California Environmental Protection Agency
Air Resources Board

Proposed Regulation to Implement the California Cap-and-Trade Program

APPENDIX C

STAFF REPORT AND COMPLIANCE OFFSET PROTOCOL

U.S. FOREST PROJECTS

Release Date: October 28, 2014

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State of California
California Environmental Protection Agency
AIR RESOURCES BOARD
Stationary Sources Division

STAFF REPORT: INITIAL STATEMENT OF REASONS
PROPOSED REGULATION TO IMPLEMENT
THE CALIFORNIA CAP-AND-TRADE PROGRAM

APPENDIX C

STAFF REPORT AND COMPLIANCE OFFSET PROTOCOL

U.S. FOREST PROJECTS

Public Hearing to Consider the Proposed Regulation
to Implement the California Cap-and-Trade Program

Date of Release: October 28, 2014
Scheduled for Consideration: December 18 and 19, 2014

Location:

California Air Resources Board
Byron Sher Auditorium
1001 I Street
Sacramento, California 95814

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I. INTRODUCTION AND BACKGROUND ON COMPLIANCE OFFSET PROTOCOLS

A. Staff Proposal

Staff is recommending the Board adopt an updated Compliance Offset Protocol for U.S. Forest Projects (Forest Protocol) to fulfill the Board's direction to the Executive Officer in Resolution 11-32 "to monitor protocol development and to propose technical updates to adopted protocols, as needed." This appendix discusses the proposed updates to the Forest Protocol. All proposed changes discussed in this appendix are in addition to proposed and Board approved changes made to the Forest Protocol at the September 2014 Board hearing. These previous changes are described in the staff report released on July 29, 2014. Per the Board's direction, changes to common practice values in the Assessment Area Data File and the adjustment to the classification of high and low site class productivity were moved from the September update to this update. This delay provides additional review time of these elements for stakeholders unfamiliar with the rulemaking process.

B. Rationale for Compliance Offset Protocols

Under the Cap-and-Trade Program (Program), covered entities may use compliance offset credits to satisfy up to eight percent of their compliance obligation. This limit applies to each individual covered or opt-in covered entity for each compliance period. Compliance offsets are tradable credits that represent verified greenhouse gas (GHG) emissions reductions or removal enhancements from sources not subject to a compliance obligation in the Cap-and-Trade Program and resulting from one of the following: (1) a project undertaken using an Air Resources Board (ARB or Board) approved Compliance Offset Protocol pursuant to Subarticle 13 of the Cap-and-Trade Regulation; (2) an offset credit issued by a linked jurisdiction pursuant to Subarticle 12 of the Cap-and-Trade Regulation; or (3) a sector-based offset credit issued by an approved sector-based crediting program pursuant to Subarticle 14 of the Cap-and-Trade Regulation. These GHG sources are usually outside of the industrial, energy, and transportation sectors.

As required by Division 25.5 of the Health and Safety Code (Assembly Bill 32 or AB 32), any reduction of GHG emissions used for compliance purposes must be real, permanent, quantifiable, verifiable, enforceable, and additional (Health and Safety Code §38562(d)(1) and (2)). Any offsets issued by ARB must be quantified according to Board-approved Compliance Offset Protocols. The Cap-and-Trade Regulation (Regulation) includes provisions for collecting and submitting the appropriate monitoring

documentation to support the verification and enforcement of reductions realized through the generation and retirement of Compliance offset credits. The regulatory provisions and the requirements of the Compliance Offset Protocols will ensure that the reductions are quantified accurately, represent real GHG emission reductions, and are not double-counted within the system. Compliance Offset Protocols are considered regulatory documents and are made publicly available so that anyone interested in developing an offset project can do so if their project meets Board-approved standards.

C. Board Adoption of Compliance Offset Protocols

At its October 20, 2011 meeting, the Board adopted four Compliance Offset Protocols, including protocols for Livestock (digester) Projects, Ozone Depleting Substances (ODS) Destruction Projects, Urban Forest Projects, and U.S. Forest Projects. Resolution 11-32, adopted by the Board on October 20, 2011, directed the Executive Officer "to develop implementation documents laying out the process for review and consideration of new offset protocols, including a description of how staff will evaluate additionality." This direction signaled the Board's intention to adopt additional Compliance Offset Protocols in the future. The Compliance Offset Protocol Review Process document is available at: http://www.arb.ca.gov/cc/capandtrade/compliance-offset-protocol-process.pdf. In April 2014, the Board adopted a fifth Compliance Offset Protocol, the Mine Methane Capture Projects protocol. Updates to three existing Compliance Offset Protocols: Livestock Projects, Ozone Depleting Substances Projects and U.S. Forest Projects are proceeding through the adoption process.

D. Compliance Offset Protocol Structure and Regulatory Requirements

Compliance Offset Protocols consist of two main structural elements: project requirements and project quantification. Project requirements include items such as eligibility, monitoring and reporting, and verification and enforcement provisions. AB 32 requires ARB to adopt regulatory requirements for verification and enforcement of any offset reductions used for compliance purposes. Project quantification identifies the quantification methodologies and equations used in project accounting such as baseline determination and calculation of emissions and emission reductions.

The Regulation includes offset program regulatory requirements, including but not limited to: eligibility criteria for start dates, project locations, offset project reporting periods, project document retention, project listing information, project reporting information, verification requirements, and enforcement provisions. Staff has developed the proposed updated Compliance Offset Protocol for U.S. Forest Projects to be consistent with regulatory requirements in the Regulation. Since Compliance Offset Protocols are used in the context of a compliance program, staff has included language in the proposed updated Compliance Offset Protocol for U.S. Forest Projects to refer to

the regulatory requirements in the Regulation where needed rather than splitting the offset protocols into separate documents based on regulatory requirements and quantification methodologies. In sections that relate directly to a requirement in the Regulation, text refers readers to the appropriate section(s) of the Regulation.

The updated Compliance Offset Protocol for U.S. Forest Projects will be incorporated by reference into proposed amendments to the Regulation. This incorporation makes the offset protocol document an enforceable regulation. AB 32 exempts quantification methodologies from the Administrative Procedure Act (Government Code, section 11340, *et seq.*) (APA); however those elements of the Compliance Offset Protocol are still regulatory. The exemption allows future updates to the quantification methodologies to be made through a public review and Board adoption process but without the need for rulemaking documents. Each Compliance Offset Protocol identifies sections that are considered quantification methodologies and exempt from APA requirements. Any changes to the non-quantification elements of the Compliance Offset Protocols would be considered a regulatory update subject to the full regulatory development process pursuant to the APA.

II. UPDATED COMPLIANCE OFFSET PROTOCOL FOR U.S. FOREST PROJECTS

A. Role of Forests in Climate Change Mitigation

Forests play an essential role in climate change mitigation through their capacity to remove carbon dioxide from the atmosphere through photosynthesis, and sequester carbon for long periods of time in various biomass carbon pools. 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 litter on the forest floor. Wood products that are harvested from forests can also provide long term storage of carbon. Through sustainable management, reforestation, and protection, forests can help address global climate change. The Forest Protocol is designed to address the forest sector's unique capacity to sequester, store, and emit CO_2. Specifically, there is a significant climate change mitigation opportunity for forests through the reforestation of non-forest or previously deforested lands, forest management activities to increase carbon stocks, and the avoided conversion of at-risk forest lands.

B. Update to the Compliance Offset Protocol for U.S. Forest Projects

The process of updating the U.S. Forest Protocol (Forest Protocol) involved an extensive review of relevant documents and literature as well as a stakeholder process, which included soliciting input from industry experts, government agencies, project developers, academia and the public through workshops and small group discussions. ARB staff also incorporated lessons learned from implementing the current Compliance Offset Protocol and reviewing early action projects.

The stakeholder process to update the U.S. Forest Protocol began on March 17, 2014, when ARB staff held a public workshop to discuss the decision to update several Compliance Offset Protocols, including the U.S. Forest Protocol. During this public stakeholder workshop, ARB invited interested members of the public to submit comments on the proposed updates and participate in the formal rulemaking process. Staff also had many individual interactions with stakeholders interested in discussing protocol related issues, and this staff proposal reflects those discussions.

As part of its update of this protocol, ARB staff reviewed its existing U.S. Forest Protocol, publicly available documents from the U.S. Forest Service and documents submitted by technical experts and other stakeholders. These documents are included in the reference section of this Staff Report, and are cited when relied upon for facts.

The proposed update to the U.S. Forest Protocol incorporates the best available science and information to ensure that emission reductions are real, permanent, quantifiable, additional, verifiable, and enforceable.

A draft version of the proposed updated U.S. Forest Protocol was made publicly available in June 2014.

ARB staff solicited and incorporated input from stakeholders into the proposed version released along with this Staff Report for public review on October 28, 2014. The formal 45-day public comment period begins on October 31, 2014 and the updated Compliance Offset Protocol along with the proposed amendments to the Regulation will be considered at the December 18 and 19, 2014 Board hearing.

The following list provides specific changes proposed to the U.S. Forest Protocol in this rulemaking:

- Expanded eligible project locations to include parts of Alaska;
- Updated common practice values in the Assessment Area Data File using the latest data from the U.S. Department of Agriculture Forest Service Forest Inventory and Analysis National Program;
- Adjusted the classification of high and low site class productivity to align with the site class stratification used in the adjusted common practice values;
- Reformatting the protocol to more closely follow standard regulatory format;
- Removed explanatory text;
- Shifted some text between chapters and/or appendices;
- Added some language consistent with current Cap-and-Trade Regulation and standardized to other Compliance Offset Protocols;
- Identified additional sections as quantification methodologies;
- Added, modified, or removed definitions and acronyms;
- Clarified that native species and the composition of native species must be assessed at initial and all subsequent verifications;
- Modified applicability of sustainable harvesting practices and natural forest management requirements;
- Clarified that a project can utilize a combination of methods to demonstrate sustainable long-term harvesting practices on all of the forest landholdings subject to the requirement;
- Clarified uneven-aged management requirements for option 3 of the sustainable harvesting practices;
- Modified eligibility for projects that practice even-aged management;

- Clarified the eligibility of forestlands that were previously included in a voluntary carbon offset project other than one of the approved early action offset quantification methodologies;
- Modified compensation rate for terminated improved forest management projects to cover all time periods;
- Clarified the list of actions that can trigger offset project commencement;
- Clarified that no crediting of increased soil carbon is allowed;
- Clarified that shrubs and herbaceous understory carbon pool is only included in the baseline for reforestation projects;
- Clarified how to consider conservation easements in the baseline;
- Clarified that baseline carbon stock estimates are approved at the time of the project's initial verification and that if correctable errors are detected in subsequent verifications that the baseline must be adjusted;
- Modified the secondary effects calculation for reforestation projects;
- Clarified the activity shifting leakage risk assessment for reforestation projects;
- Modified the minimum baseline level calculation for improved forest management projects where initial carbon stocks are above common practice;
- Modified requirements for improved forest management projects to demonstrate that the baseline is financially feasible;
- Modified the conversion-type classifications for avoided conversion projects;
- Clarified the appraisal requirements for avoided conversion projects;
- Clarified that the avoided conversion discount factor is approved at the time of the project's initial verification;
- Clarified the process for quantifying carbon in harvested wood products;
- Modified listing and reporting requirements;
- Clarified reporting items that avoided conversion projects may defer;
- Clarified the requirements for reporting carbon stocks;
- Clarified that annual estimates of carbon stocks must reflect the appropriate confidence deduction;
- Extended the deadline for submission of the offset verification statement for the initial reporting period;
- Clarified that complete carbon inventory methodology must be verified during the initial full verification;
- Clarified that the modeling plan assumptions and silvicultural prescriptions applied to produce the project baseline must be verified during the initial full verification;
- Clarified that listing information is subject to verification at the initial and all subsequent offset project verifications;

- Modified the site visit requirements when a new confidence deduction or reversal risk rating is established;
- Added requirement for full verifications;
- Clarified that the verifier must review documentation and data supporting the information reported in the Offset Project Data Report during all full verifications;
- Clarified sequential sampling requirements;
- Modified minimum number of sample plots in sequence for projects with more than three strata;
- Clarified that verifiers cannot use regression estimators nor estimate heights in place of plot-based field measurements of heights; and clarified verification team requirements;
- Modified forest carbon inventory requirements;
- Removed legacy models from list of approved models;
- Clarified that the formulas, equations, and data embedded within a model must be transparent;
- Modified the requirements for using the lower wildfire risk rating;
- Added common practice values, volume and biomass equations, and data for calculating carbon in harvested wood products for regions of Alaska; and
- Added references.

