VI permit to be issued. These requirements, also known as the Class VI rule, are designed to protect underground sources of drinking water. The Class VI rule builds on existing UIC Program requirements, with extensive tailored requirements that address carbon dioxide injection for long-term storage to ensure that wells used for geologic sequestration are appropriately sited, constructed, tested, monitored, funded, and closed. The rule also affords owners or operators injection depth flexibility to address injection in various geologic settings in the United States in which geologic sequestration may occur, including very deep formations and oil and gas fields that are transitioned for use as carbon dioxide storage sites.

Table A2-7 Applicable Laws and Regulations for Geology and Soils	
Regulation	**Description**
Safe Drinking Water Act - Federal Underground Injection Control Class II Program for Oil and Gas Related Injection Wells	The Class II Program for Oil and Gas Related Injection Wells requires states to meet EPA's minimum requirements for UIC programs including strict construction and conversion standards and regular testing and inspection. Enhanced oil and gas recovery wells may either be issued permits or be authorized by rule. Disposal wells are issued permits.
CWA	This law was enacted to restore and maintain the chemical, physical, and biological integrity of the nation's waters by regulating point and nonpoint pollution sources, providing assistance to publicly owned treatment works for the improvement of wastewater treatment, and maintaining the integrity of wetlands. This includes the creation of a system that requires states to establish discharge standards specific to water bodies (National Pollution Discharge Elimination System [NPDES]), which regulates storm water discharge from construction sites through the implementation of a Storm Water Pollution Prevention Plan (SWPPP). In California, the State's NPDES permit program is implemented and administered by the local Regional Water Quality Control Boards.
Earthquake Hazards Reduction Act and National Earthquake Hazards Reduction Program Act	This Act established the National Earthquake Hazards Reduction Program to reduce the risks to life and property from future earthquakes. This program was significantly amended in November 1990 by the National Earthquake Hazards Reduction Program Act by refining the description of agency responsibilities, program goals and objectives.
State	
Seismic Hazards Mapping Act, PRC Section 2690–2699.	The Seismic Hazards Mapping Act (the Act) of 1990 (PRC, Chapter 7.8, Division 2) directs the California DOC, Division of Mines and Geology (now called California Geological Survey [CGS]) to delineate Seismic Hazard Zones. The purpose of the Act is to reduce the threat to public health and safety and to minimize the loss of life and property by identifying and mitigating seismic hazards. These include areas identified that are subject to the effects of strong ground shaking, such as liquefaction, landslides, tsunamis, and seiches. Cities, counties, and state agencies are directed to use seismic hazard zone maps developed by CGS in their land-use planning and permitting processes. The Act requires that site-specific

Table A2-7
Applicable Laws and Regulations for Geology and Soils

Regulation	Description
	geotechnical investigations be performed prior to permitting most urban development projects within seismic hazard zones.
Alquist-Priolo Earthquake Fault Zoning Act	California's Alquist-Priolo Act (PRC 2621 et seq.), originally enacted in 1972 as the Alquist-Priolo Special Studies Zones Act and renamed in 1994, is intended to reduce the risk to life and property from surface fault rupture during earthquakes. The Alquist-Priolo Act prohibits the location of most types of structures intended for human occupancy across the traces of active faults and strictly regulates construction in the corridors along active faults (Earthquake Fault Zones). It also defines criteria for identifying active faults, giving legal weight to terms such as "active," and establishes a process for reviewing building proposals in and adjacent to Earthquake Fault Zones. Under the Alquist-Priolo Act, faults are zoned, and construction along or across them is strictly regulated if they are "sufficiently active" and "well-defined." A fault is considered sufficiently active if one or more of its segments or strands shows evidence of surface displacement during Holocene time (defined for the purposes of the act as within the last 11,000 years). A fault is considered well-defined if its trace can be clearly identified by a trained geologist at the ground surface or in the shallow subsurface, using standard professional techniques, criteria, and judgment.
California Division of Oil, Gas, and Geothermal Resources (DOGGR), PRC Section 3106.	PRC Section 3106 mandates the supervision of drilling, operation, maintenance, and abandonment of oil wells for the purpose of preventing: damage to life, health, property, and natural resources; damage to underground and surface waters suitable for irrigation or domestic use; loss of oil, gas, or reservoir energy; and damage to oil and gas deposits by infiltrating water and other causes. In addition, the DOGGR regulates drilling, production, injection, and gas storage operations in accordance with 14 CCR Chapter 4, Subchapter 1.
Landslide Hazard Identification Program, PRC Section 2687(a)	The Landslide Hazard Identification Program requires the State Geologist to prepare maps of landslide hazards within urbanizing areas. According to PRC Section 2687(a), public agencies are encouraged to use these maps for land use planning and for decisions regarding building, grading, and development permits.

Table A2-7
Applicable Laws and Regulations for Geology and Soils

Regulation	Description
California Building Standards Code (CBSC) (24 CCR)	California's minimum standards for structural design and construction are given in the CBSC (24 CCR). The CBSC is based on the Uniform Building Code (International Code Council 1997), which is used widely throughout United States (generally adopted on a state-by-state or district-by-district basis) and has been modified for California conditions with numerous, more detailed or more stringent regulations. The CBSC provides standards for various aspects of construction, including (i.e., not limited to) excavation, grading, and earthwork construction; fills and embankments; expansive soils; foundation investigations; and liquefaction potential and soil strength loss. In accordance with California law, proponents of specific projects would be required to comply with all provisions of the CBSC for certain aspects of design and construction.
Surface Mining and Reclamation Act (SMARA)	The intent of SMARA of 1975 is to promote production and conservation of mineral resources, minimize environmental effects of mining, and to assure that mined lands will be reclaimed to conditions suitable for alternative uses. An important part of the SMARA legislation requires the State Geologist to classify land according to the presence or absence of significant mineral deposits. Local jurisdictions are given the authority to permit or restrict mining operations, adhering to the SMARA legislation. Classification of an area using MRZs to designate lands that contain mineral deposits are designed to protect mineral deposits from encroaching urbanization and land uses that are incompatible with mining. The MRZ classifications reflect varying degrees of mineral significance, determined by available knowledge of the presence or absence of mineral deposits as well as the economic potential of the deposits.
Local	
Geotechnical Investigation	Local jurisdictions typically regulate construction activities through a process that may require the preparation of a site-specific geotechnical investigation. The purpose of a site-specific geotechnical investigation is to provide a geologic basis for the development of appropriate construction design. Geotechnical investigations typically assess bedrock and Quaternary geology, geologic structure, soils, and the previous history of excavation and fill placement. Proponents of specific projects that require design of earthworks and foundations for proposed structures will need to prepare geotechnical

Table A2-7 Applicable Laws and Regulations for Geology and Soils	
Regulation	**Description**
	investigations on the physical properties of soil and rock at the site prior to project design.
Local Grading and Erosion Control Ordinances	Many counties and cities have grading and erosion control ordinances. These ordinances are intended to control erosion and sedimentation caused by construction activities. A grading permit is typically required for construction-related projects. As part of the permit, project applicants usually must submit a grading and erosion control plan, vicinity and site maps, and other supplemental information. Standard conditions in the grading permit include a description of Best Management Practices similar to those contained in a SWPPP.
City/County General Plans	Most city and county general plans include an element that covers geology, soil, and mineral resources within that jurisdiction.

8. Greenhouse Gases

Applicable laws and regulations specific to the reduction of GHG emissions are listed in Table A2-8 below. It should be noted that other laws and regulations described under Energy Demand in this Environmental Setting would also reduce GHG emissions.

Table A2-8 Applicable Laws and Regulations for Greenhouse Gases	
Regulation	**Description**
Federal	
Mandatory Greenhouse Gas Reporting Rule	On September 22, 2009, U.S. EPA issued a final rule for mandatory reporting of GHGs from large GHG emissions sources in the United States In general, this national reporting requirement will provide U.S. EPA with accurate and timely GHG emissions data from facilities that emit 25,000 metric tons or more of CO_2 per year. This publically available data will allow the reporters to track their own emissions, compare them to similar facilities, and aid in identifying cost effective opportunities to reduce emissions in the future. Reporting is at the facility level, except that certain suppliers of fossil fuels and industrial greenhouse gases along with vehicle and engine manufacturers will report at the corporate level. An estimated 85 percent of the total United States GHG emissions, from approximately 10,000 facilities, are covered by this final rule.

Table A2-8
Applicable Laws and Regulations for Greenhouse Gases

Regulation	Description
National Program to Cut Greenhouse Gas Emissions and Improve Fuel Economy for Cars and Trucks	On September 15, 2009, U.S. EPA and the Department of Transportation's National Highway Traffic Safety Administration (NHTSA) proposed a new national program that would reduce GHG emissions and improve fuel efficiency for all new cars and trucks sold in the U.S. EPA proposed the first-ever national GHG emissions standards under the CAA, and NHTSA proposed CAFE standards under the Energy Policy and Conservation Act. This proposed national program would allow automobile manufacturers to build a single light-duty national fleet that satisfies all requirements under both Federal programs and the standards of California and other states. The President requested that U.S. EPA and NHTSA, on behalf of the Department of Transportation, develop, through notice and comment rulemaking, a coordinated National Program under the CAA and the Energy Policy and Conservation Act (EPCA), as amended by the Energy Independence and Security Act (EISA), to reduce fuel consumption by and GHG emissions of light-duty vehicles for model years 2017-2025. U.S. EPA and NHTSA are developing the proposal based on extensive technical analyses, an examination of the factors required under the respective statutes and on discussions with individual motor vehicle manufacturers and other stakeholders. The National Program would apply to passenger cars, light-duty trucks, and medium-duty passenger vehicles (light-duty vehicles) built in those model years (76 FR 48758). The first part of this program (i.e., 2012-2016) is implemented. The next part (i.e., 2017-2025) is currently in process for which ARB is proposed to accept compliance thereof as also being acceptable for California compliance, similar to what was done for the first part.
Endangerment and Cause or Contribute Findings	On December 7, 2009, U.S. EPA adopted its Proposed Endangerment and Cause or Contribute Findings for Greenhouse Gases under the CAA (Endangerment Finding). The Endangerment Finding is based on Section 202(a) of the CAA, which states that the Administrator (of EPA) should regulate and develop standards for "emission[s] of air pollution from any class of classes of new motor vehicles or new motor vehicle engines, which in [its] judgment cause, or contribute to, air pollution which

Table A2-8
Applicable Laws and Regulations for Greenhouse Gases

Regulation	Description
	may reasonably be anticipated to endanger public health or welfare." The rule addresses Section 202(a) in two distinct findings. The first addresses whether or not the concentrations of the six key GHGs (i.e., carbon dioxide [CO_2], methane, nitrous oxide [N_2O], hydrofluorocarbons [HFCs], perfluorocarbons [PFCs], and sulfur hexafluoride [SF_6]) in the atmosphere threaten the public health and welfare of current and future generations. The second addresses whether or not the combined emissions of GHGs from new motor vehicles and motor vehicle engines contribute to atmospheric concentrations of GHGs and therefore the threat of climate change. The Administrator found that atmospheric concentrations of GHGs endanger the public health and welfare within the meaning of Section 202(a) of the CAA. The evidence supporting this finding consists of human activity resulting in "high atmospheric levels" of GHG emissions, which are very likely responsible for increases in average temperatures and other climatic changes. Furthermore, the observed and projected results of climate change (e.g., higher likelihood of heat waves, wild fires, droughts, sea level rise, and higher intensity storms) are a threat to the public health and welfare. Therefore, GHGs were found to endanger the public health and welfare of current and future generations. The Administrator also found that GHG emissions from new motor vehicles and motor vehicle engines are contributing to air pollution, which is endangering public health and welfare. EPA's final findings respond to the 2007 United States Supreme Court decision that GHGs fit within the CAA definition of air pollutants. The findings do not in and of themselves impose any emission reduction requirements but rather allow U.S. EPA to finalize the GHG standards proposed earlier in 2009 for new light-duty vehicles as part of the joint rulemaking with the Department of Transportation.
Significant New Alternatives Policy	U.S. EPA's Significant New Alternatives Policy (SNAP) program provide an evolving list of alternatives (i.e., chemicals that may replace one that is currently in use for a specific purpose). U.S. EPA makes decisions informed by the overall understanding of the environmental and human health impacts as well as the

Table A2-8 Applicable Laws and Regulations for Greenhouse Gases	
Regulation	**Description**
	current knowledge regarding available substitutes. Where U.S. EPA is determining whether to add a new substitute to the list, U.S. EPA compares the risk posed by the new substitute to the risks posed by other alternatives on the list and determines whether that specific new substitutes poses more risk than already-listed alternatives for the same use. Section 612 of the Clean Air Act provides that U.S. EPA must prohibit the use of a substitute where it has determined that there are other available substitutes that pose less overall risk to human health and the environment.
State	
Executive Order B-30-15	Executive Order B-30-15 established a California GHG reduction target of 40 percent below 1990 levels by 2030. To accomplish this goal, directs state agencies to take measures consistent with their existing authority to reduce greenhouse gas emissions. In addition, the California Air Resources Board will initiate a public process in the summer of 2015 and work closely with other state agencies to update the State's climate change Scoping Plan. The updated Scoping Plan will provide a framework for achieving the 2030 target and will be completed and adopted by the Air Resources Board in 2016. Concurrent planning efforts related to energy efficiency in existing buildings (AB 758), short-lived climate pollutants, sustainable freight, Greenhouse Gas Reduction Fund Investments, forest health, and others will be coordinated with, and feed into, the updated Scoping Plan.
Executive Order S-3-05	Executive Order S-3-05, which was signed by former Governor Schwarzenegger in 2005, proclaims that California is vulnerable to the impacts of climate change. It declares that increased temperatures could reduce the Sierra's snowpack, further exacerbate California's air quality problems, and potentially cause a rise in sea levels. To combat those concerns, the Executive Order established total greenhouse gas emission targets. Specifically, emissions are to be reduced to the 2000 level by 2010, the 1990 level by 2020, and to 80 percent below the 1990 level by 2050. The Executive Order directed the Secretary of the California Environmental Protection Agency (CalEPA) to coordinate a multi-