Common practice values in the Assessment Area Data File were updated by incorporating the latest data from the U.S. Department of Agriculture Forest Service Forest Inventory and Analysis National Program.[1] FIA plot data was categorized into the previously established Supersections and Assessment Areas with a few exceptions where existing Assessment Areas warranted refinement to correct for errors. The data was then reviewed by site class groupings. The application of high and low site class was standardized for all Assessment Areas resulting in high site class being defined as Forest Service FIA assigned class productivity codes I-IV and low site class being defined as Forest Service FIA assigned class productivity codes V-VII. Based on the species composition or number of data point available, some Assessment Areas were not disaggregated by high and low site class; in these cases the common practice value for the Assessment Area is based on data for Forest Service FIA assigned class productivity codes I-VII. The classification of high and low site classes was adjusted in Appendix F of the Forest Protocol to align with the site class stratification used to derive the updated common practice values.

[1] Publicly available at: http://apps.fs.fed.us/fiadb-downloads/datamart.html

C. Description of the Compliance Offset Protocol for U.S. Forest Projects

1. Overview

ARB's Forest Protocol allows offset project developers in the United States to quantify greenhouse gas emission reductions and removal enhancements associated with forest management activities. A forest offset project is a planned set of activities designed to increase removals 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.

Proposed revisions to the Forest Protocol are based on ARB's Compliance Offset Protocol for U.S. Forest Projects approved for adoption by the Board on September 18, 2014. Currently the Forest Protocol is applicable to projects in the United States, excluding Alaska and Hawaii, among the proposed revisions is expanding eligible project locations to parts of Alaska.

ARB's Forest Protocol covers three types of forest projects:

- Reforestation Projects, which involve planting trees on land that has been out of forest cover for at least 10 years or has been subject to a significant disturbance.
- Improved Forest Management Projects, which involve undertaking management activities to maintain or increase carbon stocks on forested lands relative to baseline levels of carbon stocks.
- Avoided Conversion Projects, which involve preventing the conversion of forestland to a non-forest land use by dedicating the land to continuous forest cover through a qualified conservation easement or transfer to public ownership.

Projects on both private and public lands are eligible.

ARB's Forest Protocol defines a Forest Owner, for purposes of the Forest Protocol, as the owner of any interest in the real (as opposed to personal) property involved in a forest project. Generally, a Forest Owner is the legal land owner (owner in fee) of the property involved in a forest project. In some cases, one entity may own the land while another entity may have an interest in the trees or the timber on the property, in which case all entities or individuals with interest in the real property are collectively considered the Forest Owners. However, a single Offset Project Operator must be identified. The Offset Project Operator is responsible for undertaking a forest project and ensuring the requirements of the protocol are adhered to, and that all local, regional, and federal requirements are met. All Forest Owner(s) are ultimately responsible for all forest project commitments. The Offset Project Operator is responsible for project listing, monitoring, reporting, record retention, and verification activities. The Offset Project Operator must have the legal authority to implement the

offset project. Forest projects are not eligible to receive offset credits for GHG reductions that occur as the result of forest management activities that are not in compliance with all regulatory requirements.

ARB's Forest Protocol requires forest projects to employ natural forest management, demonstrate sustainable harvesting practices, and maintain or increase standing live carbon stocks over the life of the project. The Forest Protocol also includes provisions that promote native species, and prohibit broadcast fertilization. Implementing a forest project does not prevent Forest Owners from managing their lands for timber resources, but rather allows Forest Owners to receive credit for actions taken to maintain and increase carbon sequestration and avoid emissions on their lands.

2. Additionality

ARB's Forest Protocol requires that any offset credits be generated by projects that yield surplus GHG emission reductions or removal enhancements that exceed any GHG reductions or removals otherwise required by law or regulation, or any GHG reduction or removal that would otherwise occur in a conservative business-as-usual scenario. Projects must satisfy both a legal requirement test and a performance test for additionality. The protocol contains specific guidance on setting a baseline to ensure only additional reductions are credited. For example, all modeled project baselines must incorporate all legal constraints. Reforestation Projects must demonstrate that the land has been out of forest cover for 10 years or where a recent significant disturbance has occurred, demonstrate that reforestation would not be expected to be financially viable without the project or occurs in an area not historically subject to timber harvesting. Improved Forest Management Projects must take various factors into consideration when setting the project baseline, such as carbon stocking levels relative to comparable lands (common practice), historic management practices (high stocking reference), management of other entity forest lands within a logical management unit, financial feasibility of the baseline model, as well as the current stocking levels and legal constraints on the management of project lands. Avoided Conversion Projects must demonstrate both that the conversion of project lands is legally permissible and, through a real estate appraisal, that the project area is suitable to conversion to an identified alternative use and that the alternative use has a significantly higher market value than maintaining the area as forest land.

3. Permanence

To ensure permanence, all forest projects commit to maintain all credited emission reductions or removal enhancements for 100 years following the issuance of any offset credit for GHG reductions or removals achieved by the project. For example, if offset

credits are issued to a forest project in year 24 following its start date, monitoring and verification activities must be maintained until year 124.

Because GHG reductions and removals from forest projects can be “reversed” if the stored carbon associated with them is released (back) into the atmosphere, mechanisms to ensure permanence are included in the protocol. Biological and non-biological agents, both natural and human-induced, can cause reversals. Some of these agents cannot completely be controlled and may therefore result in an unintentional reversal, such as natural agents like fire, insects, and wind. Other agents can be controlled, such as human activities like land conversion and over-harvesting. Under this offset protocol, reversals due to controllable agents are considered intentional. Back burn fires, a type of controlled burn intentionally set to protect forestlands from an advancing wildfire by reducing the amount of flammable material that can burn when the wildfire reaches the burnt area and serving as a divide between the oncoming fire and the rest of the forestland, are controllable but do not constitute an intentional reversal. Back burn fires must be set by, or at the request of, a local, state or federal fire protection agency to qualify. If the quantified GHG reductions and removals in a given year are negative and offset credits were issued to the forest project in any previous year, it is considered a reversal, regardless of the cause of the decrease.

Permanence of forest project GHG reductions and removals is addressed through three mechanisms:

- The requirement for all projects to monitor onsite carbon stocks, submit annual Offset Project Data Reports, and undergo third-party verification of those reports with site visits at least every six years for the duration of the project life (which continues 100 years after the date of the last offset credit issuance).
- The regulatory obligation for all intentional reversals of GHG reductions and removals to be compensated for through retirement of other valid Compliance Instruments.
- The maintenance of a Forest Buffer Account by ARB to provide insurance against reversals of GHG reductions and removals due to unintentional causes (including natural disturbances such as fires, pest infestations, or disease outbreaks).

Unintentional reversals are addressed by requiring the project developer to contribute a percentage of ARB issued offset credits to the Forest Buffer Account. All forest projects must contribute a percentage of issued offset credits to the Forest Buffer Account any time offset credits are issued by ARB. The amount of the contribution is based on a project-specific risk evaluation. If a forest project experiences an unintentional reversal, offset credits from the Forest Buffer Account will be retired in an amount equal to the

total amount of carbon that was reversed. If a reversal is found to be intentional, then the Offset Project Operator or Authorized Project Designee must compensate for the reversal by surrendering valid compliance instruments from its account equal in quantity to the reversal in CO_2-equivalent metric tons.

A forest project will be terminated by ARB if a significant disturbance occurs leading to an unintentional reversal that reduces the project's standing live tree carbon stocks below the project's baseline standing live tree carbon stocks. Once a forest project terminates in this manner, the Forest Buffer Account covers the unintentional reversal and the project has no further obligations under this offset protocol.

A forest project is terminated by ARB if an entity does not elect to observe project responsibilities and commitments. A forest project may be voluntarily terminated prior to the end of its crediting period if the required quantities of compliance instruments are retired. All early terminations will require a quantity of compliance instruments to be retired:

- For a Reforestation or Avoided Conversion Project, a quantity of compliance instruments equal to the total number of offset credits issued to the project over all preceding reporting periods must be retired.
- For an Improved Forest Management Project, a quantity of compliance instruments equal to the amount of offset credits issued to the project over all preceding reporting periods multiplied by the appropriate compensation rate as set forth in the protocol must be retired.

4. Leakage

The Regulation requires offset protocols to conservatively account for activity-shifting and market-shifting leakage risks associated with an offset project. Activity-shifting leakage is defined as increased GHG emissions or decreased GHG removals that result from the displacement of activities or resources from inside the offset project's boundary to locations outside the offset project's boundary as a result of the offset project activity. Market-shifting leakage is defined as increased GHG emissions or decreased GHG removals outside an offset project's boundary due to the effects of an offset project on an established market for goods or services.

The Forest Protocol includes standard approaches and factors for accounting for potential leakage. To account for the potential increase in harvesting on other forest lands as a result of reduced harvesting on project lands, the protocol applies a standard factor to annual harvested wood product figures. There are also methods for quantifying the emissions risk of displacing other land uses in Reforestation and Avoided Conversion projects.

5. Quantification Methodology

Annual project greenhouse gas emissions or removals are compared to the project baseline to determine the net emission reductions or removal enhancements eligible for offset crediting. Quantification in the Forest Protocol is based on the accounting of carbon stored or emitted from various carbon pools included in the project boundary (in CO_2-equivalent units). All forest projects must account for carbon in standing live tree biomass (above and below ground), standing dead wood (above and below ground) and harvested wood products. In addition, Reforestation Projects must account for carbon in shrubs and herbaceous understory. Projects that involve intensive site preparation activities where soil disturbance exceeds 25 percent of the project area or mechanical site preparation activities are not conducted on contours must account for soil carbon. Each project must develop and maintain a forest carbon inventory methodology consistent with the Forest Protocol. Forest carbon stocks for required carbon pools are quantified primarily through field inventories. Based on the sampling error of the inventory, a statistical confidence deduction may be applied to the carbon stocks to address measurement uncertainty. Sample plot data used to develop or update the inventory must never be older than 12 years and projects are required to update their forest carbon inventories using approved models. These models allow projects to extrapolate sample plot data and account for harvesting, growth, and mortality in years when sample plots are not directly measured. Modeled plot data would need to be modified if contradicted by a verification site-visit or future plot measurements, or if an adjustment is required when the project operator transitions the project to an updated version of the protocol.

6. Monitoring, Reporting, and Verification

Annual project data, including annual GHG reductions or removal enhancements (or reversals), are submitted to ARB for each reporting period in the Offset Project Data Report. Offset Project Data Reports must be verified by an accredited third-party verification body at least once every six years with a site visit. Site visits are also required if a project reports a change to the confidence deduction or there is a change to the forest project's reversal risk rating as a result of undertaking fuel treatments to reduce the risk of wildfire. Each project verification will evaluate the emission reductions, removal enhancements, or reversals since the last verification was conducted. While verification may take place less often than annually, each reporting period must be independently verified. In cases were multiple reporting periods are verified at once, an offset verification statement must be issued for each reporting period. ARB only issues offset credits for verified GHG emission reductions or removal enhancements. For example, a project that has six years of data verified at one time would only be issued offset credits for those years following successful verification of

the data. For transparency, project information will be made publically available. The initial verification of a project must be completed within thirteen months from the end of the first reporting period.

Data collection, analysis, and storage procedures must be documented in the forest carbon inventory methodology. The inventory must be updated each year to account for growth, harvest, mortality, and any disturbances or reversals, if applicable. Updating the inventory must account for growth, harvest, mortality, disturbance, incorporating new inventory plot data, retiring older sample plots, changes in modeling, and application of confidence deductions.