Table A2-8
Applicable Laws and Regulations for Greenhouse Gases

Regulation	Description
	agency effort to reduce greenhouse gas emissions to the target levels. The Secretary will also submit biannual reports to the governor and state legislature describing: progress made toward reaching the emission targets; impacts of global warming on California's resources; and mitigation and adaptation plans to combat these impacts. To comply with the Executive Order, the Secretary of the Cal/EPA created the Climate Action Team (CAT) made up of members from various state agencies and commission. CAT released its first report in March 2006. The report proposed to achieve the targets by building on voluntary actions of California businesses, local government and community actions, as well as through state incentive and regulatory programs.
Clean Energy and Pollution Reduction Act of 2015 (SB 350, Statues of 2015)	The Clean Energy and Pollution Reduction Act of 2015 requires the amount of electricity generated and sold to retail customers per year from eligible renewable energy resources be increased to 50% by December 31, 2030. This act also requires doubling of the energy efficiency savings in electricity and natural gas for retail customers, through energy efficiency and conservation, by December 31, 2030.
Senate Bill 605, Short-Lived Climate Pollutants	Senate Bill 605 directs ARB to complete a comprehensive strategy to reduce emissions of short-lived climate pollutants in the state through the following actions: (1) Complete an inventory of sources and emissions of short-lived climate pollutants in the state based on available data. (2) Identify research needs to address any data gaps. (3) Identify existing and potential new control measures to reduce emissions. (4) Prioritize the development of new measures for short-lived climate pollutants that offer cobenefits by improving water quality or reducing other air pollutants that impact community health and benefit disadvantaged communities, as identified pursuant to Section 39711. (5) Coordinate with other state agencies and districts to develop measures identified as part of the comprehensive strategy.
Assembly Bill 32, the California Global Warming	In September 2006, former Governor Arnold Schwarzenegger signed AB 32, the California Global Warming Solutions Act of 2006. AB 32 establishes regulatory, reporting, and market

Table A2-8
Applicable Laws and Regulations for Greenhouse Gases

Regulation	Description
Solutions Act, Statutes of 2006	mechanisms to achieve quantifiable reductions in GHG emissions and a cap on statewide GHG emissions. AB 32 requires that statewide GHG emissions be reduced to 1990 levels by 2020. This reduction will be accomplished through an enforceable statewide cap on GHG emissions that was be phased in starting in 2012. To effectively implement the cap, AB 32 directs ARB to develop and implement regulations to reduce statewide GHG emissions from substantial stationary and mobile source categories. Requires ARB to produce a Scoping Plan by 1/1/2009 and at least every 5 years afterwards that details how the state will meet its GHG reduction targets. AB 32 requires that ARB adopt a quantified cap on GHG emissions representing 1990 emissions levels and disclose how it arrives at the cap; institute a schedule to meet the emissions cap; and develop tracking, reporting, and enforcement mechanisms to ensure that the state achieves the reductions in GHG emissions necessary to meet the cap. AB 32 also includes guidance to institute emissions reductions in an economically efficient manner and conditions to ensure that businesses and consumers are not unfairly affected by the reductions.
Assembly Bill 1493, Statutes of 2002	In September 2004, ARB approved regulations to reduce GHG emissions from new motor vehicles. The Board took this action pursuant to Chapter 200, Statutes of 2002 (AB 1493, Pavley) which directed the Board to adopt regulations that achieve the maximum feasible and cost effective reduction in greenhouse gas emissions from motor vehicles. The regulations, which took effect in 2006 following an opportunity for legislative review, apply to new passenger vehicles and light duty trucks beginning with the 2009 model year.
Executive Order S-1-07	Executive Order S-1-07, which was signed by former Governor Schwarzenegger in 2007, proclaims that the transportation sector is the main source of GHG emissions in California, at over 40 percent of statewide emissions. It establishes a goal that the carbon intensity of transportation fuels sold in California should be reduced by a minimum of 10 percent by 2020. This order also directed ARB to determine if this LCFS could be adopted as a discrete early action measure after meeting the mandates in AB 32. ARB adopted the LCFS on April 23, 2009.

Table A2-8
Applicable Laws and Regulations for Greenhouse Gases

Regulation	Description
Senate Bill 1368, Statutes of 2006	SB 1368 is the companion bill of AB 32 and was signed by former Governor Schwarzenegger in September 2006. SB 1368 requires the CPUC to establish a GHG emission performance standard for baseload generation from investor owned utilities by February 1, 2007. The CEC must establish a similar standard for local publicly owned utilities by June 30, 2007. These standards cannot exceed the GHG emission rate from a baseload combined-cycle natural gas fired plant. The legislation further requires that all electricity provided to California, including imported electricity, must be generated from plants that meet the standards set by the CPUC and CEC.
Senate Bill 1078, Statutes of 2002, Senate Bill 107, Statutes of 2006, and SBx1 2	SB 1078 (Chapter 516, Statutes of 2002) requires retail sellers of electricity, including investor-owned utilities and community choice aggregators, to provide at least 20 percent of their supply from renewable sources by 2017. SB 107 (Chapter 464, Statutes of 2006) changed the target date to 2010. In 2010, SBx1 2 was chaptered, which expanded the State's Renewable Portfolio Standard to 33 percent renewable power by 2020.
Senate Bill 97, Statutes of 2007	As directed by SB 97, the Natural Resources Agency adopted Amendments to the CEQA Guidelines for GHG emissions on December 30, 2009. On February 16, 2010, the Office of Administrative Law approved the Amendments, and filed them with the Secretary of State for inclusion in the California Code of Regulations. The Amendments became effective on March 18, 2010.
Senate Bill 375, Statutes of 2008	SB 375, signed in September 2008, aligns regional transportation planning efforts, regional GHG reduction targets, and land use and housing allocation. SB 375 requires Metropolitan Planning Organizations (MPOs) to adopt a Sustainable Communities Strategy (SCS) or Alternative Planning Strategy (APS), which will prescribe land use allocation in that MPO's Regional Transportation Plan (RTP). ARB, in consultation with MPOs, will provide each affected region with reduction targets for GHGs emitted by passenger cars and light trucks in the region for the years 2020 and 2035. These reduction targets will be updated every 8 years, but can be updated every 4 years if advancements in emissions technologies affect the reduction strategies to achieve the targets. ARB is also charged with reviewing each

Table A2-8
Applicable Laws and Regulations for Greenhouse Gases

Regulation	Description
	MPO's SCS or APS for consistency with its assigned targets. If MPOs do not meet the GHG reduction targets, transportation projects would not be eligible for funding programmed after January 1, 2012. This bill also extends the minimum time period for the Regional Housing Needs Allocation (RNHA) cycle from 5 years to 8 years for local governments located within an MPO that meets certain requirements. City or county land use policies (including general plans) are not required to be consistent with the RTP (and associated SCS or APS). However, new provisions of CEQA would incent qualified projects that are consistent with an approved SCS or APS, categorized as "transit priority projects."
Executive Order S-13-08	Sea level rise is a foreseeable indirect environmental impact associated with climate change, largely attributable to thermal expansion of the oceans and melting polar ice. As discussed above in the environmental setting (subheading "Adaptation to Climate Change"), sea level rise presents impacts to California associated with coastal erosion, water supply, water quality, saline-sensitive species and habitat, land use compatibility, and flooding. Former Governor Arnold Schwarzenegger signed Executive Order S-13-08 on November 14, 2008. This executive order directed the California Natural Resources Agency (CNRA) to develop the 2009 California Climate Adaptation Strategy (CNRA 2009)), which summarizes the best known science on climate change impacts in seven distinct sectors—public health, biodiversity and habitat, ocean and coastal resources, water management, agriculture, forest resources, and transportation and energy infrastructure—and provides recommendations on how to manage against those threats. This executive order also directed OPR, in cooperation with the CNRA, to provide land use planning guidance related to sea level rise and other climate change impacts by May 30, 2009, which is also provided in the 2009 California Climate Adaptation Strategy (CNRA 2009) and OPR continues to further refine land use planning guidance related to climate change impacts. Executive Order S-13-08 also directed CNRA to convene an independent panel to complete the first California Sea Level Rise Assessment Report. This report is to be completed no later than December 1, 2010. The report is intended to provide information

Table A2-8
Applicable Laws and Regulations for Greenhouse Gases

Regulation	Description
	on the following: Relative sea level rise projections specific to California, taking into account issues such as coastal erosion rates, tidal impacts, El Niño and La Niña events, storm surge, and land subsidence rates; The range of uncertainty in selected sea level rise projections; A synthesis of existing information on projected sea level rise impacts to state infrastructure (such as roads, public facilities and beaches), natural areas, and coastal and marine ecosystems; and Discussion of future research needs regarding sea level rise for California.
ARB's Landfill Methane Control Measure	The regulation requires owners and operators of certain uncontrolled municipal solid waste landfills to install gas collection and control systems, and requires existing and newly installed gas and control systems to operate in an optimal manner. The regulation allows local air districts to voluntarily enter into agreements with ARB to implement and enforce the regulation and to assess fees to cover costs. Some local air districts have also adopted rules to implement federal standards for the installation of gas collection and control systems.
AB 341 (Chesbro, Chapter 476, Statutes of 2011)	AB 341 (Chesbro, Chapter 476, Statutes of 2011 established a State target to reduce by 75 percent the amount of solid waste sent to landfills by 2020 through recycling, composting, and source reduction practices.
AB 1826 (Chesbro, Chapter 727, Statutes of 2014)	AB 1826 (Chesbro, Chapter 727, Statutes of 2014) requires businesses generating specified amounts of organic wastes to begin arranging for the recycling and diversion of those wastes from landfill disposal beginning in 2016.
Refrigerant Management Plan	The Refrigerant Management Plan requires facilities with refrigeration systems with more than 50 pounds of high-GWP refrigerant to: conduct and report periodic leak inspections; promptly repair leaks; and keep service records on site.
Compliance Offset	Compliance Offset Protocols under the State's Cap-and-Trade

Table A2-8 Applicable Laws and Regulations for Greenhouse Gases	
Regulation	**Description**
Protocols under the State's Cap-and-Trade Program	Program include a livestock protocol, rice cultivation protocol, and mine methane capture protocol. The protocols provide methods to quantify, report, and credit GHG emission reductions from sectors not covered by the Cap-and-Trade Program.
Assembly Bill 1257 (Bocanegra, Chapter 749, Statutes of 2013)	AB 1257 directs the CEC to assemble a report by November 2015 (and every four years after), in consultation with other State agencies, to identify strategies for maximizing the benefits obtained from natural gas as an energy source.
Assembly Bill 1900 (Gatto, Chapter 602, Statutes of 2012)	AB 1900 directed the CPUC to adopt natural gas constituent standards (in consultation with ARB and the Office of Environmental Health and Hazard Assessment). The legislation is also designed to streamline and standardize customer pipeline access rules, and encourage the development of statewide policies and programs to promote all sources of biomethane production and distribution.
Low Carbon Fuel Standard	The Low Carbon Fuel Standard (LCFS) requires transportation fuel providers to procure clean fuels to reduce the carbon intensity of California's fuel mix. The LCFS provides a market signal to incentivize using captured methane as a transportation fuel, among other clean fuel options.
Senate Bill 1122 (Rubio, Chapter 612, Statutes 2012)	Senate Bill 1122 directed the California Public Utility Commission (CPUC) to require the State's investor-owned utilities to develop and offer 10 to 20 year market-price contracts to procure an additional 250 megawatts of cumulative electricity generation from biogas facilities that commence operating on or after June of 2013.

9. Hazards and Hazardous Materials

Applicable laws and regulations associated with hazards and hazardous materials are discussed in Table A2-9.

Table A2-9 Applicable Laws and Regulations for Hazards and Hazardous Materials	
Regulations	**Description**
Federal	

Table A2-9
Applicable Laws and Regulations for Hazards and Hazardous Materials

Regulations	Description
CWA (40 CFR 112)	The 1972 amendments to the CWA provide the statutory basis for the NPDES permit program and the basic structure for regulating the discharge of pollutants from point sources to waters of the United States Section 402 of the CWA specifically required U.S. EPA to develop and implement the NPDES program.
Safe Drinking Water Act (SDWA)	SDWA is the main federal law that ensures the quality of Americans' drinking water. Under SDWA, U.S. EPA sets standards for drinking water quality and oversees the states, localities, and water suppliers who implement those standards. SDWA was originally passed by Congress in 1974 to protect public health by regulating the nation's public drinking water supply. The law was amended in 1986 and 1996 and requires many actions to protect drinking water and its sources: rivers, lakes, reservoirs, springs, and ground water wells. SDWA does not regulate private wells which serve fewer than 25 individuals.
Federal Hazardous Materials Regulations (FHMR) Title 49, Code of Federal Regulations, Parts 100-180	The regulations establish criteria for the safe transport of hazardous materials. Compliance is mandatory for intrastate and interstate transportation.
Toxic Substances Control Act (TSCA) 15 U.S.C. Section 2601 et seq.	TSCA provides U.S. EPA with authority to require reporting, record-keeping and testing requirements, and restrictions relating to chemical substances and/or mixtures. TSCA addresses the production, importation, use, and disposal of specific chemicals including polychlorinated biphenyls (PCBs), asbestos, radon and lead-based paint.
Resource Conservation and Recovery Act (RCRA) 42 U.S.C. Section 6901 et seq. (40 CFR)	RCRA of 1976 gives U.S. EPA the authority to control hazardous waste from the "cradle-to-grave." This includes the generation, transportation, treatment, storage, and disposal of hazardous waste. RCRA also set forth a framework for the management of non-hazardous solid wastes. The 1986 amendments to RCRA enabled U.S. EPA to address environmental problems that could result from underground tanks storing petroleum and other hazardous substances. HSWA - the Federal Hazardous and Solid Waste Amendments - are the 1984 amendments to RCRA that focused on waste minimization and phasing out land disposal of hazardous waste as well as corrective action for releases. Some of the other mandates of this law include increased enforcement authority for EPA, more stringent hazardous waste management