III. ENVIRONMENTAL ANALYSIS

A. Introduction

This chapter of the Staff Report provides an environmental analysis (EA) that evaluates the potential environmental impacts of the proposed updated Compliance Offset Protocol for U.S. Forest Projects (Forest Protocol). In 2010, ARB prepared a functional equivalent document (FED) for the Cap-and-Trade Regulation (2010 FED) that addressed the potential environmental impacts of the Forest Protocol and other Compliance Offset Protocols. In 2010, the Forest Protocol applied to the lower 48 states. The proposed updated Forest Protocol includes changes or clarifications that do not alter the reasonably foreseeable compliance responses of qualifying forest projects and changes to expand project eligibility to areas of Alaska. This EA, included in this staff report, supplements the original environmental evaluation contained in the 2010 FED.

Based on ARB's review, staff has determined that implementation of the proposed updated Forest Protocol would not result in any new types of potentially significant adverse impacts on the physical environment that were not already addressed in the 2010 FED; however, the environmental effects identified previously for the Forest Protocol in 2010 would be extended geographically by the proposed updated protocol by expanding project eligibility for areas of Alaska. Because some previously identified environmental effects were significant, this supplemental analysis updates the environmental evaluation to consider the broadened geographic area of eligibility for the proposed updated Forest Protocol. This chapter of the Staff Report also discusses environmental benefits expected from implementing the proposed updated Forest Protocol.

B. Project Description

1. Compliance Offset Program

The Compliance Offset Program allows some GHG emission reductions and removal enhancements from qualified offset projects to become eligible for use in the Cap-and-Trade Regulation. An offset is a credit that represents a reduction or removal of greenhouse gases by an activity that can be measured, quantified and verified. Individual offset projects can be implemented to generate offset credits, which can then be sold and used by a covered entity as a compliance instrument in the Cap-and-Trade Regulation. Under the Cap-and-Trade Regulation, covered entities may use a limited number of offset credits to satisfy a portion of their compliance obligation. Specifically, covered entities may use offset credits for up to 8 percent of their total compliance obligation for each compliance period. Offsets are tradable credits that represent

verified GHG emission reductions in sectors and sources not covered under the cap. Although the offset project is not itself covered under the cap, it can generate reductions for use by entities who must comply with the Regulation. The inclusion of offsets in the program will support the development of innovative projects and technologies from sources not subject to a compliance obligation. Recognizing existing offset projects also supports the requirements of Assembly Bill (AB) 32, the Global Warming Solutions Act of 2006, to ensure that voluntary reductions receive appropriate credit and helps create an initial supply of offset credits for the Cap-and-Trade Regulation.

As required by AB 32, any reduction of GHG emissions used for compliance purposes must be real, permanent, quantifiable, verifiable, enforceable, and additional (Health and Safety Code [HSC], Section 38562(d)(1) and (2)). Offsets issued by ARB must be quantified according to Board-adopted methodologies. The Cap-and-Trade Regulation includes requirements for collecting and submitting the appropriate monitoring documentation to support the verification and enforcement of reductions incentivized through the generation and retirement of ARB offset credits (ARBOCs). The regulatory criteria for compliance offsets will ensure that the reductions are quantified accurately and are not double-counted within the system.

ARB's primary roles in the offset program are to develop and adopt Compliance Offset Protocols and/or updates to the Protocols, and perform all required CEQA analyses associated with the adoption of new or updated Compliance Offset Protocols; oversee and review Offset Project Registry activities, ARB-accredited offset verification bodies and offset verifiers, and Offset Project Operators; and issue ARB offset credits. ARB oversight of the conduct of Offset Project Registries and ARB-accredited verifiers is critical to the program's overall integrity. ARB does not delegate any of its legal authority to review or enforce the offset program to any entity, including approved Offset Project Registries. Apart from program review and oversight, ARB also serves administrative roles, reviews documents, implements appeals processes, and ultimately issues ARB offset credits.

2. Project Objectives

The proposed updated Forest Protocol is intended to help implement the project objectives of the Cap-and-Trade Regulation, as described in the *2010 Functional Equivalent Document prepared for the California Cap on GHG Emissions and Market-Based Compliance Mechanisms* (2010 FED). Primary objectives of Compliance Offset Protocols in the Cap-and-Trade Regulation that are applicable to the proposed updated Forest Protocol include the following:

a) Ensure Program Cost Effectiveness. AB 32 states that the Board shall adopt rules and regulations to achieve the maximum technologically feasible and

cost-effective GHG emission reductions in furtherance of meeting the State's GHG reduction goals. Offsets serve to broaden the compliance instrument market to provide greater flexibility to California businesses by offering a wider range of emissions reduction opportunities and greater market liquidity.

b) Encourage Technological Innovation and Reductions from Non-Capped Sectors. Offsets encourage reductions (beyond a conservative Business-As-Usual Scenario and what is required by law or regulation) from non-capped sources. Offsets support the development of innovative projects and technologies from sources outside capped sectors that can play a key role in reducing emissions both inside and outside California.

c) Decrease GHG Emissions. Offsets decrease GHG emissions in order to achieve the AB 32 mandate.

d) Maximize Environmental Benefits. Offsets maximize the environmental benefits for California.

3. Proposed Updated Forest Protocol

a. Description of Existing Forest Protocol

ARB's original Forest Protocol (referred to as "Forest Protocol" or "existing Forest Protocol" in this chapter, whereas the current action being evaluated is called "proposed updated Forest Protocol"), adopted by the Board in 2011, allows forest offset project developers throughout the U.S. to quantify GHG emission reductions and removal enhancements associated with forest management activities. A forest offset project (forest project) is a planned set of qualifying activities designed to increase removals of carbon dioxide (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 Forest Protocol covers three types of forest projects:

- Reforestation Projects, which involve planting trees on land that has been out of forest cover for at least 10 years or has been subject to a significant disturbance;
- Improved Forest Management Projects, which involve undertaking management activities to maintain or increase carbon stocks on forested lands; and
- Avoided Conversion Projects, which involve preventing the conversion of forest land to a non-forest use by dedicating the land to continuous forest cover through a conservation easement or transfer to public ownership.

Under the existing Forest Protocol, forest projects on both private and public lands are eligible anywhere throughout the U.S., except Alaska and Hawaii. Alaska and Hawaii

were originally explicitly excluded because biomass equations and resource parameters for input to equations did not exist at that time for forest conditions in those states, which prevented reliable and verifiable quantification of GHG reductions. Offset projects on federal lands that are not included in the categories of land listed below are not eligible at this time. Projects situated on the following categories of land are only eligible under this protocol if they meet the limited waiver of sovereign immunity in the Regulation:

1. Land that is owned by, or subject to an ownership or possessory interest of a Tribe;
2. Land that is "Indian lands" of a Tribe, as defined by 25 U.S.C. §81(a)(1); or
3. Land that is owned by any person, entity, or Tribe, within the external borders of such Indian lands.

For purposes of the Forest Protocol, a forest owner is defined as the owner of any interest in the real (as opposed to personal) property involved in a forest project. Generally, a forest owner is the legal land owner (owner in fee) of the property involved in a forest project. In some cases, one entity may own the land while another entity may have an interest in the trees or the timber on the property, in which case all entities or individuals with interest in the real property are collectively considered the forest owners, however, a single Offset Project Operator must be identified. The Offset Project Operator is responsible for undertaking a forest project and ensuring the requirements of the protocol are adhered to, and that all local, regional, and federal requirements are met; however, all forest owner(s) are ultimately responsible for all forest project commitments. The Offset Project Operator is responsible for project listing, monitoring, reporting, record retention, and verification activities. Projects are not eligible to receive offset credits for GHG reductions that occur as the result of forest management activities that are not in compliance with all regulatory requirements.

ARB's Forest Protocol requires forest projects to employ natural forest management, demonstrate sustainable harvesting practices, and maintain or increase standing live carbon stocks over the life of the project. The Forest Protocol also includes provisions that promote native species and prohibit broadcast fertilization. Implementing a forest project does not prevent forest owners from managing their lands for timber resources, but rather allows forest owners to receive credit for actions taken to maintain and increase carbon sequestration and avoid emissions on their lands.

b. Proposed Revisions to the Forest Protocol

As previously described, the proposed updated Forest Protocol includes two types of changes: (i) changes or clarifications that do not alter the reasonably foreseeable

compliance responses of qualifying forest projects, and (ii) amendment of the protocol to include qualifying forest projects in the state of Alaska.

The first type of proposed changes or clarifications includes the following:

- Reformatting the protocol to more closely follow standard regulatory format;
- Correcting typographical errors and mistakes that occurred when transitioning the protocol originally;
- Providing clarifications based on publicly released guidance from the first years of implementing the Compliance Offset Protocol;
- Clarifying eligibility requirements;
- Modifying equations used to quantify greenhouse gas reductions and removal enhancements and ensuring variables are well defined;
- Modifying forest carbon inventory requirements;
- Modifying additional listing and reporting requirements;
- Modifying verification requirements;
- Updating the common practice values in the Assessment Area Data File and adjusting the classification of high and low site class productivity; and
- Replacing volume and biomass equations for projects in California, Oregon, and Washington.

In addition, since 2011, forest resource parameters and mathematical equations to allow for quantification of GHG reductions in Alaska forests have been developed. Consequently, the proposed updated Forest Protocol would allow qualifying forest projects to be implemented in Alaska, in addition to the lower 48 states in the U.S. Because resource parameters are not yet available for Hawaii, that state would remain excluded from protocol eligibility at this time. If resource parameters for Hawaii are developed in the future, ARB would propose and process a separate amendment to the Forest Protocol, including additional CEQA compliance and public review.

c. Compliance Responses

The proposed updated Forest Protocol would not result in any changes to the qualifying forest project activities or associated compliance responses. The only substantive change with respect to compliance responses is the geographic expansion for eligible locations of proposed forest projects to include Alaska, in addition to the contiguous 48 states. Project-specific activities would vary depending upon the project type and site conditions. All forest projects would involve measurement and monitoring of carbon stocks.

As stated in the 2010 FED, the following reasonably foreseeable compliance responses could occur as a result of the implementation of forest projects. These responses could

occur in Alaska forests with the adoption and implementation of the proposed updated Forest Protocol.

Reforestation

- New trees would be planted within appropriate, degraded existing or former forest areas to increase tree canopy coverage and carbon sequestration.
- Areas will be cleared of debris or other forest products to allow natural reforestation processes to occur.
- Installation activities would include the delivery of tree seeds or seedling trees to the project area, 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.
- For both installation and maintenance, application of herbicides in a manner consistent with their label requirements would be expected to control competing species.
- 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.). Broadcast fertilization would not occur. Some harvesting of dead, diseased, or dying trees would occur; however, these trees would be replaced, so that there is a net gain in GHG emission reductions and removal enhancements.
- Monitoring activities would include the periodic survey of the project area by small 2-4 person crews. Mandatory monitoring and verification would occur every six years, with optional verification occurring on a more frequent basis.

Improved Forest Management

- Management activities would include the periodic rotation (harvest and re-planting) of trees to increase the age of the forest and its carbon sequestration potential. Tree harvesting could produce marketable timber. Productivity of carbon sequestration would increase through the periodic thinning of diseased and distressed trees. Competing brush and short-lived forest species would be removed where necessary to increase carbon stocks and trees would be planted in understocked areas, but in a manner that is still consistent with fire fuel management objectives for the project area.
- Forest management activities would be subject to local, state, and federal requirements and permits as appropriate to each project area.
- Installation activities would include the delivery of trees to the project area, 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.). Broadcast fertilization would not occur. Some harvesting of dead, diseased, or dying trees would occur and would be hauled off the project site.
- Monitoring activities would include the periodic survey of the project area by small 2-4 person crews. Mandatory verification would occur every six years, with optional verification occurring on a more frequent basis.

Avoided Conversion

- Legal agreements would be entered into to permanently conserve existing forest areas (qualified conservation easement or transfer to public ownership).
- Projects do not prevent any harvesting, but rather allow forest lands to continue to be managed as forests rather than converted to an alternative land use. Management of the forest lands may reflect a wide variety of different management objectives, provided that the projects adhere to all protocol requirements for natural forest management and sustainable harvesting.
- Monitoring activities would include the periodic survey of the project area by small 2-4 person crews. Mandatory monitoring and verification would occur every six years, with optional verification occurring on a more frequent basis.

d. Scope of Analysis and Assumptions

Staff has determined that, with the exception of expanding the geographic area of eligibility to Alaska, adoption of the proposed changes or clarifications in the proposed updated Forest Protocol has no potential to cause any new significant environmental impacts or a substantial increase in the severity of impacts previously disclosed in the 2010 FED, because they do not alter the reasonably foreseeable compliance responses of qualified forest projects. Further, there are no changes in circumstances or new information that would otherwise warrant any subsequent environmental review of these proposed changes or clarifications; the 2010 FED adequately addresses the potential environmental impacts associated with implementation of these changes or clarifications in the proposed updated Forest Protocol.

Therefore, this EA focuses on the potential environmental effects of expanding the geographic area of eligibility for the Forest Protocol to Alaska. Based on ARB's review, staff has determined that implementation of the proposed updated Forest Protocol would not result in any new types of potentially significant adverse impacts on the physical environment that were not already addressed in the 2010 FED, because the

forest management activities in qualifying forest projects would not change. The environmental effects identified previously in the 2010 FED regarding the original Forest Protocol would be extended geographically by the proposed updated protocol to qualified projects in the forests of Alaska. Because some previously identified environmental effects were significant, this supplemental analysis updates the environmental evaluation to consider the broadened geographic area of eligibility for the proposed updated Forest Protocol.

i. Legal Standards for Determining When Additional Environmental Analysis is Required

Under its certified regulatory program, ARB prepares the required CEQA documentation as part of the Staff Report for the proposed action (17 CCR 60000-60008). When the equivalent of an EIR or negative declaration has been prepared for a rule, regulation, order, standard or plan, ARB looks to PRC Section 21166 and 14 CCR 15162 for guidance on the triggers for further environmental review when considering approval of changes to that project. When an EIR for a project has been certified, that EIR is conclusively presumed valid unless a lawsuit challenging the EIR is timely filed (PRC Section 21167.2). This presumption precludes reopening the prior CEQA process unless one of the events triggering additional review as specified in PRC Section 21166 and 14 CCR 15162 has occurred.

14 CCR 15162 states:

> (a) When an EIR has been certified or negative declaration adopted for a project, no subsequent EIR shall be prepared for that project unless the lead agency determines, on the basis of substantial evidence in the light of the whole record, one or more of the following:
>
> > (1) Substantial changes are proposed in the project which will require major revisions of the previous EIR or negative declaration due to the involvement of new significant environmental effects or a substantial increase in the severity of previously identified significant effects;
> >
> > (2) Substantial changes occur with respect to the circumstances under which the project is undertaken which will require major revisions of the previous EIR or negative declaration due to the involvement of new significant environmental effects or a substantial increase in the severity of previously identified significant effects; or
> >
> > (3) New information of substantial importance, which was not known and could not have been known with the exercise of reasonable diligence at

the time the previous EIR was certified as complete or the negative declaration was adopted, shows any of the following:

(A) The project will have one or more significant effects not discussed in the previous EIR or negative declaration;

(B) Significant effects previously examined will be substantially more severe than shown in the previous EIR;

(C) Mitigation measures or alternatives previously found not to be feasible would in fact be feasible and would substantially reduce one or more significant effects of the project, but the project proponents decline to adopt the mitigation measure or alternative; or

(D) Mitigation measures or alternatives which are considerably different from those analyzed in the previous EIR would substantially reduce one or more significant effects on the environment, but the project proponents decline to adopt the mitigation measure or alternative.

If a subsequent or supplemental EIR or negative declaration is not required, the lead agency may document its decision and supporting evidence in an addendum (14 CCR 15164(a), (e)). The addendum and lead agency's findings should include a brief explanation of the decision not to prepare a subsequent or supplemental EIR or negative declaration (14 CCR 15164(e)). An addendum does not need to be circulated for public review, but it must be considered by the lead agency prior to making a decision on the project (14 CCR 15164(c)-(d)).

ii. Determination of Environmental Analysis Required for the Proposed Updated Forest Protocol

Using CEQA Guidelines section 15162 as guidance, a brief explanation is provided below to document the assessment underlying the determination of the appropriate environmental review prepared for the proposed updated Forest Protocol. The assessment recognizes that the proposed update contains two types of amendments: (1) proposed changes or clarifications to the Forest Protocol that do not alter the reasonably foreseeable compliance responses of qualifying forest projects and (2) expansion of the geographic area of eligibility for the proposed updated Forest Protocol to the state of Alaska.

a) There are no substantial changes to the Forest Protocol that require major revisions to the 2010 FED due to the involvement of new significant environmental impacts or a substantial increase in the severity of previously identified impacts. Regarding the extension of eligibility to Alaska, no new significant environmental impacts or a substantial increase in the severity of previously identified impacts addressed in the 2010 FED would occur; however, because the effects extended to Alaska forests include previously identified significant impacts, a supplemental EA is appropriate.

   None of the proposed changes or clarifications affects how projects are implemented under the two protocols, and would not result in new significant impacts or a substantial increase in the severity of previously identified impacts.

   The proposed updated Forest Protocol would allow forest projects to be implemented in Alaska, in addition to the 48 contiguous states. There would be no new significant environmental impacts or a substantial increase in the severity of previously identified impacts. Nonetheless, expanding the area affected by the reasonably foreseeable compliance responses to forests in Alaska would extend previously identified impacts, including significant impacts, to a new geography. Consistent with ARB's conservative approach to environmental review (i.e., seeking to avoid a risk of understating potential effects), preparing a supplemental EA is appropriate for a good faith disclosure of potential impacts in Alaska.

b) There are no substantial changes with respect to the circumstances under which the proposed updated Forest Protocol is being undertaken that require major revisions to the 2010 FED related to the proposed changes due to the involvement of new significant environmental impacts or a substantial increase in the severity of previously identified impacts. Regarding the extension of eligibility to Alaska, no new significant environmental impacts or a substantial increase in the severity of previously identified impacts addressed in the 2010 FED would occur; however, because the effects extended to Alaska forests include previously identified significant impacts, a supplemental EA is appropriate and is consistent with ARB's conservative approach to environmental review (i.e., seeking to avoid a risk of understating potential effects).

c) There is no new information of substantial importance, which was not known and could not have been known with the exercise of reasonable diligence at the time the 2010 FED was certified as complete, that changes the

conclusions of the 2010 FED with regard to impacts, mitigation measures, or alternatives;

During the first years of implementing the Forest Protocol, no new information of substantial importance has come to staff's attention through due diligence of all project reviews that led to the identification of additional or more severe environmental impacts, or feasible mitigation measures or alternatives that would reduce potentially significant impacts.

iii. Conclusion

The 2010 FED addressed the Forest Protocol and concluded there would be significant and unavoidable impacts to biological resources and land use and planning. This supplemental EA addresses two proposed updates to the Forest Protocol that was described in the 2010 FED: (1) changes or clarifications that do not alter the reasonably foreseeable compliance responses for qualifying forest projects, and (2) the allowance for forest projects to be implemented in Alaska. For the reasons described above, the first category of proposed updates need not be considered for any further environmental review because they would not change how projects are implemented.

For the proposed allowance of forest projects in Alaska, staff has determined that implementation of the proposed updated Forest Protocol would not result in any new types of potentially significant adverse impacts on the physical environment that were not already addressed in the 2010 FED; however, the environmental effects identified previously for the original Forest Protocol would be extended geographically to qualified projects in the forests of Alaska. Because some previously identified environmental effects were significant, a supplemental EA is appropriate to consider the broadened geographic area of eligibility for the proposed updated Forest Protocol. The supplemental environmental review is provided below in Section C, Impacts and Mitigation Measures.

C. Impacts and Mitigation Measures

As described in the 2010 FED, which is incorporated into this EA by reference, the Compliance Offset Protocols include several elements to support existing health and environmental protection. Specifically, each individual offset protocol requires all offset projects to be developed in compliance with all federal, state, and local laws, regulations, ordinances, and any other legal mandate, including all CEQA and National Environmental Policy Act (NEPA) requirements where applicable. The Offset Project Operator for a proposed offset project is required to attest to ARB that their project meets these requirements. If it is found that the offset project does not meet any of these requirements, the project is ineligible to be issued ARB offset credits for carbon

sequestration that occurred during the time that the project was out of compliance. In addition to the regulatory compliance requirements, Offset Project Operators must provide detailed information regarding the project at the time of listing which will be posted on the internet and available for public review.

This analysis is necessarily programmatic in nature because site-specific or project-specific aspects of environmental impacts cannot be precisely described at this time. For instance, the specific location, type, and number of offset projects that would occur under this updated protocol cannot be known and are dependent upon a variety of factors that are not within the control of ARB, including economic costs, offset demand, permitting requirements, environmental constraints, and other market constraints. Therefore, this supplemental EA addresses broadly defined types of impacts without the ability to determine the specific GHG reduction action or offset project locations, project size and character, or site-specific environmental characteristics. In light of these uncertainties, staff took a conservative approach (i.e., seeking to avoid a risk of understating potential effects) in its evaluation in order to satisfy the good-faith, full-disclosure intent of CEQA.

1. Environmental Setting

This section provides relevant additions to information presented in the 2010 FED discussion of the existing environmental and regulatory setting. The additions are focused on existing conditions and regulations associated with the state of Alaska that help inform the updated environmental impact analysis. For more general environmental setting information, please refer to the 2010 FED.

a. Aesthetics

i. Existing Conditions

The U.S. (including Alaska) exhibits tremendous scenic diversity by virtue of its size, setting, and variation. 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.

Forested areas exist throughout the U.S. The hardwood forest is spread over 730 million acres and extends across 2,000 miles from the Northeast to the South. Forty percent of the timber consists of deciduous hardwoods and the remaining sixty percent are coniferous evergreens (About.com. 2010). Alaska has 129 million acres of forested land, stretching from the coastal rain forest of Southeast and South-Central Alaska to the boreal forest of the Interior (Resource Development Council for Alaska 2014).

ii. Regulatory Setting

Federal Regulations

National 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], Part 800.5.)

National Scenic Byways Program. Congress established the National Scenic Byways Program in 1991 to designate roads with distinctive natural, scenic, historic, cultural, archaeological, or recreational qualities unique to their regions. The vision of the Federal Highway Administration's National Scenic Byways Program is "to create a distinctive collection of American roads, their stories and treasured places" (DOT 2011). The National Scenic Byways Program does not provide management guidance, but rather its mission is, "to provide resources to the byway community in creating a unique travel experience and enhanced local quality of life through efforts to preserve, protect, interpret, and promote the intrinsic qualities of designated byways" (DOT 2011).

State Regulations

Alaska Scenic Byways Program. Alaska established a Scenic Byways program in 1993 to recognize and celebrate some of the most beautiful landscapes in the state. Administered by the Alaska Department of Transportation and Public Facilities, this program also recognizes routes that provide access to the state's most scenic areas, cultural riches and recreational resources. Alaska's Scenic Byways start at the local level with a grass-roots byway organization. Once the byway organization applies for and receives scenic byway designation by the state, the route becomes eligible for grant funding to enhance and promote the byway's special qualities. They also become eligible to apply for national designations by the U.S. Secretary of Transportation (Alaska Department of Transportation & Public Facilities 2014).

Local Regulations

City and Borough Controls. Most local planning guidelines to preserve and enhance the visual quality and aesthetic resources of urban and natural areas are established in city and borough planning, platting and land use regulation. 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.

b. Agricultural and Forest Resources

i. Existing Conditions

Agriculture

Of Alaska's more than 366 million acres of land, an estimated 830,000 acres are farmed. The Anchorage area is the State's most productive agricultural region (USDA 2014). There are no prime farmlands, unique farmlands or farmlands of statewide importance designated in Alaska. The Fairbanks Soil and Water Conservation District and the Mantanuska-Susitna Borough have adopted criteria for Farmlands of Local Importance for lands within their jurisdictional boundaries (NRCS 2014).