Table A2-9
Applicable Laws and Regulations for Hazards and Hazardous Materials

Regulations	Description
	standards, and a comprehensive underground storage tank program. Federal regulations adopted by U.S. EPA are found in Title 40, Code of Federal Regulations (40 CFR).
Comprehensive Environmental Response, Compensation and Liability Act (CERCLA)	CERCLA, commonly known as Superfund, was enacted by Congress on December 11, 1980. This law created a tax on the chemical and petroleum industries and provided broad Federal authority to respond directly to releases or threatened releases of hazardous substances that may endanger public health or the environment. CERCLA also enabled the revision of the National Contingency Plan (NCP). The NCP provided the guidelines and procedures needed to respond to releases and threatened releases of hazardous substances, pollutants, or contaminants. The NCP also established the NPL. The Superfund Amendments and Reauthorization Act (SARA) of 1986 reauthorized CERCLA to continue cleanup activities around the country. Several site-specific amendments, definitions clarifications, and technical requirements were added to the legislation, including additional enforcement authorities. Also, Title III of SARA authorized the Emergency Planning and Community Right-to-Know Act (EPCRA).
Emergency Planning and Community Right-to-Know Act (EPCRA) (42 USC Section 9601 et seq.)	The SARA of 1986 created EPCRA (40 CFR Parts 350-372), also known as SARA Title III, a statute designed to improve community access to information about chemical hazards and to facilitate the development of chemical emergency response plans by state/tribe and local governments. EPCRA required the establishment of state/tribe emergency response commissions (SERCs/TERCs), responsible for coordinating certain emergency response activities and for appointing local emergency planning committees.
State	
Hazardous Materials Transportation California Vehicle Code Sections 31301-31309	Regulations pertaining to the safe transport of hazardous materials are in California Vehicle Code Sections 31301-31309. All motor carriers and drivers involved in transportation of hazardous materials must comply with the requirements contained in federal and state regulations, and must apply for and obtain a hazardous materials transportation license from the California Highway Patrol. A driver is required to obtain a hazardous materials endorsement issued by the driver's country or state of domicile to operate any commercial vehicle carrying hazardous materials. The driver is required to display placards or markings while hauling hazardous waste, unless the driver is

Table A2-9 Applicable Laws and Regulations for Hazards and Hazardous Materials	
Regulations	**Description**
	exempt from the endorsement requirements. A driver who is a California resident is required to obtain an endorsement from California Highway Patrol.
Hazardous Waste Control Law California Health & Safety Code, Division 20, Chapter 6.5, 22 CCR, Division 4.5	California requirements and statutory responsibilities in managing hazardous waste in California – this includes the generation, transportation, storage, treatment, recycling, and disposal of hazardous waste. The statute and regulation are implemented by Cal/EPA Department of Toxic Substances Control.
California Accidental Release Prevention (CalARP) Program 19 CCR Division 2, Chapter 4.5, Sections 2735-2785	The purpose of the CalARP program is to prevent accidental releases of substances that can cause serious harm to the public and the environment, to minimize the damage if releases do occur, and to satisfy community right-to-know laws. This is accomplished by requiring businesses that handle more than a threshold quantity of a regulated substance listed in the regulations to develop a Risk Management Plan (RMP). An RMP is a detailed engineering analysis of the potential accident factors present at a business and the mitigation measures that can be implemented to reduce this accident potential.
Hazardous Material Business Plan & Area Plan Program Health and Safety Code Sections 25500 – 25520 19 CCR, Division 2, Chapter 4, Article 3 & 4	The business and area plans program, relating to the handling and release or threatened release of hazardous materials, was established in California to protect the public health and safety and the environment. Basic information on the location, type, quantity, and the health risks of hazardous materials handled, used, stored, or disposed of in the state, which could be accidently released into the environment, is not now available to firefighters, health officials, planners, public safety officers, health care providers, regulatory agencies, and other interested persons. The information provided by business and area plans is necessary in order to prevent or mitigate the damage to the health and safety of persons and the environment from the release or threatened release of hazardous materials into the workplace and environment. Certified Unified Program Agencies (CUPAs) use information collected from the Business Plan and CalARP programs to identify hazardous materials in their communities. This information provides the basis for the Area Plan and is used to determine the appropriate level of emergency planning necessary to respond to a release.
Unified Program	A CUPA, which is authorized by the Secretary of Cal/EPA to carry

Table A2-9 Applicable Laws and Regulations for Hazards and Hazardous Materials	
Regulations	**Description**
Administration Health and Safety Code, Chapter 6.11, Sections 25404-25404.8 27 CCR, Division 1, Subdivision 4, Chapter 1, Sections 15100-15620	out several of the hazardous waste/hazardous materials regulatory programs administered by the State in a coordinated and consistent manner. The six hazardous waste and materials program elements covered by the CUPA include: 1) Hazardous Waste Generators 2) Underground Tanks 3) Above Ground Tanks 4) Accidental Release Program 5) Hazardous Material Release Response Plans & Spill Notification 6) Hazardous Materials Management Plans & Inventory Reporting The intent of the CUPA is to simplify the hazardous materials regulatory environment and provide a single point of contact for businesses to address inspection, permitting, billing, and enforcement issues.
Fuels and Fuel Additive Program (40 CFR 79)	U.S. EPA regulates diesel fuels under two programs; one is administered under the Office of Pollution Prevention and Toxic Substances (OPPTS) and the other is administered under the Transportation and Air Quality group. The OPPTS requires that all chemicals produced in the United States are registered with the Toxic Substances Control Act. The Transportation and Air Quality group requires that any fuels sold for ground transportation purposes must be registered with U.S. EPA and the volumes reported on a quarterly basis.
Local	
Various Local Ordinances	Various ordinances and codes may be adopted at the local level to provide stricter requirements in the management of hazardous materials and waste activities within the jurisdiction.

10. Hydrology and Water Quality

Applicable laws and regulations associated with hydrology, water quality, and water supply are discussed in Table A2-10.

Table A2-10 Applicable Laws and Regulations for Hydrology, Water Quality, and Water Supply	
Regulation	**Description**
Federal	

Table A2-10
Applicable Laws and Regulations for Hydrology, Water Quality, and Water Supply

Regulation	Description
National Flood Insurance Program (FEMA)	Designated floodplain mapping program, flooding and flood hazard reduction implementation, and federal subsidized flood insurance for residential and commercial property. Administered by the FEMA.
Executive Order 11988	Requires actions to be taken for federal activities to reduce the risks of flood losses, restore and preserve floodplains, and minimize flooding impacts to human health and safety.
CWA	Administered primarily by the EPA. Pertains to water quality standards, state responsibilities, and discharges of waste to waters of the U.S. Sections 303, 401, 402, and 404.
CWA Section 303	Defines water quality standards consisting of: 1) designated beneficial uses of a water, 2) the water quality criteria (or "objectives" in California) necessary to support the uses, and 3) an antidegradation policy that protects existing uses and high water quality. Section 303(d) requires states to identify water quality impairments where conventional control methods will not achieve compliance with the standards, and establish Total Maximum Daily Load (TMDL) programs to achieve compliance.
CWA Section 401	State certification system for federal actions which may impose conditions on a project to ensure compliance with water quality standards.
CWA Section 402	Section 402 mandates permits for municipal stormwater discharges, which are regulated under the NPDES General Permit for Municipal Separate Storm Sewer Systems (MS4) (MS4 Permit). Several of the cities and counties issue their own NPDES municipal stormwater permits for the regulations of stormwater discharges. These permits require that controls are implemented to reduce the discharge of pollutants in stormwater discharges to the maximum extent possible, including management practices, control techniques, system design and engineering methods, and other measures as appropriate. As part of permit compliance, these permit holders have created Stormwater Management Plans for their respective locations. These plans outline the requirements for municipal operations, industrial and commercial businesses, construction sites, and planning and land development. These requirements may include multiple measures to control pollutants in stormwater discharge. During implementation of specific projects, applicants will be required to follow the

Table A2-10
Applicable Laws and Regulations for Hydrology, Water Quality, and Water Supply

Regulation	Description
	guidance contained in the Stormwater Management Plans as defined by the permit holder in that location.
CWA Section 404	Permit system for dredging or filling activity in waters of the United States, including wetlands, and administered by USACE.
National Toxics Rule and California Toxics Rule	Applicable receiving water quality criteria promulgated by U.S. EPA for priority toxic pollutants consisting generally of trace metals, synthetic organic compounds, and pesticides.
State	
California Water Rights	The SWRCB administers review, assessment, and approval of appropriative (or priority) surface water rights permits/licenses for diversion and storage for beneficial use. Riparian water rights apply to the land and allow diversion of natural flows for beneficial uses without a permit, but users must share the resources equitably during drought. Groundwater management planning is a function of local government. Groundwater use by overlying property owners is not formally regulated, except in cases where the groundwater basin supplies are limited and uses have been adjudicated, or through appropriative procedures for groundwater transfers.
Public Trust Doctrine	Body of common law that requires the state to consider additional terms and conditions when issuing or reconsidering appropriative water rights to balance the use of the water for many beneficial uses irrespective of the water rights that have been established. Public trust resources have traditionally included navigation, commerce, and fishing and have expanded over the years to include protection of fish and wildlife, and preservation goals for scientific study, scenic qualities, and open-space uses.
Porter-Cologne Water Quality Control Act and California Water Code (Title 23)	The SWRCB is responsible for statewide water quality policy development and exercises the powers delegated to the State by the federal government under the CWA. Nine RWQCBs adopt and implement water quality control plans (Basin Plans) which designate beneficial uses of surface waters and groundwater aquifers, and establish numeric and narrative water quality objectives for beneficial use protection. RWQCBs issue waste discharge requirements for discharge activities to water and land, require monitoring and maintain reporting programs, and implement enforcement and compliance policies and procedures. Other state agencies with jurisdiction in water

Table A2-10
Applicable Laws and Regulations for Hydrology, Water Quality, and Water Supply

Regulation	Description
	quality regulation in California include the Department of Public Health (drinking water regulations), Department of Pesticide Regulation, Department of Toxic Substances Control, CDFW, and the Office of Environmental Health and Hazard Assessment.
Policy for Implementation of Toxics Standards for Inland Surface Waters, Enclosed Bays, and Estuaries of California	Commonly referred to as the State Implementation Policy (or SIP), the SIP provides implementation procedures for discharges of toxic pollutants to receiving waters.
Thermal Plan	The Water Quality Control Plan for Control of Temperature in the Coastal and Interstate Water and Enclosed Bays and Estuaries of California was adopted by the SWRCB in 1972 and amended in 1975. The Thermal Plan restricts discharges of thermal waste or elevated temperature waste to waters of the state. Generally, the Thermal Plan prohibits discharges from increasing ambient temperatures by more than 1ºF over more than 25 percent of a stream cross section, increasing ambient temperatures by more than 4ºF in any location, and prohibits discharge of waste that exceeds more than 20ºF above the ambient temperature.
Statewide NPDES General Permit for Stormwater Associated with Land Disturbance and Construction Activity (Order No. 2009-0009-DWQ, NPDES No. CAR000002)	NPDES permit for stormwater and non-storm discharges from construction activity that disturbs greater than 1 acre. The general construction permit requires the preparation of a SWPPP that identifies BMPs to be implemented to control pollution of storm water runoff. The permit specifies minimum construction BMPs based on a risk-level determination of the potential of the project site to contribute to erosion and sediment transport and sensitivity of receiving waters to sediment. While small amounts of construction-related dewatering are covered under the General Construction Permit, the RWQCB has also adopted a General Order for Dewatering and Other Low Threat Discharges to Surface Waters (General Dewatering Permit). This permit applies to various categories of dewatering activities and may apply to some construction sites, if construction of specific projects required dewatering in greater quantities than that allowed by the General

Table A2-10
Applicable Laws and Regulations for Hydrology, Water Quality, and Water Supply

Regulation	Description
	Construction Permit and discharged the effluent to surface waters. The General Dewatering Permit contains waste discharge limitations and prohibitions similar to those in the General Construction Permit.
Statewide NPDES General Permit for Discharges of Stormwater Associated with Industrial Facilities (Order No. 97-003-DWQ, NPDES No. CAS000001)	NPDES permit for stormwater and non-storm discharges from types of industrial sites based on the Standard Industrial Classification. The general industrial permit requires the preparation of a SWPPP that identifies potential onsite pollutants, BMPs to be implemented, and inspection/monitoring.
Senate Bill 1168	This bill requires all groundwater basins designated as high- or medium-priority basins by DWR that are designated as basins subject to critical conditions of overdraft to be managed under a groundwater sustainability plan or coordinated groundwater sustainability plans by January 31, 2020, and requires all other groundwater basins designated as high- or medium-priority basins to be managed under a groundwater sustainability plan or coordinated groundwater sustainability plans by January 31, 2022. This bill would require a groundwater sustainability plan to be developed and implemented to meet the sustainability goal, established as prescribed, and would require the plan to include prescribed components.
Assembly Bill 1739	This bill establishes groundwater reporting requirements for a person extracting groundwater in an area within a basin that is not within the management area of a groundwater sustainability agency or a probationary basin. The bill requires the reports to be submitted to the SWRCB or, in certain areas, to an entity designated as a local agency by the SWRCB.
Senate Bill 1319	This bill allows the SWRCB to designate a groundwater basin as a probationary basin subject to sustainable groundwater management requirements. This bill also authorizes SWRCB to develop an interim management plan in consultation with the DWR under specified conditions.
Mining and Mineral Policy Act	The Mining and Mineral Act of 1970 declared that the Federal Government policy is to encourage private enterprise in the development of a sound and stable domestic mineral industry, domestic mineral deposits, minerals research, and methods for

Table A2-10 Applicable Laws and Regulations for Hydrology, Water Quality, and Water Supply	
Regulation	**Description**
	reclamation in the minerals industry.
Local	
Water Agencies	Water agencies enter into contracts or agreements with the federal and state governments to protect the water supply and to ensure the lands within the agency have a dependable supply of suitable quality water to meet present and future needs.
Floodplain Management	General plans guide county land use decisions, and require the identification of water resource protection goals, objectives, and policies. Floodplain management is addressed through ordinances, land use planning, and development design review and approval. Local actions may be coordinated with FEMA for the National Flood Insurance Program. Typical provisions address floodplain use restrictions, flood protection requirement, allowable alteration of floodplains and stream channels, control of fill and grading activities in floodplains, and prevention of flood diversions where flows would increase flood hazards in other areas.
Drainage, Grading, and Erosion Control Ordinances	Counties regulate building activity under the federal Uniform Building Code, local ordinances, and related development design review, approval, and permitting. Local ordinances are common for water quality protection addressing drainage, stormwater management, land grading, and erosion and sedimentation control.
Environmental Health	The RWQCBs generally delegate permit authority to county health departments to regulate the construction and operation/maintenance of on-site sewage disposal systems (e.g., septic systems and leach fields, cesspools).