Forest Resources

Alaska's forests are mostly in public ownership. They are owned and managed by the federal government (51 percent), state and local government, including the University of Alaska system (25 percent), Native corporations (24 percent), and private landowners (0.4 percent). Most commercial timber harvesting has taken place in the coastal zone, primarily on federal and Native corporation land in Southeast and coastal South-Central Alaska (Resource Development Council for Alaska 2014).

ii. Regulatory Setting

Federal Regulations

Farmland Protection Policy Act (FPPA). The FPPA is administered by the Natural Resources Conservation Service (NRCS). The NRCS maps soils and farmland uses to provide comprehensive information necessary for understanding, managing, conserving and sustaining the nation's limited soil resources. The NRCS determines impacts to farmland that could occur due to a proposed project. The determination is made through coordination between the federal agency proposing or supporting the project and NRCS. NRCS will make a determination, using set thresholds, as to whether additional project-specific mitigation would be required. The FPPA is intended to minimize the impact Federal programs have on the unnecessary and irreversible conversion of farmland to nonagricultural uses. It assures that—to the extent possible—Federal programs are

administered to be compatible with state, local units of government, and private programs and policies to protect farmland.

Federal agencies are required to develop and review their policies and procedures to implement the FPPA every two years. For the purpose of FPPA, farmland includes prime farmland, unique farmland, and land of statewide or local importance. Farmland subject to FPPA requirements does not have to be currently used for cropland. It can be forest land, pastureland, cropland, or other land, but not water or urban built-up land.

State Regulations

Alaska Forest Resources Act. The Alaska Forest Resources and Practices Act (FRPA, AS 41.17) governs how timber harvesting, reforestation, and timber access occur on state, private, and municipal land. Forest management standards on federal land must also meet or exceed the standards for state land established by the Act. The FRPA was originally adopted in 1978. Major revisions were adopted in 1990 to address riparian management on private land, enhance notification procedures for timber operations, reorganize the Board of Forestry, and establish enforcement procedures. Additional changes to the stream classification system and riparian management standards for coastal forests (Region I) were adopted in 1999. In 2003, changes were made to address interior Alaskan (Region III) riparian forest management standards. The Act is designed to protect fish habitat and water quality, and ensure prompt reforestation of forestland while providing for a healthy timber industry. The FRPA ensures that both the timber and commercial fishing industries can continue to provide long-term jobs (ADNR 2014).

Local Regulations

City and Borough. Cities and boroughs within Alaska often adopt their own criteria for agricultural and forest resources for lands within their jurisdiction. The criteria and regulatory provisions vary by jurisdiction.

c. Air Quality

i. Existing Conditions

A majority of Alaska is remote, largely undeveloped, and the air quality is generally pristine. Regional and local air quality is periodically affected by local, regional, and global natural events and anthropogenic activities. Natural pollution sources include wind-blown dust, ash from volcanic eruptions, and smoke from wild fires. The main contributors to human-made air pollution in Alaska are incomplete burning of fossil fuels from motor vehicles and heating, as well as smoke from wood stoves. Community

power plants also contribute to air pollution (BLM 2012). The two main U.S. Environmental Protection Agency (EPA) criteria pollutants impacting Alaska are Carbon Monoxide (CO) and Particulate Matter (PM). In addition to federal air quality programs, the State of Alaska operates the Title V and minor source permitting programs (ADEC 2014).

Anchorage

Anchorage, Alaska was first declared a non-attainment area for CO on January 27, 1978. Anchorage has not violated the National Ambient Air Quality Standard (NAAQS) for CO since 1996. The U.S. EPA, in 2002, approved Anchorage's attainment plan and Anchorage officially became a Carbon Monoxide Maintenance Area (ADEC 2014).

Juneau

U.S. EPA designated the Mendenhall Valley area of Juneau as a moderate non-attainment area for the NAAQS for particulate matter with an aerodynamic diameter less than or equal to a nominal 10 micrometers (PM_{10}), upon enactment of the federal Clean Air Act Amendments of 1990 (56 FR 56694, November 6, 1991). The non-attainment classification was based on violations of the 24-hour standard that occurred throughout the 1980s. The U.S. EPA fully approved Alaska's moderate PM_{10} non-attainment area plan as a State Implementation Plan (SIP) revision for the Mendenhall Valley PM_{10} non-attainment area in 1994 (Federal Register: March 24, 1994). There has been no measured violation of U.S. EPA's PM_{10} standard since 1994 (ADEC 2009). In 2013, the Mendenhall Valley area of Juneau officially became a PM_{10} Maintenance Area (78 FR Page 27071; U.S. EPA 2013a). The Limited Maintenance Plan (LMP) provides contingency plans should Juneau ever experience a PM_{10} problem in the future and allows for Juneau to be designated as attainment for PM_{10}. Juneau is also very close to exceeding the $PM_{2.5}$ health based standard of 24-hour 35 micrograms per cubic meter. However, Juneau is not on the national list of "non-attainment areas" for $PM_{2.5}$ (ADEC 2009).

Eagle River

Eagle River, Alaska was designated a non-attainment for PM_{10} in 1987 due to dust generation from the vehicular use of many unpaved roads in the area. Nearly all the gravel roads were paved in the early 1990s, which resulted in Eagle River being reclassified as moderate upon enactment of the Clean Air Act Amendments of 1990. On October 15, 1991 Alaska submitted a PM_{10} attainment plan and on August 13, 1993, it was approved by the U.S. EPA (ADEC 2014). Currently, Eagle River is classified as a PM_{10} Maintenance Area (78 FR Page 900; U.S. EPA 2013a).

Fairbanks

U.S. EPA designated the urban portion of the Fairbanks North Star Borough (FNSB) a non-attainment area for CO in 1991. The FNSB has not violated the NAAQS for carbon monoxide since 1999. EPA approved the FNSB's CO attainment plan and the FNSB officially became a Carbon Monoxide Maintenance Area on September 27, 2004 (ADEC 2014).

A portion of the Fairbanks North Star Borough, including the City of Fairbanks and the City of North Pole, was designated as a $PM_{2.5}$ non-attainment area in December 2009. These areas exceeded the health based 24 hour exposure limit of 35 micrograms/cubic meter for fine particulate matter (ADEC 2014). FNSB is currently designated a non-attainment for $PM_{2.5}$ (U.S. EPA 2013b).

Analysis shows that local emissions from wood stoves, burning distillate oil, industrial sources, and mobile emissions contribute to particulate pollution. For planning purposes, $PM_{2.5}$ is primarily a concern during the winter months (October through March) when extremely strong temperature inversions are frequent and human-caused air pollution impacts increase. Summertime smoke from wildland fires are also a health concern, but are addressed as natural, uncontrollable, exceptional events (ADEC 2014).

Matanuska-Susitna

During times when the Matanuska River is low, windy weather suspends large amounts of silt in the air, which results in high PM concentrations. Several air quality alerts are issued each year in the spring and fall because of windblown dust events (ADEC 2014).

ii. Regulatory Setting

Responsibility for air quality planning involves a wide variety of agencies and groups at the federal, state, regional, and local levels. Some of these agencies have actual regulatory authority, while others are responsible for development and implementation of programs and procedures aimed at reducing air pollution levels.

Federal Regulations

Clean Air Act of 1970 and Amendments. The federal Clean Air Act (CAA) of 1970, amended in 1977 and 1990 (42 USC 7506(c)), was enacted for the purposes of protecting and enhancing the nation's air resources to benefit public health. The CAA Amendments of 1990 represented a substantial update of the act. In 1971, to achieve the purposes of Section 109 of the act, the U.S. EPA promulgated NAAQS for air pollutants that pose a threat to human health and welfare. The NAAQS require that certain pollutants should not exceed specified levels; areas that exceed the standard for

specified pollutants are designated as “non-attainment” areas. Six pollutants of primary concern were designated: ozone, carbon monoxide (CO), sulfur dioxide (SO_2), NO_2, lead, respirable particulate matter with an aerodynamic resistance diameter of 10 microns or less (PM_{10}), and fine particulate matter ($PM_{2.5}$).

As required by the Clean Air Act, the U.S. EPA must:

- Identify those air pollutants that pose a threat to human health;
- Publish criteria for these air pollutant compounds based on the most recent scientific knowledge about the compounds, their interactions, and their effects on human health;
- Include measures and control techniques for these pollutants; and
- Identify the national AAQS for each criteria air pollutant in order to protect public health and welfare.

NAAQSs consist of two parts: the allowable concentration of a criteria pollutant, and the average time period during which the pollutant is to be measured. The concentration standard for the pollutant is based on studies of the effect of the pollutant on human health, crops, vegetation, and in some cases materials (e.g., paint). The average time period is typically based on the adverse effect caused by exposure to that pollutant. Damage from the pollutant is evaluated based on exposure to a high concentration over a short period of time (e.g., one hour) or to a low concentration during a longer period (e.g., eight hours or 24 hours). Some pollutants are evaluated for both time periods due to their effects over the short and long-term.

State Regulations

Alaska Ambient Air Quality Standards. Alaska has adopted and/or proposed ambient air quality standards (AAAQS) that are the same as the federal NAAQS for all criteria pollutants. Alaska also has standards for two additional pollutants: ammonia and reduced sulfur compounds.

d. Biological Resources

i. Existing Conditions

Alaska is the largest and least densely populated state in the U.S., with large areas of natural habitat and bountiful fish and wildlife. Alaska has 656,425 square miles, 44,000 miles of coastline, 3 million lakes, countless streams and rivers, and multiple mountain ranges (ADF&G 2014).

Alaska can generally be divided into four major vegetation zones: (1) coastal forest, (2) boreal forest or taiga, (3) lowland tundra, and (4) upland tundra. Within each of these major vegetation zones, there is a mosaic of vegetation (USFS 1992).

Coastal forests are dominated by closed and open evergreen forests, primarily Sitka spruce-western hemlock. Closed and open deciduous forests are rare and limited primarily to stands of black cottonwood or red alder on flood plains, streamsides, and recently disturbed sites. Woodland lodgepole pine communities grade into bog types (locally called muskegs) on poorly drained sites. On coastal deltas, extensive areas of halophytic and freshwater sedge and grass wet meadows are common (USFS 1992).

Boreal forest or taiga forms an extensive vegetation zone between the coastal forest and the northern and western limits of forest growth. It is dominated by closed, open, and woodland evergreen forests of black and white spruce, but has extensive areas of open and closed deciduous forests of paper birch, aspen, and balsam poplar. Within this vegetation zone are extensive mosaics of shrub and herbaceous types, including extensive areas of subarctic lowland sedge and sedge-moss bog meadows as well as willow, sweetgale, and graminoid bogs. There are also extensive areas of closed and open shrubs of alder and willows in successional communities after fire and alluvial deposition (USFS 1992).

Lowland tundra occurs primarily on the coastal plain in northern Alaska and in low-lying deltas and other coastal areas in western Alaska. The dominant vegetation is a wet sedge meadow of *Eriophorum angustifolium* and *Carex aquafilis* interspersed with many lakes. *Eriophorum vaginatum* tussock tundra occurs on the dryer sites (USFS 1992).

Upland tundra in Alaska includes three major vegetation zones as mapped by most vegetation maps of Alaska; moist tundra, dry or alpine tundra, and shrub or high brush tundra. Over much of arctic and western Alaska, this type is dominated by *Eriophorum vaginatum* tundra with areas of Dryas dwarf shrub tundra on exposed ridges and dry rocky sites. In mountainous areas above treeline, Dryas and ericaceous shrub tundra are the most widespread plant communities. In many areas in western Alaska and in most areas near treeline in the Alaska and Brooks Ranges, the zone includes extensive areas of shrubland, primarily low shrub dwarf birch. On the Aleutian Islands, the most widespread community is Empetrum heath, but extensive areas of dry and mesic graminoid herbaceous vegetation of *Elymus arenarius*, *Calamagrostis nutkaënsis*, and *Deschampsia beringensis* also occur (USFS 1992).

Diverse and abundant wildlife are central to Alaska's economy and people. Over 1,000 vertebrate species are found in the state, sometimes in huge numbers. More than 900,000 caribou roam in 32 herds across vast tundra landscapes. On the Copper River Delta alone, five to eight million shorebirds stop to forage and rest each spring on their

way to arctic breeding grounds. Alaska has 32 species of carnivores, more than any other state. Most of Alaska's fish and wildlife populations are considered healthy. In the rest of the nation, more than 400 species are listed as threatened or endangered. In Alaska, only 20 species are listed this way (ADF&G 2014).

ii. Regulatory Setting

Federal Regulations

Endangered Species Act. The Endangered Species Act (ESA) protects fish and wildlife species and their habitats that have been identified by USFWS or the National Oceanic and Atmospheric Administration's National Marine Fisheries Service (NMFS) as threatened or endangered. *Endangered* refers to species, subspecies, or distinct population segments that are in danger of extinction through all or a significant portion of their range. *Threatened* refers to species, subspecies, or distinct population segments that are likely to become endangered in the near future. The ESA is administered by USFWS and the NMFS. In general, NMFS is responsible for protection of ESA-listed marine species and anadromous fish, whereas other listed species are under USFWS jurisdiction.

Clean Water Act. The Clean Water Act (CWA) was enacted as an amendment to the federal Water Pollution Control Act of 1972, which outlined the basic structure for regulating discharges of pollutants to waters of the U.S. The CWA serves as the primary federal law protecting the quality of the nation's surface waters, including lakes, rivers, and coastal wetlands. The CWA empowers the U.S. EPA to set national water quality standards and effluent limitations and includes programs addressing both point source and nonpoint-source pollution.

Point-source pollution is pollution that originates or enters surface waters at a single, discrete location, such as an outfall structure or an excavation or construction site.

Nonpoint-source pollution originates over a broader area and includes urban contaminants in stormwater runoff and sediment loading from upstream areas. The CWA operates on the principle that all discharges into the nation's waters are unlawful unless specifically authorized by a permit; permit review is the CWA's primary regulatory tool.

Requires the permitting and monitoring of all discharges to surface water bodies. Section 404 requires a permit from the U.S. Army Corps of Engineers (USACE) for a discharge from dredged or fill materials into Waters of the U.S., including 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.

Migratory Bird Treaty Act. The Migratory Bird Treaty Act, enacted in 1918, domestically implements a series of international treaties that provide protection for migratory birds. It authorizes the Secretary of the Interior to regulate the taking of migratory birds and provides that it shall be unlawful, except as permitted by regulations, to pursue, take, or kill any migratory bird, or any part, nest, or egg of any such bird (16 USC 703). This prohibition includes both direct and indirect acts, although harassment and habitat modification are not included unless they result in direct loss of birds, nests, or eggs. The current list of species protected by the Migratory Bird Treaty Act includes several hundred species, which is essentially all the native birds, in the U.S.

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.

Bald and Golden Eagle Protection Act. The Bald and Golden Eagle Protection Act, enacted in 1940 and amended multiple times since, prohibits the taking of bald and golden eagles without a permit from the Secretary of the Interior. Similar to the ESA, the Bald and Golden Eagle Protection Act defines “take” to include “pursue, shoot, shoot at, poison, wound, kill, capture, trap, collect, molest or disturb” (16 USC 668-668c). For the purpose of the act, disturbance that would injure an eagle, decrease productivity, or cause nest abandonment, including habitat alterations that could have these results, are considered take and can result in civil or criminal penalties.

State Regulations

Alaska Endangered Species List. The State of Alaska, Department of Fish and Game (ADF&G) is responsible for determining and maintaining a list of endangered species in Alaska under AS 16.20.190. A species or subspecies of fish or wildlife is considered endangered when the Commissioner of ADF&G determines that its numbers have decreased to such an extent as to indicate that its continued existence is threatened.

e. Cultural Resources

i. Existing Conditions

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. America has 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 U.S. crossed the Bering land bridge into Alaska.

Some of the oldest archeological sites in North America are located in Alaska. During the Pleistocene, northern and central Alaska, experienced a lesser amount of glaciation than did much of North America, including the Northwest Coast. During the height of the last great Wisconsin glaciation, continuous ice Barriers in Alaska were confined to the east-west trending mountain ridges of the north and south. In the Yukon, east of the present-day Alaska border, the mountain glacier systems curved and nearly joined together along the northern extension of the Rocky Mountains. Thus, at the height of the Pleistocene, the Alaskan interior formed a relatively ice-free bowl, covered by "steppe tundra" vegetation (also called mammoth tundra), out of which a narrow, ice-free corridor led eastward and southward, between the Cordilleran and Laurentide ice sheets into the continental interior. Another possible ice-free zone that could have formed a migration route was down the coastal zones into the Pacific northwest. By 10,000 BP, the melting of the ice sheets had removed the barriers and opened all routes from Alaska (NPS 2014).

At the time of European contact, the coast of Alaska north of the Alaska Peninsula was occupied by people adapted to life along winter ice-bound coasts. They spoke two distinct Eskimoan languages. One was spoken eastward as far as Hudson's Bay; and a second was spoken by the Pacific coastal people of the region around Kodiak Island and Prince William Sound, as well as around Norton Sound. From the tip of the Alaska Peninsula and westward throughout the Aleutian Islands, were found the Aleuts, who existed by open-water hunting and fishing and whose language was related to Eskimoan in an Eskaleutian language stock. The Alaskan interior was home to broadly adapted hunters and fishers of the boreal forest. Several distinct languages were spoken by these people, all part of the large Athabaskan family of languages, stretching throughout the boreal forest (NPS 2014).

The majority of the archeological resources of the Alaska Region date from the post-Pleistocene era, roughly the period between 11,500 BP and the coming of the Europeans (circa 1750 AD). These sites document the diverse and changing adaptations of Alaska's major Native groups (NPS 2014).

Another source of the complexity of Alaska's archeological record is the interaction that occurred among the various groups and areas. People did not stay put through time; there was a constant ebb and flow of cultural groups and traits. For example, the Dena'ina Athabaskans apparently expanded out of the interior to dominate a large segment of the southwestern Alaska coast, pushing out Yupik and Chugach Eskimo, in the centuries before European contact. Within a few centuries, however, their material culture, as seen in the archeological record, became difficult to distinguish from their maritime Eskimo neighbors. Trade was also widespread and this promoted the emergence of new cultural variations. The famous Chilkoot Trail of Klondike Gold Rush National Historic Park was originally a major trade route which the coastal Tlingit established and guarded for their trade with the Athabaskan groups of the interior (NPS 2014).

Still another complicating factor and one not found elsewhere in the prehistory of the Americas, was the continuing contact that existed over the millennia between Alaskan Natives and the Old World of northeast Asia. Ideas, goods, and often people moved back and forth across the Bering Strait that separates Alaska from Siberia. We know from local informants that, well into the nineteenth century, Siberian raiders were frequent visitors to the shores of what is now the Bering Land Bridge National Preserve on the Seward Peninsula. Peaceful contact was also frequent. For instance, one of the favored items that passed across the Bering Strait in peaceful times was iron, which reached as far east as Hudson's Bay - a symbol of Alaska's unique connection to the Old World that existed for thousands of years prior to the sailing of Columbus (NPS 2014).

ii. Regulatory Setting

Archaeological and paleontological resources are frequently uncovered during construction of projects that require excavation, while historic resources are generally known. Strict mitigation and protection measures are required whenever such resources are discovered. In addition, there is a general requirement that a cultural resource survey and environmental analysis be prepared prior to commencement of any action, development, or land use change subject to NEPA on lands subject to federal jurisdiction or for projects involving federal funds.

Federal Regulations

Section 106 of the National Historic Preservation Act. Specific regulations regarding compliance with Section 106 of the NHPA state that, although the tasks necessary to comply with Section 106 may be delegated to others, the federal agency is ultimately responsible for ensuring that the Section 106 process is completed according to statute. The Section 106 process is a consultation process that involves

the SHPO throughout; the process also calls for including Native American Tribes and interested members of the public, as appropriate, throughout the process. Implementing regulations for Section 106 (36 CFR 800) detail the following five basic steps.

1) Initiate the Section 106 process.

2) Identify and evaluate historic properties.

3) Assess the effects of the undertaking on historic properties within the area of potential effects (APE).

4) If historic properties are subject to adverse effects, the federal agency, the SHPO, and any other consulting parties (including Native American tribes) continue consultation to seek ways to avoid, minimize, or mitigate the adverse effect. A memorandum of agreement (MOA) is usually developed to document the measures agreed upon to resolve the adverse effects.

5) Proceed in accordance with the terms of the MOA.

National Register of Historic Places. The NRHP is the official list of the nation's recognized cultural resources. Authorized under the NHPA (1966), the NRHP is part of a national program to coordinate and support public and private efforts to identify, evaluate, and protect our historic and archaeological resources. The NPS, under the Secretary of the Interior, administers the NRHP. Properties listed in the NRHP include districts, sites, buildings, structures, and objects that are significant to American history, architecture, archaeology, engineering, and culture. These resources contribute to an understanding of the historical and cultural foundations of the nation.

The NRHP includes:

- All historic areas in the National Park System;
- National Historic Landmarks which have been designated by the Secretary of the Interior for their significance to all Americans; and
- Properties significant to the nation, state, or community which have been nominated by the states, federal agencies,
- and others, and which have been approved by the NPS.

Federal Historic Significance Criteria. For federal projects, cultural resource significance is evaluated in terms of eligibility for listing in the NRHP. NRHP criteria for eligibility are defined below.

The quality of significance in American history, architecture, archaeology, and culture is present in districts, sites, buildings, structures, and objects of state and local importance that possess integrity of location, design, setting, materials, workmanship, feeling and association, and that:

- are associated with events that have made a contribution to the broad pattern of our history;
- are associated with the lives of people significant in our past;
- embody the distinct characteristics of a type, period, or method of construction, or that represent the work of a master, or that possess high artistic values, or that represent a significant and distinguishable entity whose components may lack individual distinction; or
- have yielded, or are likely to yield, information important in prehistory or history (36 CFR 60.4).

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 U.S. federal laws interfered with the traditional religious practices of many American Indians. The Act establishes a national policy that traditional Native American practices and beliefs, sites (and right of access to those sites), and the use of sacred objects shall be protected and preserved.

Native American Graves Protection and Repatriation Act of 1990 (NAGPRA). The intent of NAGPRA is to identify proper Native American ownership and ensure the rightful disposition, or repatriation, of Native American remains and items of cultural patrimony that are in federal possession or control. The regulations implementing the requirements of NAGPRA relating to the inadvertent discovery of human remains of Native American origin are described in 43 CFR 10.4.

Section 4(f) Requirements. Historic and cultural resources are also protected under regulations of the NHPA and the Department of Transportation Act of 1966. Section 4(f) of the Transportation Act requires a comprehensive evaluation of all environmental impacts resulting from federal-aid transportation projects administered by the Federal Highway Administration, Federal Transit Administration, and Federal Aviation Administration that involve the use—or interference with use—of the following types of land: Public park lands, Recreation areas, Wildlife and waterfowl refuges, Publicly or privately owned historic properties of federal, state, or local significance.

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.

In August 2005, Section 4(f) was amended to simplify the process and approval of projects that have only de minimis impacts on lands affected by Section 4(f). Under the new provisions, the U.S. Secretary of Transportation may find such a de minimis impact if consultation with the SHPO results in a determination that a transportation project will have no adverse effect on the historic site or that there will be no historic properties affected by the proposed action. In this instance, analysis of avoidance alternatives is not required and the Section 4(f) evaluation process is complete.

Native American Heritage Commission. The NAHC regulates Native American concerns toward the excavation and disposition of Native American cultural resources. Among its duties, the NAHC is authorized to resolve disputes relating to the treatment and disposition of Native American human remains and items associated with burials. Upon notification of the discovery of human remains by a coroner, the NAHC notifies the Native American group or individual most likely descended from the deceased.

f. Energy Demand

i. Existing Conditions

In 2011, the mix of sources of Alaska's energy generation consists of 58 percent natural gas, 20 percent hydropower, 16 percent oil, 6 percent coal, and 0.3 percent wind (AEA 2012). On the demand side, Alaskans ranked third in the U.S. for total energy consumed per capita by consuming 881 million btu per capita (U.S. EIA 2011). In 2012, 50.8 percent of energy consumption came from the industrial sector, 29.7 percent transportation, 10.9 percent commercial, and only 8.6 percent residential.

ii. Regulatory Setting

Federal Regulations

Energy Policy Act of 2005. The Energy Policy Act of 2005 was signed into law on August 8, 2005. Generally, the act provides for renewed and expanded tax credits for electricity generated by qualified energy sources, such as landfill gas; provides bond financing, tax incentives, grants, and loan guarantees for a clean renewable energy and rural community electrification; and establishes a federal purchase requirement for renewable energy.