11. Land Use and Planning

Applicable laws and regulations associated with land use and planning are discussed in Table A2-11.

Table A2-11 Applicable Laws and Regulations for Land Use and Planning	
Regulation	**Description**
Federal	
FLPMA	FLPMA is the principal law governing how the BLM manages public lands. FLPMA requires the BLM to manage public land

Table A2-11
Applicable Laws and Regulations for Land Use and Planning

Regulation	Description
	resources for multiple use and sustained yield for both present and future generations. Under FLPMA, the BLM is authorized to grant right-of-ways for generation, transmission, and distribution of electrical energy. Although local agencies do not have jurisdiction over the federal lands managed by the BLM, under FLPMA and the BLM regulations at 43 CFR Part 1600, the BLM must coordinate its planning efforts with state and local planning initiatives. FLPMA defines an Area of Critical Environmental Concern (ACEC) as an area within the public lands where special management attention is required (when such areas are developed or used or where no development is required) to protect and prevent irreparable damage to important historic, cultural, or scenic values, fish and wildlife resources, or other natural systems or processes, or to protect life and safety from natural hazards. The BLM identifies, evaluates, and designates ACECs through its resource management planning process. Allowable management practices and uses, mitigation, and use limitations, if any, are described in the planning document and the concurrent or subsequent ACEC Management Plan. ACECs are considered land use authorization avoidance areas because they are known to contain resource values that could result in denial of applications for land uses that cannot be designed to be compatible with management objectives and prescriptions for the ACEC.
BLM Resource Management Plans	Established by FLPMA, Resource Management Plans are designed to protect present and future land uses and to identify management practices needed to achieve desired conditions within the management area covered by the Resource Management Plans. Management direction is set forth in the Resource Management Plans in the form of goals, objectives, standards, and guidelines. These, in turn, direct management actions, activities, and uses that affect land management, and water, recreation, visual, natural, and cultural resources.
National Forest Management Act (NFMA)	NFMA is the primary statute governing the administration of national forests. The act requires the Secretary of Agriculture to assess forest lands, develop a management program based on multiple-use, sustained-yield principles, and implement a resource management plan for each unit of the National Forest System. Goal 4 of the USFS's National Strategic Plan for the National Forests states that the nation's forests and grasslands play a significant role in meeting America's need for producing

Table A2-11
Applicable Laws and Regulations for Land Use and Planning

Regulation	Description
	and transmitting energy. Unless otherwise restricted, National Forest Service lands are available for energy exploration, development, and infrastructure (e.g., well sites, pipelines, and transmission lines). However, the emphasis on non-recreational special uses, such as utility corridors, is to authorize the special uses only when they cannot be reasonably accommodated on non-National Forest Service lands.
State	
State Planning and Zoning Law	California Government Code section 65300 et seq. establishes the obligation of cities and counties to adopt and implement general plans. The general plan is a comprehensive, long-term, and general document that describes plans for the physical development of the city or county. The general plan addresses a broad range of topics, including, at a minimum, land use, circulation, housing, conservation, open space, noise, and safety. In addressing these topics, the general plan identifies the goals, objectives, policies, principles, standards, and plan proposals that support the city or county's vision for the area. The general plan is also a long-range document that typically addresses the physical character of an area over a 20-year period. Although the general plan serves as a blueprint for future development and identifies the overall vision for the planning area, it remains general enough to allow for flexibility in the approach taken to achieve the plan's goals.
Subdivision Map Act (Government Code section 66410 et seq.)	In general, land cannot be divided in California without local government approval. The primary goals of the Subdivision Map Act are: (a) to encourage orderly community development by providing for the regulation and control of the design and improvements of the subdivision with a proper consideration of its relation to adjoining areas; (b) to ensure that the areas within the subdivision that are dedicated for public purposes will be properly improved by the subdivider so that they will not become an undue burden on the community; and (c) to protect the public and individual transferees from fraud and exploitation. (61 Ops. Cal.Atty. Gen. 299, 301 [1978]; 77 Ops. Cal.Atty. Gen. 185 [1994]). Dividing land for sale, lease or financing is regulated by local ordinances based on the state Subdivision Map Act (Government Code section 66410 et seq.).
Local	
General Plans	The most comprehensive land use planning is provided by city and county general plans, which local governments are required

Table A2-11 Applicable Laws and Regulations for Land Use and Planning	
Regulation	**Description**
	by State law to prepare as a guide for future development. The general plan contains goals and policies concerning topics that are mandated by state law or which the jurisdiction has chosen to include. Required topics are: land use, circulation, housing, conservation, open space, noise, and safety. Other topics that local governments frequently choose to address are public facilities, parks and recreation, community design, or growth management, among others. City and county general plans must be consistent with each other. County general plans must cover areas not included by city general plans (i.e., unincorporated areas).
Specific and Community Plans	A city or county may also provide land use planning by developing community or specific plans for smaller, more specific areas within their jurisdiction. These more localized plans provide for focused guidance for developing a specific area, with development standards tailored to the area, as well as systematic implementation of the general plan. Specific and community plans are required to be consistent with the city or county's general plan.
Zoning	The city or county zoning code is the set of detailed requirements that implement the general plan policies at the level of the individual parcel. The zoning code presents standards for different uses and identifies which uses are allowed in the various zoning districts of the jurisdiction. Since 1971, state law has required the city or county zoning code to be consistent with the jurisdiction's general plan, except in charter cities.

12. Noise

Applicable laws and regulations associated with noise are discussed in Table A2-12.

Table A2-12 Applicable Laws and Regulations for Noise	
Regulation	**Description**
Federal	
Federal Noise Control Act (1972) EPA (40 CFR 201-211)	This act established a requirement that all federal agencies administer their programs to promote an environment free of noise that jeopardizes public health or welfare. U.S. EPA was given the responsibility for providing information to the public regarding identifiable effects of noise on public health or welfare, publishing information on the levels of environmental

Table A2-12
Applicable Laws and Regulations for Noise

Regulation	Description
	noise that will protect the public health and welfare with an adequate margin of safety, coordinating federal research and activities related to noise control, and establishing federal noise emission standards for selected products distributed in interstate commerce. This act also directed that all federal agencies comply with applicable federal, state, interstate, and local noise control regulations.
Quiet Communities Act (1978)	This act promotes the development of effective state and local noise control programs, to provide funds for noise research, and to produce and disseminate educational materials to the public on the harmful effects of noise and ways to effectively control it.
14 CFR, Part 150 (FAA)	These address airport noise compatibility planning and include a system for measuring airport noise impacts and present guidelines for identifying incompatible land uses. All land uses are considered compatible with noise levels of less than 65 dBA L_{dn}. At higher noise levels, selected land uses are also deemed acceptable, depending on the nature of the use and the degree of structural noise attenuation provided.
International Standards and Recommended Practices (International Civil Aviation Organization)	This contains policies and procedures for considering environmental impacts (e.g., aircraft noise emission standards and atmospheric sound attenuation factors).
32 CFR, Part 256 (Department of Defense Air Installations Compatible Use Zones [AICUZ] Program)	AICUZ plans prepared for individual airfields are primarily intended as recommendations to local communities regarding the importance of maintaining land uses which are compatible with the noise and safety impacts of military aircraft operations.
23 CFR, Part 772, Federal Highway Administration (FHWA) standards, policies, and procedures	FHWA standards, policies, and procedures provide procedures for noise studies and noise abatement measures to help protect the public health and welfare, to supply noise abatement criteria, and to establish requirements for information to be given to local officials for use in the planning and design of highways.
29 CFR, Part 1910, Section 1910.95 (U.S. Department of	This regulation established a standard for noise exposure in the workplace.

Table A2-12 Applicable Laws and Regulations for Noise	
Regulation	**Description**
Labor Occupational Safety and Health Administration [OSHA])	
FTA Guidance	This guidance presents procedures for predicting and assessing noise and vibration impacts of proposed mass transit projects. All types of bus and rail projects are covered. Procedures for assessing noise and vibration impacts are provided for different stages of project development, from early planning before mode and alignment have been selected through preliminary engineering and final design. Both for noise and vibration, there are three levels of analysis described. The framework acts as a screening process, reserving detailed analysis for projects with the greatest potential for impacts while allowing a simpler process for projects with little or no effects. This guidance contains noise and vibration impact criteria that are used to assess the magnitude of predicted impacts. A range of mitigation is described for dealing with adverse noise and vibration impacts.
49 CFR 210 (Federal Rail Administration [FRA] Railroad Noise Emission Compliance Standards) and FRA Guidance (2005)	This section and guidance provides contains criteria and procedures for use in analyzing the potential noise and vibration impacts of various types of high-speed fixed guideway transportation systems.
State	
CPUC Section 21670	The State Aeronautics Act of the CPUC establishes statewide requirements for airport land use compatibility planning and requires nearly every county to create an Airport Land Use Commission or other alternative.
Section 5000 et seq. (21 CCR Division 2.5, Chapter 6), California Airport Noise Regulations promulgated in accordance with the	In Section 5006, the regulations state that: "The level of noise acceptable to a reasonable person residing in the vicinity of an airport is established as a CNEL value of 65 dBA for purposes of these regulations. This criterion level has been chosen for reasonable persons residing in urban residential areas where houses are of typical California construction and may have windows partially open. It has been selected with reference to speech, sleep, and community reaction.

Table A2-12 Applicable Laws and Regulations for Noise	
Regulation	**Description**
State Aeronautics Act	
24 CCR, Part 2	These establish standards governing interior noise levels that apply to all new single-family and multi-family residential units in California. These standards require that acoustical studies be performed before construction at building locations where the existing L_{dn} exceeds 60 dBA. Such acoustical studies are required to establish mitigation that will limit maximum Ldn levels to 45 dBA in any habitable room.

13. Population, Employment, and Housing

See land use planning and housing-related regulations in Section 11.0, Land Use and Planning.

14. Public Services

Applicable laws and regulations associated with public services are discussed in Table A2-13.

Table A2-13 Applicable Laws and Regulations for Public Services	
Regulation	**Description**
Federal	**None applicable.**
American with Disabilities Act	Guidelines to ensure that facilities are accessible to individuals with disabilities. Implements requirements for the design and construction of buildings.
State	
State Fire Responsibility Areas	Areas delineated by the CAL FIRE for which the state assumes primary financial responsibility for protecting natural resources from damages of fire. Local jurisdictions are required to adopt minimum recommended requirements for road design, road identification, emergency fire suppression and fuel breaks and greenbelts. All projects within or adjacent to a State Fire Responsibility Area must meet these requirements.
State School Funding	Education Code Section 17620 authorizes school districts to levy a fee, charge, dedication, or other requirement for any development project for the construction or reconstruction of school facilities.

15. Recreation

Applicable laws and regulations associated with recreation are discussed in Table A2-14.

Table A2-14
Applicable Laws and Regulations for Recreation

Regulation	Description
Federal	
FLPMA, 1976 – 43 CFR 1600	Establishes public land policy; guidelines for administration; and provides for the "multiple use" management, protection, development, and enhancement of public lands. Multiple use management, defined as "management of the public lands and their various resource values so that they are utilized in the combination that will best meet the present and future needs of the American people" with recreation identified as one of the resource values.
State	
	None applicable
Local	
General Plans	General plans for cities and counties contain designations for recreational areas. These are policy documents with planned land use maps and related information that are designed to give long-range guidance to those local officials making decisions affecting the growth and resources of their jurisdictions. Because of the number and variety of general plans and related local plans, they are not listed individually.

16. Transportation, Traffic, and Shipping

Applicable laws and regulations associated with transportation and traffic are discussed in Table A2-15.

Table A2-15
Applicable Laws and Regulations for Transportation and Traffic

Regulation	Description
Federal	
40 CFR, Part 77 (FAA)	Requires a determination of no hazard to air navigation for structures that will be more than 200 feet above ground level.
State	
California Vehicle Code (VC) Sections 353; 2500-2505; 31303-31309; 32000-32053; 32100-	Regulates the highway transport of hazardous materials.

Table A2-15 Applicable Laws and Regulations for Transportation and Traffic	
Regulation	**Description**
32109; 31600-31620; California Health and Safety Code Section 25160 et seq.	
VC Sections 13369; 15275 and 15278	Addresses the licensing of drivers and the classification of licenses required for the operation of particular types of vehicles and also requires certificates permitting operation of vehicles transporting hazardous materials.
VC Sections 35100 et seq.; 35250 et seq.; 35400 et seq.	Specifies limits for vehicle width, height, and length.
VC Section 35780	Requires permits for any load exceeding Caltrans weight, length, or width standards on public roadways.
California Streets and Highways Code Section 117, 660-672	Requires permits for any load exceeding Caltrans weight, length, or width standards on County roads.
California Streets and Highways Code Sections 117, 660-670, 1450, 1460 et seq., and 1480 et seq.	Regulate permits from Caltrans for any roadway encroachment from facilities that require construction, maintenance, or repairs on or across State highways and County roads.

17. Utilities and Service Systems

Applicable laws and regulations associated with utilities are discussed in Table A2-16.