Federal Climate Change Policy. According to the U.S. EPA, "the U.S. government has established a comprehensive policy to address climate change" that includes slowing the growth of emissions; strengthening science, technology, and institutions; and enhancing international cooperation. To implement this policy, "the Federal government is using voluntary and incentive-based programs to reduce emissions and

has established programs to promote climate technology and science." The federal government's goal is to reduce the GHG intensity (a measurement of GHG emissions per unit of economic activity) of the American economy by 18 percent over the 10-year period from 2002 to 2012. In addition, the U.S. EPA administers multiple programs that encourage voluntary GHG reductions, including "ENERGY STAR," "Climate Leaders," and Methane Voluntary Programs. However, as of this writing, there are no adopted federal plans, policies, regulations, or laws directly regulating GHG emissions.

g. Soils, Geology, and Minerals

i. Existing Conditions

The geology of the U.S., including Alaska, 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.

Alaska's geologic history is associated with episodes of tectonic activity, whose major features were shaped about 125 million years ago. Alaska is influenced by the movements of two major plates, the Pacific plate and the North American plate and is the most tectonically active region in the U.S. The Pacific plate moves northwest relative to the North American plate at a rate of about five to seven centimeters per year. The Pacific plate is made of oceanic crust, which is denser than the continental crust of the North American plate. At the boundary along the northern edge of the Pacific plate, the Pacific plate subducts, or slides, under the North American plate. This subduction zone forms a deep ocean trench—the Aleutian Trench. As the subducting plate descends into Earth's hot interior, the heat causes melting of the overlying material, creating magma. The magma then rises and forms an arc of volcanoes along the boundary. This process is responsible for the formation of the volcanic mountains of the Aleutian Range and the Aleutian Islands.

Other mountains in Alaska, including the Wrangell, St. Elias, and Chugach ranges, were also formed by the action of plate tectonics. In particular, at the bend along the boundary between the Pacific and North American plates, there is a fragment of crust—called the Yakutat block—that is in the process of accreting, or attaching, to North America. This piece of crust, called a terrane, is a piece of another plate, with a different geological history, that has been moved by tectonics. The collision of the plates has built the mountain ranges over millions of years and, even now, continues to push them higher (PBS 2009).

Alaska's land is abundant in a variety of mineral resources from Au (gold) to Zn (zinc). Gold is Alaska's most valuable non-energy commodity. The state's second most valuable non-energy commodity is sand and gravel and the third is copper. The North Slope of Alaska provides approximately 25 percent of the oil produced in the U.S. Alaska ranks second among the states in oil production after Texas (Alaska Public Lands Information Centers 2014).

ii. Regulatory Setting

Federal Regulations

Clean Water Act 402/National Pollutant Discharge Elimination System. The Clean Water Act (CWA) is discussed in detail in the Hydrology and Water Quality chapter. However, because CWA 402 is directly relevant to excavation and grading, additional information is provided below. Amendments in 1987 to the CWA added Section 402p, which establishes a framework for regulating municipal and industrial stormwater discharges under the National Pollutant Discharge Elimination System (NPDES) program. The U.S. EPA has delegated to the Alaska Department of Environmental Conservation (DEC) the authority for the NPDES program in the state. Under the NPDES Phase II Rule, construction activity disturbing 1 acre or more must obtain coverage under the state's General Permit for Discharges of Storm Water Associated with Construction Activity (General Construction Permit). Proponents of specific projects under the MTP 2035 that would disturb one or more acres will be required to obtain a General Construction Permit, prepare a Notice of Intent and a Storm Water Pollution Prevention Plan (SWPPP), and implement and maintain BMPs to avoid adverse effects on water quality as a result of construction activities, including earthwork.

Earthquake Hazards Reduction Act. In October 1977, the U.S. Congress passed the Earthquake Hazards Reduction Act to reduce the risks to life and property from future earthquakes in the U.S. through the establishment and maintenance of an effective earthquake hazards and reduction program. To accomplish this, the Act established the National Earthquake Hazards Reduction Program (NEHRP). This program was significantly amended in November 1990 by the National Earthquake Hazards Reduction Program Act (NEHRPA) by refining the description of agency responsibilities, program goals and objectives.

Mining and Mineral Policy Act. The Mining and Mineral Act of 1970 declared that the Federal Government policy is to encourage private enterprise in the development of a sound and stable domestic mineral industry, domestic mineral deposits, minerals research, and methods for reclamation in the minerals industry.

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.

Seismic Hazards Mapping Act, PRC Section 2690–2699. The Seismic Hazards Mapping Act (the Act) of 1990 (Public Resources Code, Chapter 7.8, Division 2) directs states 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. The Act requires that site-specific geotechnical investigations be performed prior to permitting most urban development projects within seismic hazard zones.

h. Greenhouse Gases

i. Existing Conditions

See the 2010 FED Environmental Setting for a description existing conditions with respect to GHG emissions. No new information is available that would apply specifically to Alaska.

ii. Regulatory Setting

Federal Regulations

Federal Climate Change Policy. According to the U.S. EPA, “the U.S. government has established a comprehensive policy to address climate change” that includes slowing the growth of emissions; strengthening science, technology, and institutions; and enhancing international cooperation. To implement this policy, “the Federal government is using voluntary and incentive-based programs to reduce emissions and has established programs to promote climate technology and science.” The federal government’s goal is to reduce the GHG intensity (a measurement of GHG emissions per unit of economic activity) of the American economy by 18 percent over the 10-year period from 2002 to 2012. In addition, the U.S. EPA administers multiple programs that encourage voluntary GHG reductions, including “ENERGY STAR,” “Climate Leaders,” and Methane Voluntary Programs. However, as of this writing, there are no adopted federal plans, policies, regulations, or laws directly regulating GHG emissions.

i. Hazards and Hazardous Materials

i. Existing Conditions

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., pozzolans, foams).

Naturally occurring hazardous materials in the U.S. include asbestos, radon, and mercury. Asbestos is a naturally occurring mineral composed of long, thin, fibrous crystals. Naturally occurring asbestos (NOA) occurs in mineral deposits in Alaska. Due to geography, land mass, limited road systems and relatively sparse and scattered population centers within Alaska, NOA has not been a historical concern for the state. However, over the past several years NOA has been encountered in Alaska and has impacted state projects. Meanwhile the Alaska Department of Transportation & Public Facilities (ADOT) has an ever-increasing demand for gravel and rock to construct and repair the state's roads and airports. Large construction projects such as the proposed gas line or railroad extension will require gravel and rock source development (AUTC and ADOT 2009).

ii. Regulatory Setting

Federal Regulations

Management of Hazardous Materials. Federal laws require planning to ensure that hazardous materials are properly handled, used, stored, and disposed of, and if such materials are accidentally released, to prevent or mitigate injury to health or the environment. The U.S. EPA is the agency primarily responsible for enforcement and implementation of federal laws and regulations pertaining to hazardous materials. Applicable federal regulations pertaining to hazardous materials are primarily contained in Code of Federal Regulations (CFR) Titles 29, 40, and 49. Hazardous materials, as defined in the Code, are listed in 49 CFR 172.101. Management of hazardous materials is governed by the following laws.

- The Resource Conservation and Recovery Act of 1976 (RCRA) (42 U.S. Code [USC]] 6901 et seq.) is the law under which the U.S. EPA regulates hazardous

waste from the time the waste is generated until its final disposal ("cradle to grave").

- The Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (also called the Superfund Act or CERCLA) (42 USC 9601 et seq.) gives U.S. EPA authority to seek out parties responsible for releases of hazardous substances and ensure their cooperation in site remediation.
- The Superfund Amendments and Reauthorization Act (SARA) of 1986 (Public Law 99-499; USC Title 42, Chapter 116), also known as SARA Title III or the Emergency Planning and Community Right-to-Know Act of 1986 (EPCRA), imposes hazardous materials planning requirements to help protect local communities in the event of accidental release.
- The Spill Prevention, Control, and Countermeasure (SPCC) rule includes requirements for oil spill prevention, preparedness, and response to prevent oil discharges to navigable waters and adjoining shorelines. The rule requires specific facilities to prepare, amend, and implement SPCC Plans. The SPCC rule is part of the Oil Pollution Prevention regulation, which also includes the Facility Response Plan rule.

Transport of Hazardous Materials. The US Department of Transportation regulates transport of hazardous materials between states and is responsible for protecting the public from dangers associated with such transport. The federal hazardous materials transportation law, 49 USC 5101 et seq. (formerly the Hazardous Materials Transportation Act 49 USC 1801 et seq.) is the basic statute regulating transport of hazardous materials in the U.S. Hazardous materials regulations are enforced by the Federal Highway Administration, the US Coast Guard, the Federal Railroad Administration, and the Federal Aviation Administration (FAA).

Hazardous Waste Management. RCRA requires a comprehensive regulatory system for handling hazardous wastes in a manner that protects human health and the environment. This regulatory system includes tracking all generators of hazardous waste.

j. Hydrology, Water Quality, and Supply

i. Existing Conditions

Alaska's abundance of rivers, lakes, wetlands, snowfields, and glaciers comprise an estimated 40 percent of the Nation's surface water. There are more than 12,000 rivers in Alaska, and three of those rivers, the Yukon, the Kuskokwim, and the Copper, are among the ten largest rivers in the U.S. Alaska has more than 3 million lakes ranging from pond size to 1,000 square miles. Despite Alaska's wealth of water, its water resources are not uniformly distributed geographically or seasonally. Annual

precipitation ranges from an average of five inches on the Arctic Slope to an average of 300 inches in the maritime rain forests of Southeast Alaska. Glaciers and icefields cover about 5 percent and permafrost underlies approximately 85 percent of Alaska, which affect the timing and quantity of runoff. Many rivers are affected by ice-jam flooding during spring breakup, and many are ice covered much of the year (USFWS 2010).

Groundwater is a source of drinking water for about 50 percent of Alaska's population, and 90 percent of the state's rural residents. Eighty-seven percent of Alaska's 1,546 public drinking water systems use a groundwater source. A small number of public water systems (e.g., Anchorage and several southeastern communities) serve a large number of people from primarily surface water sources. Ninety percent of the private drinking water supplies are groundwater. Of approximately 330 million gallons of water used each day for domestic, commercial, industrial, and agricultural purposes in Alaska, roughly 23 percent is derived from aquifers (ADEC 2005).

Groundwater is available in most areas of Alaska, except where permafrost is very deep in the northern part of the state. South-central and interior Alaska have the greatest dependence on groundwater. Arctic, western, and southeastern Alaska make more frequent use of streams, rivers, lakes, and rainwater catchments. The largest groundwater withdrawals occur in the Anchorage and Fairbanks areas, and to a lesser extent, the Matanuska-Susitna and Kenai Peninsula Boroughs in the south-central portion of the state. Most of Alaska's aquifers consist of unconsolidated materials derived from glaciers, rivers, and streams. Producing aquifers are typically unconfined (i.e., not protected by a layer of clay or silt), and the depth to groundwater ranges from a few feet to over 400 feet statewide (ADEC 2005).

Although water quality data are sparse, most of the state's groundwater is suitable for domestic, agriculture, aquaculture, commercial, and industrial uses with moderate or minimal treatment. Naturally occurring iron, manganese, and arsenic are the most common treatment problems in groundwater systems. Storage and spills of fuel, along with wastewater disposal, primarily from onsite (septic) systems, are common threats to groundwater quality statewide. Additionally, a range of other activities either have potentially or actually affected groundwater quality (e.g., nonpoint pollution in urban areas, natural resource extraction activities in remote locations, and a wide range of potential point sources of pollution). Prevention of human exposure to contaminated groundwater is a main focus of the department's program to remedy new and historic contamination, where leaking underground fuel tanks and other releases of oil and hazardous substances may have occurred. Efforts have been on-going since the late 1980s. Groundwater is known to be contaminated at 1,330 sites. Cleanup of groundwater is a lengthy process and is the biggest constraint to complete closure of

contaminated sites. During the cleanup, primary efforts are to prevent use of the water for drinking and to monitor the status of contamination. Alaska's contaminated sites include seven Superfund sites where cleanups have been under way for a number of years.

ii. Regulatory Setting

Federal Regulations

Clean Water Act. Enacted by Congress in 1972 as the first comprehensive national clean water legislation to protect our nation's waters, the CWA mandates cooperative effort by federal, state, and local governments to implement its pollution control measures. The law is intended to improve the quality of the nation's waters using a framework of standards, technical tools, and financial assistance to address pollution and poor water quality. The CWA is the primary federal law that protects the quality of the nation's surface waters, including lakes, rivers, and coastal wetlands. It operates on the principle that all discharges into the nation's waters are unlawful unless specifically authorized by a permit; permit review is the CWA's primary regulatory tool. The CWA requires that NPDES permits be obtained for any discharges to surface waters by a point source and for municipal and industrial stormwater discharges. The following paragraphs provide additional details on NPDES permits and specific sections of the CWA that could apply to specific activities, related to subsequent measure development and projects within the state, including construction and effluent discharge.