Table A2-16 Applicable Laws and Regulations for Utilities	
Regulation	**Description**
Federal	
Federal Power Act of 1935	In the Federal Power Act of 1935 (49 Stat. 803), created the Federal Power Commission, an independent regulatory agency with authority over both the interstate transmission of electricity and the sale of hydroelectric power at the wholesale level. The act requires the commission to ensure that electricity rates are "reasonable, nondiscriminatory and just to the consumer." The Federal Power Act of 1935 also amended the criteria that the commission must apply in deciding whether to license the construction and operation of new hydroelectric facilities.

Table A2-16 Applicable Laws and Regulations for Utilities	
Regulation	**Description**
Natural Gas Act of 1938	Together with the Federal Power Act of 1935, the Natural Gas Act of 1938 (NGA) (P.L. 75-688, 52 Stat. 821) was an essential piece of energy legislation in the first half of the 20th century. These statutes regulated interstate activities of the electric and natural gas industries, respectively. The acts are similarly structured and constitute the classic form of command-and-control regulation authorizing the federal government to enter into a regulatory compact with utilities. In short, the Natural Gas Act enabled federal regulators to set prices for gas sold in interstate commerce in exchange for exclusive rights to transport the gas.
Natural Gas Policy Act of 1978	The Natural Gas Policy Act of 1978 (NGPA) granted the FERC authority over intrastate as well as interstate natural gas production. The NGPA established price ceilings for wellhead first sales of gas that vary with the applicable gas category and gradually increase over time.
State	
Waste Heat and Carbon Emissions Reduction Act of 2007	The Waste Heat and Carbon Emissions Reduction Act of 2007 (AB 1613), placed requirements on the CPUC, the CEC, and local electric utilities to develop incentive programs and technical efficiency guidelines to encourage the installation of small CHP systems. The CEC approved efficiency and certification guidelines for eligible systems under AB 1613 in January 2010, and the CPUC approved standardized contracting and pricing provisions between CHP operators and the Investor Owned Utilities in November 2012.
Assembly Bill 1900 (Gatto, Chapter 602, Statutes of 2012)	AB 1900 directed the CPUC to adopt natural gas constituent standards (in consultation with ARB and the Office of Environmental Health and Hazard Assessment). The legislation is also designed to streamline and standardize customer pipeline access rules, and encourage the development of statewide policies and programs to promote all sources of biomethane production and distribution.
Section 21151.9 of the PRC/ Section 10910 et seq. of the Water Code	Required the preparation of a water supply assessment (WSA) for large developments. These assessments are prepared by public water agencies responsible for providing service and address whether there are adequate existing and projected future water supplies to serve the proposed project. All projects that meet the qualifications for preparing a WSA must identify the water supplies and quantities that would serve the project

Table A2-16 Applicable Laws and Regulations for Utilities	
Regulation	**Description**
	as well as project the total water demand for the service area (including the project's water demands) by source in 5-year increments over a 20-year period. This information must include data for a normal, single-dry, and multiple-dry years. The WSA is required to be approved by the water service agency before the project can be implemented.

B. CANADA REGULATORY SETTING

In Canada, each level of government has powers to protect the environment. This shared nature of environmental jurisdiction makes close cooperation among the federal, provincial, territorial and Aboriginal governments important to Canada's environmental well-being.

Canada is intricately linked to other countries around the globe economically, environmentally and socially. While global and regional environmental problems impact on Canada's vast geography (e.g., ozone depletion, persistent organic pollutants, climate change), Canada also has a responsibility to reduce its contributions to these problems. Canada has a long history of international cooperation across a broad range of environmental issues. Arrangements range from informal sharing of information to the adoption of formal cooperative agreements to achieve common goals. CEPA 1999 provides the means and opportunity to cooperate with international governments to achieve Canada's environmental policy and regulatory goals.

The Department of the Environment was first established by the Department of the Environment Act in 1971. Today, Environment Canada administers nearly two dozen acts either in whole or in part. It also assists with the administration of many others.

Environment Canada uses regulations to place strict controls on areas governed by these acts. It also enters into voluntary and regulated agreements with individuals or multiple parties in Canada and elsewhere to define mutual commitments, roles and responsibilities and actions on specific environmental issues. Relevant Canadian federal laws and regulation are shown in Table A2-17. Relevant laws and regulations specific to Ontario, Canada are shown in Table A2-18.

Table A2-17
Summary of Canadian Federal Laws and Regulation

Affected Resource	Law/Regulation	Adoption Date/Current To	Responsible Agency	Summary
Federal Acts				
General	Canadian Environmental Protection Act (CEPA), 1999	March 31, 2000	Minister of the Environment and Minister of Health	Within the federal government, CEPA 1999 is the primary element of the legislative framework for protecting the Canadian environment and human health. A key aspect of CEPA 1999 is the prevention and management of risks posed by toxic and other harmful substances. CEPA 1999 also manages environmental and human health impacts of products of biotechnology, marine pollution, disposal at sea, vehicle, engine and equipment emissions, fuels, hazardous wastes, environmental emergencies and other sources of pollution. The Minister of the Environment is accountable to Parliament for the administration of all of CEPA 1999. Both the Minister of the Environment and the Minister of Health jointly administer the task of assessing and managing the risks associated with toxic substances.
General	Environmental Enforcement Act	March 23, 2009	Environment Canada	An Act to make amendments relating to the enforcement of, and to enact provisions respecting the enforcement of, certain Acts that relate to the environment. Intended to ensure more effective enforcement of the laws that protect our national parks, our air, our land, our water, and Canadian wildlife. The Act addresses the shortcomings of existing laws and puts in place a stronger enforcement regime that

Table A2-17
Summary of Canadian Federal Laws and Regulation

Affected Resource	Law/Regulation	Adoption Date/Current To	Responsible Agency	Summary
				Canadians want for the protection of their environment and their health. It introduces stiffer fines and new sentencing powers and considerations, and strengthens the government's ability to investigate and prosecute infractions to give Canadians an effective environmental enforcement regime. The legislative changes are accompanied by a range of other complementary measures as well.
General	Canada-Ontario, Agreement Respecting the Great Lakes Basin Ecosystem	Signed June 2007 Extended to March 31, 2011	Environment Canada	The Canada-Ontario Agreement Respecting the Great Lakes Basin Ecosystem is the federal-provincial agreement that supports the restoration and protection of the Great Lakes Basin Ecosystem. The Agreement outlines how the governments of Canada and Ontario, Canada will cooperate and coordinate their efforts to restore, protect and conserve the Great Lakes Basin Ecosystem. It is the means by which the federal partners of the Canadian Federal Great Lakes Program interact with the provincial ministries to help meet Canada's obligations under the Canada-US Great Lakes Water Quality Agreement (GLWQA).
General	Great Lakes Water Quality Agreement	Signed in 1972 Revised in 1978 Amended 1987 Currently under	Environment Canada	The Great Lakes Water Quality Agreement (GLWQA) expresses the commitment of Canada and the United States to restore and maintain the chemical, physical and biological integrity of

Table A2-17
Summary of Canadian Federal Laws and Regulation

Affected Resource	Law/Regulation	Adoption Date/Current To	Responsible Agency	Summary
		negotiations for amendment.		the Great Lakes basin ecosystem, and includes a number of objectives and guidelines to achieve these goals. The Agreement reaffirms the rights and obligation of Canada and the United States under the Boundary Waters Treaty.
General	Environmental Performance Agreements	Various	Environment Canada	Environment Canada uses a range of tools to protect the environment, including non-regulatory agreements with industry that commit certain sectors or companies to specific challenges or performance levels. Each agreement is negotiated around the key principles and design criteria outlined in Environment Canada's *Policy Framework for Environmental Performance Agreements*.
General	Canadian Environmental Assessment Act	1992 Act current to April 2, 2012 Last amended on July 12, 2010	Environment Canada	Ensures that the environmental effects of various projects are carefully reviewed before action is taken in order to avoid significant adverse environmental effects.
Aesthetics	Addressed within other laws and regulations.			
Agricultural and Forest Resources	Addressed within other laws and regulations.			
Air Quality	Canada-Wide Standards	January 1998	Health Canada	Canadian Environment Ministers (with the exception of Québec) signed the Canada-Wide

Table A2-17
Summary of Canadian Federal Laws and Regulation

Affected Resource	Law/Regulation	Adoption Date/Current To	Responsible Agency	Summary
				Accord on Environmental Harmonization and its sub-agreement on Canada-Wide Standards (CWS). The CWS provide an alternative regulatory tool for the management of environmental issues of national interest. CWSs are intended to be achievable targets that will reduce health and environmental risks within a specific timeframe. Departments have integrated the NAAQOs (National Ambient Air Quality Objectives) and CWS processes. Air pollutants that have been identified by governments as needing to be managed will be targeted for either CWS or NAAQOs development, not both. CWS are considered Environmental Quality Objectives under CEPA 1999. Airbornes particles (or particulate matter) and ground-level ozone have been identified as priority substances for the development of CWS under the Harmonization agreement and standards have been announced June 2000 for Ozone and PM2.5.
Air Quality	National Ambient Air Quality Objectives (NAAQOs)	1992	Health Canada	National Ambient Air Quality Objectives (NAAQOs) identify benchmark levels of protection for people and the environment. NAAQOs guide federal/ provincial/ territorial and

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				regional governments in making risk-management decisions, playing an important role in air quality management (e.g. local source permitting, for air quality index and as benchmarks for developing provincial objectives and standards). NAAQOs are viewed as effects-based long-term air quality goals. The air quality objectives must be consistent with the philosophy of the CEPA 1999, and must be based on recognized scientific principles that include risk assessment and risk management. The NAAQOs are set by the federal government based on recommendations from a National Advisory Committee and Working Group on Air Quality Objectives and Guidelines. Provincial governments have the option of adopting these either as objectives or as enforceable standards according to their legislation.
Air Quality	CEPA-National Advisory Committee Working Group on Air Quality Objectives and Guidelines		Health Canada	CEPA - National Advisory Committee (NAC) Working Group on Air Quality Objectives and Guidelines (WGAQOG) consists of representatives of federal, provincial and territorial departments of environment and health. The group was established to review scientific information and prepare recommendations for National Ambient Air Quality Objectives (NAAQOs). Science-based

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				guidance is also provided to support the development of Canada-Wide Standards (CWS). The authority of the working group stems from CEPA 1999 Part 1 Section 6 (1)(c) where it is formed to support the CEPA-National Advisory Committee (CEPA-NAC).
Air Quality	United States – Canada Air Quality Agreement	Signed in 1991 Expanded in 2000 and 2007		The United States-Canada Air Quality Agreement serves as the primary mechanism for binational cooperation to address transboundary air pollution issues.
Biological Resources	Fisheries Act	1985 Act current to March 20, 2012 Last amended on April 1, 2011	Environment Canada on behalf of the Minister of Fisheries and Oceans	Provisions to prevent pollution of waters inhabited by fish.

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Biological Resources	Species at Risk Act (SARA)	December 12, 2002 Act current to April 2, 2012 Last amended on October 2, 2011	Environment Canada	The purposes of the Act are to prevent Canadian indigenous species, subspecies, and distinct populations from becoming extirpated or extinct, to provide for the recovery of endangered or threatened species, and encourage the management of other species to prevent them from becoming at risk. SARA is a result of the implementation of the Canadian Biodiversity Strategy, which is in response to the United Nations Convention on Biological Diversity. The Act provides federal legislation to prevent wildlife species from becoming extinct and to provide for their recovery.
Biological Resources	Canada Wildlife Act	1973 Act current to April 2, 2012 Last amended on December 10, 2010	Environment Canada	The Canada Wildlife Act specifies the requirements for a geographic area in Canada to be designated a National Wildlife Area by the Canadian Wildlife Service division of Environment Canada. The purpose of wildlife areas is to preserve habitats that are critical to migratory birds and other wildlife species, particularly those that are at risk. Further, the Wildlife Area Regulations, a component of the Canada Wildlife Act, identifies activities which are prohibited on such areas because they may harm a protected species or its habitat.
Biological	Migratory Birds	Act current to April	Environment	This Act provides the regulatory requirements

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Resources	Convention Act, 1994	2, 2012 Last amended on December 10, 2010	Canada	regarding Migratory Bird Hunting, as well as those applicable to other activities related to migratory birds, including: ◢ sale, gift or purchase ◢ shipment ◢ aviculture ◢ taxidermy ◢ activities involving birds causing damage or danger (e.g., agriculture) ◢ activities involving overabundant species ◢ activities at airports ◢ activities for scientific research purposes ◢ collection, possession, sale or trade of eiderdown ◢ import of migratory bird species that are not indigenous to Canada The Migratory Bird Sanctuary Regulations grant sanctuary status to areas that represent habitat that is important to migratory birds. These sanctuaries help protect the birds from hunting and all other disturbances while they are in breeding and other staging areas.

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Biological Resources	Wild Animal and Plant Protection and Regulation of International and Interprovincial Trade Act (WAPPRIITA)	December 17, 1992 Came into force on May 14, 1996, Act current to April 2, 2012 Last amended on December 10, 2010	Minster of the Environment	The purpose of WAPPRIITA is to protect Canadian and foreign species of animals and plants that may be at risk of overexploitation due to illegal trade and also to safeguard Canadian ecosystems from the introduction of species considered to be harmful. It accomplishes these objectives by controlling the international trade and interprovincial transport of certain wild animals and plants, as well as their parts and derivatives. WAPPRIITA also makes it an offence to transport illegally obtained wildlife between provinces and territories or between Canada and other countries.
Cultural Resources	Movable Cultural Property Program (MCP)	1977	Canadian Cultural Property Export Review Board	Protects objects of cultural significance to Canada, pursuant to the Cultural Property Export and Import Act , by regulating their export; entering into international agreements that prevent the illicit trafficking of cultural property; and designating well-managed custodial institutions and public authorities to be eligible to apply for grants to acquire cultural property and to apply to the Canadian Cultural Property Export Review Board to have donations certified as cultural property for income tax purposes.
Cultural	Department of	1995	Minister of	This Act established the Department of

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Resources	Canadian Heritage Act		Canadian Heritage	Canadian Heritage over which the Minister of Canadian Heritage presides. Under this Act, the Minister's jurisdiction encompasses, but is not limited to, jurisdiction over: (*a*) the promotion of a greater understanding of human rights, fundamental freedoms and related values; (*b*) multiculturalism; (*c*) the arts, including cultural aspects of the status of the artist; (*d*) cultural heritage and industries, including performing arts, visual and audio-visual arts, publishing, sound recording, film, video and literature; (*e*) national parks, national historic sites, historic canals, national battlefields, national marine conservation areas, heritage railway stations and federal heritage buildings; (*f*) the encouragement, promotion and development of amateur sport; (*g*) the advancement of the equality of status and use of English and French and the enhancement and development of the English and French linguistic minority communities in Canada; (*h*) state ceremonial and Canadian symbols; (*i*) broadcasting, except in respect of spectrum management and the technical aspects of broadcasting;

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				(*j*) the formulation of cultural policy, including the formulation of cultural policy as it relates to foreign investment and copyright; (*k*) the conservation, exportation and importation of cultural property; and (*l*) national museums, archives and libraries.
Cultural Resources	Heritage Railway Stations Protection Act	1985	Minister responsible for the Parks Canada Agency	The purpose of this Act is to protect heritage railway stations. Unless authorized by the Governor in Council, no railway company shall (*a*) remove, destroy or alter or sell, assign, transfer or otherwise dispose of a heritage railway station owned by it or otherwise under its control; or (*b*) alter any of the heritage features of a heritage railway station.
Cultural Resources	Historic Sites and Monuments Act	1985	Minister responsible for the Parks Canada Agency	This Act established the Historic Sites and Monuments Board of Canada. Under this Act, the Minister may: (*a*) by means of plaques or other signs or in any other suitable manner mark or otherwise commemorate historic places; (*b*) make agreements with any persons for marking or commemorating historic places pursuant to this Act and for the care and preservation of any places so marked or commemorated;

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				(*c*) with the approval of the Governor in Council, establish historic museums; (*d*) with the approval of the Treasury Board, acquire on behalf of Her Majesty in right of Canada any historic places, or lands for historic museums, or any interest therein, by purchase, lease or otherwise; and (*e*) provide for the administration, preservation and maintenance of any historic places acquired or historic museums established pursuant to this Act.
Energy Demand			National Energy Board	The National Energy Board is an independent federal agency that regulates several aspects of Canada's energy industry. Their purpose is to promote safety and security, environmental protection and efficient energy infrastructure and markets in the Canadian public interest within the mandate set by Parliament in the regulation of pipelines, energy development and trade. The National Energy Board is also responsible for all physical activities related to oil and gas exploration and operations in the North.
Energy Demand and Geology, Soils, and Mineral Resources	National Model Construction Codes	2010	National Research Council of Canada	Under Canada's *Constitution Act*, building, fire safety and plumbing regulations are the responsibility of provincial and territorial governments. The National Research Council of Canada, through its Construction Portfolio,

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				publishes six National Model Construction Codes on behalf of the Canadian Commission on Building and Fire Codes, which must be adopted by a regulatory authority in order to come into effect. In some cases, the Codes are amended and/or supplemented to suit regional needs, and then published as provincial codes. The six codes are: **National Building Code of Canada (NBC):** Addresses the design and construction of new buildings and the substantial renovation of existing buildings. **National Fire Code of Canada (NFC):** Provides minimum fire safety requirements for buildings, structures and areas where hazardous materials are used, and addresses fire protection and fire prevention in the ongoing operation of buildings and facilities. **National Plumbing Code of Canada (NPC):** Covers the design and installation of plumbing systems in buildings and facilities. **The National Energy Code of Canada for Buildings (NECB):** Provides technical requirements for the construction of energy-efficient buildings. **National Energy Code of Canada for Houses (NECH):** Provides technical requirements for the construction of energy-efficient houses.

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				National Farm Building Code of Canada (NFBC): Provides relaxations of the requirements in the NBC and addresses the particular needs of farm buildings.
Geology, Soils, and Mineral Resources	Metal Mining Effluent Regulations (MMER) (under the Fisheries Act)	Regulations current to April 2, 2012 Last amended on March 2, 2012	Environment Canada	The Metal Mining Effluent Regulations require metal mines to undertake environmental effects monitoring (EEM) to ensure the adequate protection of all receiving aquatic environments by assessing effects on fish, fish habitat and the usability of fisheries resources. The MMER require at least weekly sampling of effluent and the submission of quarterly and annual reports of results within specified time limits.
Geology, Soils, and Mineral Resources	Environmental Code of Practice of Metal Mines, 2009	2009	Environment Canada	The Environmental Code of Practice for Metal Mines describes operational activities and associated environmental concerns of this industrial sector. The document applies to the complete life cycle of mining, from exploration to mine closure, and environmental management practices are recommended to mitigate the identified environmental concerns. The recommended practices in the Code include the development and implementation of environmental management tools, the management of wastewater and mining wastes, and the prevention and control of environmental releases to air, water and land.

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Greenhouse Gases and Climate Change	Passenger Automobiles and Light Truck Greenhouse Gas Emission Regulations	September 23, 2010	Environment Canada	The purpose of these Regulations is to reduce greenhouse gas emissions from passenger automobiles and light trucks by establishing emission standards and test procedures that are aligned with the federal requirements of the United States. As a result of the regulations, it is projected that the average GHG emission performance of new vehicles for the 2016 model year will be about 25% lower than the vehicles that were sold in Canada in 2008.
Greenhouse Gases and Climate Change	Proposed Heavy-Duty Vehicle and Engine Greenhouse Gas Emission Regulations	Proposed April 14, 2012	Environment Canada	The objective is to reduce GHG emissions by establishing mandatory GHG emission standards for new on-road heavy-duty vehicles and engines that are aligned with United States national standards. The proposed regulations would reduce emissions from the whole range of on-road heavy-duty vehicles and engines, including large pick-up trucks, short/long-haul tractors, cement and garbage trucks, buses, and more, for the 2014 model year and beyond. They would allow the Government of Canada to continue establishing emission standards and test procedures that are aligned with those of the United States. As a result of implementing the proposed

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				standards, it is anticipated that greenhouse gas emissions from 2018 heavy-duty vehicles will be reduced by up to 23 percent from those sold in 2010. By the year 2020, it is anticipated that greenhouse gas emissions from Canada's heavy-duty vehicles will be reduced by 3 million tons per year.
Greenhouse Gases and Climate Change	Renewable Fuels Regulations	August 23, 2010	Environment Canada	Requires fuel producers and importers to have an annual average renewable content of five per cent in gasoline starting on December 15, 2010. The Government of Canada also intends to regulate a two per cent requirement for renewable content in diesel fuel and heating oil by 2011, subject to successful demonstration of technical feasibility under the range of Canadian conditions. The two per cent requirement would be put in place by an amendment to the Renewable Fuels Regulations. These regulations will fulfill the commitment made by the Government of Canada in 2006, when it announced that it would regulate renewable fuel content.
Greenhouse Gases and Climate Change	Proposed Reduction of Carbon Dioxide Emissions from Coal-Fired	Proposed June 23, 2010 Final Regulations expected in 2012, to come into effect	Environment Canada	These proposed regulations will apply a stringent performance standard to new coal-fired electricity generation units and those coal-fired units that have reached the end of their economic life. The gradual phase-out of

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	Generation of Electricity Regulations	on July 1, 2015		traditional coal-fired electricity generation is expected to have a significant impact on reducing emissions. The proposed regulations, in addition to other measures taken by federal and provincial governments and utilities to reduce electricity emissions from coal and other sources, are projected to result in a decline in the absolute level of GHG emissions from electricity generation.
Hazardous Materials/Human Health	Pest Control Products Act	December 12, 2002 Act current to February 9, 2011		To control, among other things, the introduction of new substances and products of biotechnology into the Canadian market so that the risk to the environment and human health is reduced.
Hazardous Materials/Human Health	Feeds Act	Act current to April 2, 2012 Last amended on June 28, 2006		To control, among other things, the introduction of new substances and products of biotechnology into the Canadian market so that the risk to the environment and human health is reduced.
Hazardous Materials/Human Health	Seeds Act	Act current to April 2, 2012 Last amended on December 12, 2005		To control, among other things, the introduction of new substances and products of biotechnology into the Canadian market so that the risk to the environment and human health is reduced.
Hazardous Materials/Human Health	Health of Animals Act	Act current to April 2, 2012 Last amended on		To control, among other things, the introduction of new substances and products of biotechnology into the Canadian market so that

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		July 1, 2007		the risk to the environment and human health is reduced.
Hazardous Materials/Human Health	Canada Shipping Act	Act current to March 20, 2012 Last amended on July 1, 2007	Transport Canada	An Act respecting shipping and navigation and to amend the Shipping Conferences Exemption Act, 1987 and other Acts. This is the principal legislation governing safety in marine transportation and recreational boating, as well as protection of the marine environment. It applies to Canadian vessels operating in all waters and to all vessels operating in Canadian waters (from canoes and kayaks to cruise ships and tankers). The CSA 2001 promotes the sustainable growth of the marine shipping industry without compromising safety.
Hazardous Materials/Human Health	Transportation of Dangerous Goods Act	Act current to April 2, 2012 Last amended on June 16, 2009	Transport Canada	The Transportation of Dangerous Goods Act and Regulations set standards for the movement of harmful chemicals to protect both the public and people moving goods. Dangerous goods are those defined in the regulations. Examples are explosives, compressed gas (such as oxygen, propane, aerosols), flammable liquids (such as paint, gasoline, diesel fuel), oxidizing substances, toxic substances (formerly called poison), infectious substances, corrosive substances, and miscellaneous goods that pose enough of a risk

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				in transport to justify regulation.
Hydrology and Water Quality	Federal Water Policy	1987 Last amended in 2011		The Federal Water Policy addresses the management of water resources, balancing water uses with the requirements of the many interrelationships within the ecosystem. The policy takes into account the needs of all Canadians in its overall objective: to encourage the use of freshwater in an efficient and equitable manner consistent with the social, economic and environmental needs of present and future generations. To manage Canada's water resources, the federal government has defined two main goals: (1) to protect and enhance the quality of the water resource; and, (2) to promote the wise and efficient management and use of water.
Hydrology and Water Quality	Canada Water Act	Passed in 1970 Act current to March 20, 2012 Last amended on April 1, 2005	Environment Canada	An Act to provide for the management of the water resources of Canada, including research and the planning and implementation of programs relating to the conservation, development and utilization of water resources. Contains provisions for formal consultation and agreements with the provinces.
Hydrology and Water Quality	International River Improvements Act	Act current to March 20, 2012 Last amended on	Environment Canada	An Act respecting the construction, operation and maintenance of international river improvements. Provides for licensing of activities

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		December 10, 2010		that may alter the flow of rivers flowing into the United States.
Hydrology and Water Quality	Oceans Act	Passed December 18, 1996 Enacted in 1997 Act current to April 2, 2012 Last amended on October 5, 2005	Environment Canada	The Oceans Act provides a framework for modern ocean management. The Act calls for the Minister of Fisheries and Oceans to lead and facilitate the development of a national ocean management strategy. The Act specifies the need to integrate marine conservation with development activities to maintain healthy ecosystems.
Hydrology and Water Quality	International Boundary Waters Treaty Act	1985 Act current to March 20, 2012	Environment Canada	An Act respecting the International Joint Commission established under the treaty of January 11, 1909 relating to boundary waters.
Hydrology and Water Quality	Navigable Waters Protection Act	Act current to March 20, 2012 Last amended on March 12, 2009	Environment Canada	An Act respecting the protection of navigable waters
Land Use and Planning	Federal Policy on Land Use	1984	Federal government	The *Federal Policy on Land Use* is designed to guide the internal activities of the federal government and their effects on the use of private and public land through the nation. The goal of the policy is "To ensure that federal policies and programs and the management of federal lands contribute to the wise use of Canada's land resources." The first policy statement asserts: "The federal government will pursue the

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				achievement of the policy goal through a cooperative federal/provincial approach, and will support those provincial land-use objectives, policies and programs that it views to be operating in the national interest." One of ten guidelines of the *Federal Policy on Land Use* states: "Local, regional and provincial concerns, plans and zoning will be considered, and appropriate action will be taken to ensure that the federal influence on land and local environments has a positive impact."
Land Use and Planning	Territorial Lands Act	Act current to April 2, 2012 Last amended on April 1, 2003	Governor in Council	An Act respecting Crown lands in the Northwest Territories and Nunavut. Subject to Section 6, the Governor in Council may, where the Governor in Council deems it necessary for the protection of the ecological balance or physical characteristics of any area in the Northwest Territories or Nunavut, set apart and appropriate any territorial lands in that area as a land management zone.
Noise	Noise Regulations	Various	Federal government	The federal government sets standards for noise emission labelling and maximum sound emissions for consumer products (e.g., limits for noisy toys, under the *Hazardous Products Act*), as well as for equipment and vehicles. For example, the *Motor Vehicle Safety Act* &

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				regulations mandate maximum exterior sound levels for vehicles, as well as interior sound levels for certain large trucks and buses. The *Canada Labour Code* regulates occupational noise in federally regulated workplaces. Every employer must ensure that levels of sound and vibration are in accordance with prescribed standards. For example, the *Aviation Occupational Safety and Health Regulations* and the *Oil and Gas Occupational Safety and Health Regulations* under the Code set maximum sound levels to which workers can be exposed during a 24-hour period. Health Canada's Acoustics Division promotes reduction of the health effects of noise exposure and provides and implements standards to protect against occupational and environmental noise, among other things. As well, Health Canada is required to advise on the health effects of environmental noise to environmental assessments involving other federal departments. For example, in 1989, Health Canada commented on the health aspects of noise that would be associated with the construction of additional runways at Toronto's Pearson Airport. Health Canada spearheaded development of the (voluntary) Canadian Standards Association's

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				standard *Noise Emission Declarations for Machinery*. These declarations appear in instructions, technical sales literature and labels and also assist employers in decisions to purchase quieter machines, implement noise control plans and comply with occupational and environmental noise regulations.
Noise	Occupational Exposure Limits in Canada	July 4, 2011	Canadian Centre for Occupational Health and Safety	The Canadian Centre for Occupational Health and Safety (CCOHS) promotes the total well-being - physical, psychosocial and mental health - of working Canadians by providing information, training, education, management systems and solutions that support health, safety and wellness programs. A not-for-profit federal department corporation, CCOHS is governed by a tripartite Council - representing government, employers and labour - to ensure a balanced, approach to workplace health and safety issues. Occupational exposure limits (OELs) for noise are typically given as the maximum duration of exposure permitted for various noise levels. They are often displayed in exposure-duration tables. ◢ Québec Noise Exposure Limits: ◢ Maximum Permitted Exposure Level for 8 hours is 90 dB(A). ◢ Maximum Peak Pressure Level is 140 dB(peak)

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				◢ Maximum Number of Impacts is 100
Employment, Population, and Housing	Addressed within other laws and regulations.			
Public Services	Addressed within other laws and regulations.			
Recreation	Parks Canada Agency Act	1998	Minister of the Environment	This Act established the Parks Canada Agency (PCA) for the purpose of ensuring that Canada's national parks, national historic sites and related heritage areas are protected and presented for this and future generations and in order to further the achievement of the national interest as it relates to those parks, sites and heritage areas and related programs.
Recreation	Canada National Parks Act	1930	Minister of the Environment	This Act, first established in 1930 and amended in 1988, provides the legislation for National Parks in Canada. Previous to 1930 each National Park had been established by individual Acts. The management of such a park was then subject to the stipulations outlined in the establishing legislation. After 1930 the National Parks Act provided an organic set of rules for the operation of every National Park. New park establishment then became simply a designation of the park's boundaries. The purpose statement is as follows: "The National Parks of Canada are hereby dedicated to the people of Canada for their

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				benefit, education and enjoyment . . . and shall be maintained and made use of so as to leave them unimpaired for the enjoyment of future generations."
Recreation	Canada National Marine Conservation Areas Act	2002	Minister responsible for the Parks Canada Agency	This Act establishes marine conservation areas for the purpose of protecting and conserving representative marine areas for the benefit, education and enjoyment of the people of Canada and the world. Marine conservation areas shall be managed and used in a sustainable manner that meets the needs of present and future generations without compromising the structure and function of the ecosystems, including the submerged lands and water column, with which they are associated. The Governor in Council may make regulations, consistent with international law, for the control and management of any or all Marine Conservation Areas, including regulations for the protection of ecosystems and elements of ecosystems, and for the management and control of renewable resource harvesting activities.
Recreation	Fishing and Recreational Harbours Act	1985	Governor in Council	The use, management and maintenance of every scheduled harbour, the enforcement of regulations relating thereto and the collection of

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				charges for the use of every scheduled harbour are under the control and administration of the Minister. The Governor in Council may make regulations (*a*) prescribing schedules naming and delimiting or describing the fishing or recreational harbours or portions thereof belonging to Her Majesty in right of Canada that are under the control and administration of the Minister for the purposes of this Act; (*b*) for the maintenance of order and the safety of persons and property at any scheduled harbour; (*c*) not inconsistent with any other Act of Parliament or regulations made thereunder, for the control of mooring, berthing, loading and discharging of vessels at any scheduled harbour; (*d*) not inconsistent with any other Act of Parliament or regulations made thereunder, for the control of pollution at any scheduled harbour; (*e*) prescribing standards for the accommodation and services provided or to be provided at any scheduled harbour; (*f*) prescribing charges for the use of any scheduled harbour; (*g*) prescribing the duties or functions of persons appointed or designated under this Act or any other Act of Parliament to supervise or manage

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				any fishing or recreational harbour to which this Act applies; (*h*) governing inquiries into accidents and incidents held under section 26; (*i*) prescribing terms and conditions of agreements entered into pursuant to subsection 5(2) or (3); (*j*) prescribing the manner of undertaking economic or other studies pursuant to subsection 5(4); (*k*) prescribing terms and conditions of leases, licenses and agreements entered into or granted pursuant to section 8; (*l*) prescribing the form of the tickets that may be issued pursuant to paragraph 25(1)(*a*); (*m*) respecting the detention and safe-keeping of vessels and goods seized under this Act and the payment of any reasonable costs incidental thereto; (*n*) prescribing the manner of disposing of anything forfeited under this Act; and (*o*) generally for carrying out the purposes and provisions of this Act.

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Transportation and Traffic	Canada Transportation Act	1996	Transport Canada	An Act to continue the National Transportation Agency as the Canadian Transportation Agency, to consolidate and revise the National Transportation Act, 1987 and the Railway Act and to amend or repeal other Acts as a consequence.
Utilities and Service Systems		April 1976	Canada's Energy and Utility Regulators (CAMPUT)	CAMPUT is a self-supporting, non-profit organization of federal, provincial, and territorial boards and commissions which are responsible for the regulation of the electric, water, gas, and pipeline utilities in Canada. Some CAMPUT members are also responsible for the regulation of matters such as automobile insurance.
Utilities and Service Systems	Regulate pipelines, energy development and trade		National Energy Board (NEB)	NEB is an independent federal agency established in 1959 by the Parliament of Canada to regulate international and interprovincial aspects of the oil, gas and electric utility industries. The purpose of the NEB is to regulate pipelines, energy development and trade in the Canadian public interest. These principles guide NEB staff to carry out and interpret the organization's regulatory responsibilities. The NEB is accountable to Parliament through the Minister of Natural Resources Canada.

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Utilities and Service Systems	Nuclear Safety and Control Act	May 31, 2000 Act current to April 2, 2012 Last amended on July 12, 2010	Canadian Nuclear Safety Commission (CNSC)	The Nuclear Safety and Control Act (NSCA) of Canada replaced the Atomic Energy Control Act of 1946 with new, more effective and explicit legislation to regulate the activities of the Canadian nuclear industry. The NSCA also provided for the establishment of the Canadian Nuclear Safety Commission (CNSC), which replaced the Atomic Energy Control Board (AECB).
Utilities and Service Systems	Nuclear Liability Act	Act current to April 2, 2012		Allows the federal government to cap the liability of a nuclear plant operator at $75 million.
Antarctic Environment	Antarctic Environmental Protection Act (AEPA)	October 20, 2003	Environment Canada	The purpose of the AEPA is to protect the Antarctic environment by implementing the Protocol on Environmental Protection to the Antarctic Treaty. The AEPA provides the legislative basis that Canada requires to oversee Canadian activities in the Antarctic and otherwise fulfill the Madrid Protocol's obligations.
Antarctic Environment	Arctic Waters Pollution Prevention Act	Act current to March 20, 2012 Last amended on January 2, 2010		An Act to prevent pollution of areas of the arctic waters adjacent to the mainland and islands of the Canadian arctic.

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All	Environment Protection Act	1990	Ministry of the Environment	Ontario's Environmental Protection Act provides authority to the Ministry of the Environment to (a) investigate problems of pollution, waste management, waste disposal, litter management and litter disposal; (b) conduct research related to contaminants, pollution, waste management, waste disposal, litter management and litter disposal; (c) conduct studies of the quality of the natural environment, meteorological studies, and monitoring programs; (d) conduct studies of environmental planning designed to lead to the wise use of the natural environment; (e) convene conferences and conduct seminars and educational and training programs relating to contaminants, pollution, waste and litter; (f) gather, publish and disseminate information relating to contaminants, pollution, waste and litter; (g) make grants and loans in such amounts and upon such terms as the Ministry considers advisable for, (i) research and training in relation to contaminants, pollution, waste, litter and the reduction of waste and the reuse and

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				recycling of materials that are or could become waste, (ii) planning, operating, developing, improving and enlarging waste management systems, waste disposal sites and programs to encourage the reduction of waste or the reuse or recycling of materials that are or could become waste, and (iii) discontinuing waste management systems or reduction, reuse or recycling programs or closing waste disposal sites; (h) establish and operate demonstration and experimental sewage systems under Part VIII, waste management systems, waste disposal sites and programs concerning the reduction of waste or the reuse or recycling of materials that are or could become waste; (i) appoint committees to perform such advisory functions as the Ministry considers advisable; (j) with the approval of the Lieutenant Governor in Council, enter into an agreement with any government or person relating to the protection or conservation of the natural environment; (k) establish and operate, use, alter, enlarge and extend waste management systems or waste disposal sites; and (l) discontinue systems and close sites that meet

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				specified criteria.
All	Environmental Assessment Act	1990	Ministry of the Environment	Ontario's Environmental Assessment Act requires that Topics addressed within an environmental assessment may include: 1. Identification of alternatives. 2. Collection of data (criteria/indicators/data sources). 3. Evaluation of alternatives (potential effects, impact management, net effects, advantages/disadvantages). 4. Identification of preferred alternative (one or more could be selected). Specific provincial rules are provided for transit projects, waste management projects, electricity projects, and private sector development. Environmental assessments are subject to review by government experts, Aboriginal communities, the public, and any other interested party.
All	Planning Act	1990	The Minster, the council of a municipality, a local board, a planning board and the	The purposes of the Planning Act, are: (a) to promote sustainable economic development in a healthy natural environment within the policy and by the means provided under this Act;

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			Municipal Board.	(b) to provide for a land use planning system led by provincial policy; (c) to integrate matters of provincial interest in provincial and municipal planning decisions; (d) to provide for planning processes that are fair by making them open, accessible, timely and efficient; (e) to encourage co-operation and co-ordination among various interests; (f) to recognize the decision-making authority and accountability of municipal councils in planning. In carrying out their responsibilities under the Planning Act, responsible agencies have regard to: (a) the protection of ecological systems, including natural areas, features and functions; (b) the protection of the agricultural resources of the Province; (c) the conservation and management of natural resources and the mineral resource base; (d) the conservation of features of significant architectural, cultural, historical, archaeological or scientific interest; (e) the supply, efficient use and conservation of energy and water; (f) the adequate provision and efficient use of

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				communication, transportation, sewage and water services and waste management systems; (g) the minimization of waste; (h) the orderly development of safe and healthy communities; (h.1) the accessibility for persons with disabilities to all facilities, services and matters to which this Act applies; (i) the adequate provision and distribution of educational, health, social, cultural and recreational facilities; (j) the adequate provision of a full range of housing, including affordable housing; (k) the adequate provision of employment opportunities; (l) the protection of the financial and economic well-being of the Province and its municipalities; (m) the co-ordination of planning activities of public bodies; (n) the resolution of planning conflicts involving public and private interests; (o) the protection of public health and safety; (p) the appropriate location of growth and development; (q) the promotion of development that is designed to be sustainable, to support public

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				transit and to be oriented to pedestrians.
Aesthetic Resources	See regulations that pertain to all resources areas, above, and land use and planning regulations, below	--	--	--
Agricultural and Forest Resources	Farming and Food Production Act	1998	Ministry of Agriculture, Food, and Rural Affairs Board; local municipalities	The Farming and Food Production act was developed to conserve, protect, and encourage the development and improvement of agricultural land for the production of food, fiber, and other agricultural or horticultural products.
Agricultural and Forest Resources	Nutrient Management Act of 2002	2002	Provincial officers, and responsible Ministries	The purpose of this Act is to provide for the management of materials containing nutrients in ways that will enhance protection of the natural environment and provide a sustainable future for agricultural operations and rural development.
Agricultural and Forest Resources	Forestry Act	1990	Ministry of Natural Resources and Wildlife, local municipalities	The Forestry Act allows the Ministry of Natural Resources and Wildlife to enter agreements with land owners of forest lands for the reforestation of portions of land, the entry and planting of trees upon such portions by the employees or agents of the council, and the fencing of the portions and conservation of all growing trees within the subject land. In addition, the Forestry act allow

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				the Ministry of Natural Resources to establish programs to protect, manage, or establish woodlands and to encourage forestry that is consistent with good forestry practices.
Air Quality	See regulations that pertain to all resources areas, above.	--	--	--
Biological Resources	See regulations that pertain to all resources areas and agricultural and forestry resources, above, and land use and planning regulations, below	--	--	--
Biological Resources	Provincial Parks and Conservation Reserves Act	2006	Ministry of Natural Resources and other members of the Executive Council	The purpose of the Provincial Parks and Conservation Reserves Act is to permanently protect a system of provincial parks and conservation reserves that includes ecosystems that are representative of all of Ontario's natural regions, protects provincially significant elements of Ontario's natural and cultural heritage, maintains biodiversity and provides opportunities

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				for compatible, ecologically sustainable recreation.
Cultural Resources	Section 35 of the Constitution Act	1982	Ministry of Aboriginal Affairs and Aboriginal Affairs and Northern Development Canada.	Section 35 of the Constitution Act, 1982, requires that consultation with Aboriginal communities at the environmental assessment stage. Guidance related to consultation, include consideration of: • The nature, scope, and content of the duty to consult and accommodate varies with the circumstances. • Meaningful consultation requires the Crown (Ontario Government) to listen with an open mind to what the Aboriginal communities have to say. • There may be a requirement to makes changes to a proposal based on information obtained through consultations. • Accommodation requires a process of balancing interests. • Responsiveness is a key element of both consultation and accommodation.
Energy Demand	Ontario Energy Board Act	1998	Ontario Energy Board	The Ontario Energy Board Act is guided by the following objectives:

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				1. To protect the interests of consumers with respect to prices and the adequacy, reliability and quality of electricity service. 2. To promote the education of consumers. 3. To promote economic efficiency and cost effectiveness in the generation, transmission, distribution, sale and demand management of electricity and to facilitate the maintenance of a financially viable electricity industry. 4. To promote electricity conservation and demand management in a manner consistent with the policies of the Government of Ontario, including having regard to the consumer's economic circumstances. 5. To facilitate the implementation of a smart grid in Ontario. 6. To promote the use and generation of electricity from renewable energy sources in a manner consistent with the policies of the Government of Ontario, including the timely expansion or reinforcement of transmission systems and distribution systems to accommodate the connection of renewable energy generation facilities. The Ontario Energy Board Act provided regulations for gas (storage, transmission, facilities), electricity (license conditions, generation, transmission), and transmission and

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				distribution lines.
Geology, Soils, and Mineral Resources	Aggregate Resources Act	1990	Ministry of Natural Resources and Ministry of Northern Development, Mines and Forestry	The Aggregate Resources act provides for the management of the aggregate resources of Ontario, regulates aggregate operations, requires the rehabilitation of land from which aggregate has been excavated, and minimizes adverse impacts on the environment in respect of aggregate operations.
Geology, Soils, and Mineral Resources	Mining Act	1990	Ministry of Natural Resources and Ministry of Northern Development, Mines and Forestry	The Mining Act regulates mining claims, oil, gas, underground storage and salt solution mining, surface mining of non-metallic minerals, rehabilitation of mining lands, and tax requirements for mining operations.
Greenhouse Gases	Climate Change Mitigation and Low-carbon Economy Act	2016	Ministry of the Environment and Climate Change or relevant members of the Executive Council	The Climate Change Mitigation and Low-Carbon Economy Act is intended to reduce greenhouse gas emissions, transition Ontario to a low-carbon economy, and enable Ontario to collaborate and coordinate its actions with similar actions in other jurisdictions in order to ensure the efficacy of its regulatory scheme in the context of a broader international effort to respond to climate change. This act establishes greenhouse gas emission reduction targets to be reduced by 15 percent by 2020, 37 percent by 2030, and 80 percent by 2050, compared to 1990 levels. It requires

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				preparation of climate change action plan that sets out actions under a regulatory scheme designed to modify behavior that will enable Ontario to achieve its targets for the reduction of greenhouse gas emissions. The Climate Change Mitigation and Low-Carbon Economy Act also contains the Cap and Trade Program, addressing accounts and transactions, emission allowances and credits, verification, inspection, and investigation, and enforcement.
Greenhouse Gases	Green Energy Act	2009	Ministry of Energy or relevant members of the Executive Council	The Ontario Green Energy Act, formally the Green Energy and Green Economy Act, 2009, introduced in the Ontario legislature on February 23, 2009, is intended to expand renewable energy production, encourage energy conservation and create green jobs. This act creates a number of feed-in tariff (FIT) rates for different types of energy sources. Notable among these is the microFIT (renewable energy microgenereation) program for small non-commercial systems under 10 kilowatts, and FIT, the larger commercial version which covers a number of project types with sizes into the megawatts.
Hazards and Hazardous	Pesticides Act	1990	Ministry of the	The Pesticides Act allows the Ministry of the Environment to: investigate problems relating to

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Materials			Environment	pesticides and the control of pests; conduct research relating to pesticides and the control of pests; conduct studies of the effect of pesticides and the control of pests on the quality of the environment; convene conferences and conduct seminars and educational programs relating to pesticides and the control of pests; gather, publish and disseminate information relating to pesticides and the control of pests; make grants and loans for research related to pesticides and the control of pests in such amounts and upon such terms and conditions as the regulations may prescribe; appoint committees to perform such advisory functions as the Ministry considers requisite; and, with the approval of the Lieutenant Governor in Council, enter into an agreement with any government or person relating to pesticides or the control of pests.
Hazards and Hazardous Materials	The Technical Standards and Safety Act	2000	Relevant Ministry	The Technical Standards and Safety Act regulates, among other things, fuel storage tanks, both aboveground and underground. Its provisions require that where an aboveground or underground storage system is removed permanently, an assessment must be completed delineating the full extent of any petroleum product that has escaped to the environment

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Hazards and Hazardous Materials	Occupational Health and Safety Act	1990	Ministry of Labour	The Occupational Health and Safety Act contains provisions that deal with the handling of hazardous materials in the workplace, for example: asbestos. It also mandates the Workplace Hazardous Materials Information System (WHIMIS) and the requirements for material safety data sheets (MSDSs).
Hazards and Hazardous Materials	The Dangerous Goods Transportation Act	1990	Ministry of Transportation	The Dangerous Goods Transportation Act mirrors the federal act, and imports the provisions of the federal act into Ontario for purposes of the transportation of good by provincially-regulated transportation entities.
Hazards and Hazardous Materials	Fire Protection and Prevention Act	1997	Executive Council Members	The Fire Protection and Prevention Act require municipalities to establish a program in the municipality which must include public education with respect to fire safety and certain components of fire prevention; and provide such other fire protection services as it determines may be necessary in accordance with its needs and circumstances.
Hydrology and Water Quality	Drainage Act	1990	Local municipalities	The Drainage Act provides a procedure whereby the municipality may, with a valid petition of landowners in the "area requiring drainage", provide a legal outlet for surface and subsurface waters not attainable under common law. In

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				return, the landowners within the defined drainage watershed pay for the privilege of the drainage outlet. Future maintenance costs are covered as part of the drainage report. Under the Drainage Act, the municipality is responsible for maintaining the drainage works after construction. The municipality may appoint a drainage superintendent to supervise maintenance work on all municipal drains within the municipality. When the drainage report is "current", maintenance work can be undertaken without preparing a new drainage report. The drainage superintendent is responsible to the municipality and the landowners for inspecting the drain or local problems on the drain, discussing necessary maintenance with landowners, and supervising the maintenance work. The costs for maintenance are distributed amongst the landowners in the watershed according to the maintenance clauses contained in the current report.
Hydrology and Water Quality	The Ontario Water Resources Act	1990	Ontario Clean Water Agency	The purpose of the Ontario Water Resources Act is to provide for the conservation, protection, and management of Ontario's waters and for their efficient and sustainable use, in order to promote Ontario's long-term environmental, social, and economic well-being. The act contains provisions

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				that regulate the discharge of sewage and definitions of water basins (Great Lakes – St. Lawrence River Basin, Nelson Basin, and Hudson Bay Basin).
Land Use and Planning	See regulations that pertain to all resources areas, above.	--	--	--
Land Use and Planning	Provincial Policy Statement	2015	The Minster, the council of a municipality, a local board, a planning board and the Municipal Board.	The Provincial Policy Statement provides policy direction on matters of provincial interest related to land use planning and development. As a key part of Ontario's policy-led planning system, the Provincial Policy Statement sets the policy foundation for regulating the development and use of land. It also supports the provincial goal to enhance the quality of life for all Ontarians
Land Use and Planning	Development Charges Act	1997	The Minster, the council of a municipality, a local board, a planning board and the Municipal Board.	The Development Charges Act allows the council of a municipality to impose development charges against land to pay for increased capital costs required because of increased needs for services arising from development of an area.
Land Use and Planning	Smart Growth for Our Communities	2015	The Minster, the council of a municipality, a local	The Smart Growth for Our Communities Act, 2015 (Bill 73) received Royal Assent on December 3, 2015. The Act makes changes to

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	Act		board, a planning board and the Municipal Board.	both the Development Charges Act and Planning Act to: • Help municipalities fund growth • Give residents a greater, more meaningful say in how their communities grow • Protect and promote greenspaces • Make the development charges system more predictable, transparent and accountable • Make the planning and appeals process more predictable • Give municipalities more independence and make it easier to resolve disputes
Land Use and Planning	Greenbelt Plan	2015	Greenbelt Advisory Panel	The Growth Plan for the Greater Golden Horseshoe, the Greenbelt Plan, the Oak Ridges Moraine Conservation Plan and the Niagara Escarpment Plan are four provincial land use plans that work together to manage growth, build complete communities, curb sprawl and protect the natural environment. These plans support agriculture and promote economic development in Ontario's Greater Golden Horseshoe. As Canada's largest economic engine, the Greater Golden Horseshoe is also one of the fastest growing regions in North America. It contains some of Canada's best farmland, valuable water resources, and world-renowned natural features like the Niagara Escarpment.

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Noise	See regulations that pertain to all resources areas, above.	--	--	--
Employment, Population and Housing	Housing Services Act	2011	Ministry of Municipal Affairs and Housing or such other member of the Executive Council	The Housing Services Act requires that service managers prepare a plant to address housing and homelessness that includes: an assessment of current and future housing needs within the service manager's service area; objectives and targets relating to housing needs; a description of the measures proposed to meet the objectives and targets; a description of how progress towards meeting the objective and targets will be measured; and such other matters as may be prescribed
Public Services	Fire Protection and Prevention Act	1997	Executive Council Members	The Fire Protection and Prevention Act require municipalities to establish a program in the municipality which must include public education with respect to fire safety and certain components of fire prevention; and provide such other fire protection services as it determines may be necessary in accordance with its needs and circumstances.
Recreation	Provincial Parks and Conservation	2006	Ministry of Natural Resources and	The purpose of the Provincial Parks and Conservation Reserves Act is to permanently

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	Reserves Act		other members of the Executive Council	protect a system of provincial parks and conservation reserves that includes ecosystems that are representative of all of Ontario's natural regions, protects provincially significant elements of Ontario's natural and cultural heritage, maintains biodiversity and provides opportunities for compatible, ecologically sustainable recreation.
Transportation and Traffic	Highway Traffic Act	1990	Ministry of Transport	The Highway Traffic Act established the Registrar of Motor Vehicles, which has general supervision over all matters relating to highway traffic within Ontario. This includes permits, license, parking, equipment requirements (e.g., mirrors, tires, noise, smoke, horns), speed limits, and rules of the road.
Utilities and Service Systems	The Clean Water Act The Nutrient Management Act The Safe Drinking Water Act	2006 2002 2002	Ministry of Natural Resources and other members of the Executive Council	These three Acts arise out of an incident in which a municipal drinking water system was contaminated through a combination of agricultural run-off and poor training and management by municipal officials. The Acts, read together, are an attempt to prevent a recurrence of that kind of incident, through a combination of measures. The Clean Water Act, 2006, is intended to protect sources of drinking water. It requires designated areas, principally municipalities, to

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				prepare source protection plans, which are measures to identify and protect local drinking water sources. The Nutrient Management Act, 2002, regulates the use of materials, chiefly associated with large scale or intensive agricultural and livestock operations, which may adversely affect the environment. The Safe Drinking Water Act, 2002, regulates drinking water systems. It establishes standards for those who own and operate a drinking water system, in most cases, municipal governments. It imposes requirements on those who operate the systems and on those who test the systems.
Utilities and Service Systems	Ontario Water Resources Act	1990	Ontario Water Resources Agency	The Ontario Water Resources Act contains requirements for water rights, construction of wells, and approval of sewage works.
Utilities and Service Systems	See Energy Demand Above	--	--	--
Utilities and Services Systems	Resource Recovery and Circular Economy Act	2016	Ministry of the Environment and Climate Change	The Resource Recovery and Circular Economy Act directs the Ministry of the Environment and Climate Change to develop the Strategy for a Waste-Free Ontario. The purpose of the strategy

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				is to: (a) protect the natural environment and human health; (b) foster the continued growth and development of the circular economy; (c) minimize greenhouse gas emissions resulting from resource recovery activities and waste reduction activities; (d) minimize the generation of waste, including waste from products and packaging; (e) increase the durability, reusability and recyclability of products and packaging; (f) hold persons who are most responsible for the design of products and packaging responsible for the products and packaging at the end of life; (g) decrease hazardous and toxic substances in products and packaging; (h) minimize the need for waste disposal; (i) minimize the environmental impacts that result from resource recovery activities and waste reduction activities, including from waste disposal; (j) provide efficient, effective, convenient and reliable services related to resource recovery and waste reduction, including waste management services;

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				(k) increase the reuse and recycling of waste across all sectors of the economy; (l) increase opportunities and markets for recovered resources; (m) promote public education and awareness with respect to resource recovery and waste reduction; (n) promote cooperation and coordination among various persons and entities involved in resource recovery activities and waste reduction activities; (o) promote competition in the provision of resource recovery services and waste reduction services; (p) foster fairness for consumers; (q) do any other related thing that may be prescribed.

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ATTACHMENT B: SUMMARY OF IMPACT

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Draft Environmental Analysis
Summary of Impacts
Proposed Cap-and-Trade Regulatory Amendments and California's Compliance Plan for the Federal Clean Power Plan

	Extension of the Cap Post-2020; Extension of Allowance Allocation Beyond 2020, Incorporation of Leakage Studies results for Post-2020 Period; Compliance with CPP	**Linkage with Ontario, Canada**
Aesthetics	CE: LTS	CE: LTS
	OP: LTS	OP: PSU
Agriculture and Forest Resources	CE: LTS	CE: LTS
	OP: LTS	OP: PSU
Air Quality	CE: PSU	CE: PSU
	OP: PSU	OP: PSU
Biological Resources	CE: PSU	CE: PSU
	OP: PSU	OP: PSU
Cultural Resources	CE: PSU	CE: PSU
	OP: PSU	OP: PSU
Energy Demand	CE: B	CE: B
	OP: B	OP: B
Geology, Soils, and Mineral Resources	CE: PSU	CE: PSU
	OP: LTS	OP: PSU
Greenhouse Gas	CE: B	CE: B
	OP: B	OP: B
Hazards and Hazardous Materials	CE: LTS	CE: LTS
	OP: LTS	OP: PSU
Hydrology and Water Quality	CE: PSU	CE: PSU
	OP: LTS	OP: PSU
Land Use and Planning	CE: LTS	CE: LTS
	OP: PSU	OP: PSU
Noise	CE: LTS	CE: LTS
	OP: PSU	OP: LTS
Population, Employment, and Housing	CE: LTS	CE: LTS
	OP: LTS	OP: LTS
Public Services	CE: LTS	CE: LTS
	OP: LTS	OP: LTS
Recreation	CE: LTS	CE: LTS
	OP: LTS	OP: PSU
Transportation and Traffic	CE: LTS	CE: LTS
	OP: PSU	OP: LTS
Utilities and Service Systems	CE: LTS	CE: LTS
	OP: LTS	OP: LTS

CE: covered entities
OP: offset protocols
LTS: less-than-significant
PSU: potentially significant and unavoidable
B: beneficial