Impaired Water Bodies. Under CWA Section 303(d), Alaska is required to establish beneficial uses of state waters and to adopt water quality standards to protect those beneficial uses. Section 303(d) establishes the total maximum daily load (TMDL) process to assist in guiding the application of state water quality standards, requiring the states to identify streams whose water quality is "impaired" (affected by the presence of pollutants or contaminants) and to establish the TMDL, or the maximum quantity of a particular contaminant that a water body can assimilate without experiencing adverse effects. CWA Section 303(d) also requires the state to identify water bodies that do not meet water quality standards and thus exhibit impaired beneficial uses.

Water Quality Certification. Under CWA Section 401, applicants for a federal license or permit to conduct activities that may result in the discharge of a pollutant into waters of the U.S. must obtain certification from the state in which the discharge would originate, or, if appropriate, from the interstate water pollution control agency with jurisdiction over affected waters at the point where the discharge would originate. Therefore, all projects that have a federal component and may affect the quality of the

state's waters (including projects that require federal agency approval, such as issuance of a Section 404 permit) must also comply with CWA Section 401.

Surface Water Discharges. CWA Section 402 regulates discharges to surface waters through the NPDES program, administered by the U.S. EPA. In Alaska, the DEC has the authority for the NPDES program. The NPDES program provides for both general permits (those that cover a number of similar or related activities) and individual permits.

Construction Activities. As of February 2003, the U.S. EPA requires that a project proponent apply for an NPDES stormwater permit and develop a Storm Water Pollution Prevention Plan (SWPPP) for ground-disturbing activities that would affect 1 acre or more. The General Construction Permit requires the preparation and implementation of a SWPPP, which must be completed before construction begins.

Fill Placement in Waters and Wetlands. CWA Section 404 regulates the discharge of dredged and fill materials into "waters of the U.S.," which include oceans, bays, rivers, streams, lakes, ponds, and wetlands. Project applicants must obtain a permit from the USACE) for all discharges of dredged or fill material into waters of the United States, including wetlands, before proceeding with a proposed activity. Before any actions that may adversely affect surface waters are carried out, a delineation of jurisdictional waters of the U.S. must be completed, following USACE protocols, to determine whether the permit study area encompasses wetlands or other waters of the U.S. that qualify for CWA protection. These include any or all of the following.

- Areas within the ordinary high water mark of a stream, including non-perennial streams with a defined bed and bank, and any stream channel that conveys natural runoff, even if it has been realigned.
- Seasonal and perennial wetlands, including coastal wetlands.

Wetlands are defined for regulatory purposes as areas "inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions" (33 CFR 328.3, 40 CFR 230.3). Refer to the Biological Resources chapter for more information on wetlands regulation.

k. Land Use Planning

i. Existing Conditions

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.

Alaska State law requires that home rule, first and second class boroughs, unified municipalities, and first class and home rule cities outside of boroughs provide planning, platting and land use regulation.

Land use planning for state-owned lands is the responsibility of the Department of Natural Resources (DNR). Within the DNR, the Resource Assessment & Development Section of the Division of Mining, Land and Water has primary responsibility for land use planning. There are two types of plans for state-owned land.

Area Plans

- Usually covers large areas (one planning area encompassed 19 million acres of state owned land), but are also developed for areas of 250,000 acres;
- Establish goals, policies, management intent, and guidelines for the use of state land;
- Allocate the use of state land through plan designations;
- Include recommendations to retain or sell land, open or close areas to mineral entry, establish selection priorities or special land use designations, recommend legislative designations, and
- Take two to three years to prepare.

Management Plans

- Provide more detailed guidance for special areas (like recreation river corridors) or for a specific resource (like forestry), and
- Take one to two years to complete.

ii. Regulatory Setting

State Regulations

State Park Units. The Division of Parks and Outdoor Recreation provides outdoor recreation opportunities and conserves and interprets natural, cultural, and historic resources for the use, enjoyment, and welfare of the people. The Alaska Division of Parks and Outdoor Recreation is responsible for approximately 67 trails, comprising

more than 650 miles (not including water trails) within 128 units of the State system (ADNR 2009).

Local Regulations

City and Borough. Alaska State Law requires that home rule, first and second class boroughs, unified municipalities, and first class and home rule cities outside of boroughs provide planning, platting and land use regulation.

l. Noise

i. Existing Conditions

See the 2010 FED Environmental Setting for a description existing conditions with respect to noise. No new information is available that would apply specifically to Alaska.

ii. Regulatory Setting

Federal Regulations

The federal Noise Control Act of 1972 (Public Law 92-574) established a requirement that all federal agencies administer their programs to promote an environment free of noise that would jeopardize public health or welfare. The U.S. EPA was given the responsibility for:

- providing information to the public regarding identifiable effects of noise on public health and welfare,
- publishing information on the levels of environmental noise that will protect the public health and welfare with an adequate margin of safety,
- coordinating federal research and activities related to noise control, and
- establishing federal noise emission standards for selected products distributed in interstate commerce.

The Noise Control Act also directed that all federal agencies comply with applicable federal, state, interstate, and local noise control regulations. Although the U.S. EPA was given a major role in disseminating information to the public and coordinating with other federal agencies, each federal agency retains authority to adopt noise regulations pertaining to agency programs. The U.S. EPA can, however, require other federal agencies, such as those listed below, to justify their noise regulations in terms of Noise Control Act policy requirements.

- Federal Highway Administration (FHWA): Noise standards for federally funded highway projects.
- Federal Transit Administration (FTA): Noise standards for federally funded transit projects.
- Federal Railroad Administration (FRA): Noise standards for federally funded rail projects.

U.S. Environmental Protection Agency. In 1974, in response to the requirements of the federal Noise Control Act, the U.S. EPA identified indoor and outdoor noise limits to protect public health and welfare (communication disruption, sleep disturbance, and hearing damage). Outdoor L_{dn} limits of 55 dB and indoor L_{dn} limits of 45 dB are identified as desirable to protect against speech interference and sleep disturbance for residential, educational, and healthcare areas. Sound-level criteria to protect against hearing damage in commercial and industrial areas are identified as 24-hour L_{eq} values of 70 dB (both outdoors and indoors).

Federal Transit Administration. FTA procedures for the evaluation noise from transit projects are specified in the document titled, "Transit Noise and Vibration Impact Assessment" (Federal Transit Administration, 2006). The FTA Noise Impact Criteria categorizes noise-sensitive land uses into the following categories.

- *Category 1*: Buildings or parks where quiet is an essential element of their purpose.
- *Category 2*: Residences and buildings where people normally sleep. This includes residences, hospitals, and hotels where nighttime sensitivity is assumed to be of utmost importance.
- *Category 3*: Institutional land uses with primarily daytime and evening use. This category includes schools, libraries, churches, and active parks.

L_{dn} is used to characterize noise exposure for residential areas (Category 2). For other noise sensitive land uses, such as outdoor amphitheaters and school buildings (Categories 1 and 3), the maximum 1-hour L_{eq} during the facility's operating period is used. Noise impacts are identified based on absolute predicted noise levels and increases in noise associated with the project.

m. Employment, Population, and Housing

i. Existing Conditions

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).

According to the 2010 census, the population of Alaska was 710,231 (U.S. Census Bureau 2010). As the population within the State changes, housing distribution and household conditions are expected to evolve. Existing housing units, households, and vacancy rates for the State of Alaska are shown below in Table C-2. Data were derived from the U.S. Census 2008-2012 American Community Survey. Alaska has a 8.4 percent unemployment rate (U.S. Census Bureau 2008-2012 ACS).

Table C-2
Alaska Housing Profile

Total Housing Units	305,445
Total Households	252,991
Vacant housing units	52,454
Owner-occupied	162,891
Renter-occupied	90,100
Homeowner vacancy rate	1.4
Rental vacancy rate	5.4

Source: U.S. Census Bureau 2008-2012 American Community Survey

ii. Regulatory Setting

Federal Regulations

23 Code of Federal Regulations (CFR) Part 450.322. The Code of Federal Regulations pertaining to the Department of Transportation contains guidelines for statewide and metropolitan transportation planning. These were last updated on August 10, 2005 when the Safe, Accountable, Flexible, Efficient, Transportation Equity Act: A Legacy for Users (SAFETEALU) was enacted. The rules and regulations require that the metropolitan planning organization (MPO) review and update the transportation plan to confirm the transportation plan's validity and consistency with current and forecasted transportation and land use conditions and trends and to extend the forecast period to at least a 20-year planning horizon.

Local Regulations

City and Borough. Alaska State Law requires that home rule, first and second class boroughs, unified municipalities, and first class and home rule cities outside of boroughs provide planning, platting and land use regulation, which would include discussion of housing needs.

n. Public Services

i. Existing Conditions

Law Enforcement

Statewide law enforcement service in Alaska is provided by the Alaska State Troopers and Alaska Wildlife Troopers. Alaska State Troopers are responsible for protecting state resources and providing crime prevention services and traffic enforcement along the State's highways and byways. Alaska Wildlife Troopers are responsible for protecting Alaska's natural resources.

Local law enforcement service is also provided by local agencies to prevent crime, respond to emergency incidents, and provide traffic enforcement on local roadways.

Fire Protection and Emergency Medical Response Services

The U.S. Forest Service (USFS) is an agency of the U.S. Department of Agriculture that administers the nation's 155 national forests and 20 national grasslands, which encompass 193 million acres (780,000 km^2). 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 USFS 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.

Alaska statewide fire protection and emergency response service is provided by the Division of Fire and Life Safety. The mission of the Division of Fire and Life Safety is to prevent the loss of life and property from fire and explosion.

Local fire protection service is provided by local fire districts and/or local agencies. In addition to providing fire response services most fire agencies also provide emergency medical response services (i.e., ambulance services) within their service areas.

Schools

Education is primarily a state and local responsibility in the U.S., including Alaska. States and communities, as well as public and private organizations, establish schools, develop curricula, and determine requirements for enrollment and graduation. (U.S. Dept. of Education 2014). In Alaska, the regulation of education for youth is provided by the Alaska Department of Education & Early Development.

Locally, school districts are responsible for the management and development of elementary, middle, and high-school facilities. Throughout Alaska there are 55 school districts.

ii. Regulatory Setting

Local Regulations

City and Borough. Alaska State Law requires that home rule, first and second class boroughs, unified municipalities, and first class and home rule cities outside of boroughs provide planning, platting and land use regulation.

o. Recreation

i. Existing Conditions

Recreational resources and facilities are provided and managed at federal, state, and local levels. The federal government is the largest landowner in Alaska with 60% of the total area (222 million acres). This acreage includes national parks, wildlife refuges, national forests, military reservations and the North Slope National Petroleum Reserve. More than a dozen federal agencies manage federal lands in Alaska. The majority of federally owned lands have been set aside for public use (approximately 80 million acres). These lands are managed by the National Park Service (NPS), USFWS, USFS, and BLM. The remaining federal land is designated for special purposes, such as military reservations, the National Petroleum Reserve and U.S. Postal Service lands (ADNR 2000).

Alaska owned land is managed for settlement, resources, and recreation. Recreation lands are managed for wildlife, back-country recreation, and varying degrees and types of developed recreation.

Recreational lands and facilities are also managed by cities, boroughs, and other local agencies.

ii. Regulatory Setting

State Regulations

State Park Units. The Division of Parks and Outdoor Recreation provides outdoor recreation opportunities and conserves and interprets natural, cultural, and historic resources for the use, enjoyment, and welfare of the people. The Alaska Division of Parks and Outdoor Recreation is responsible for approximately 67 trails, comprising more than 650 miles (not including water trails) within 128 units of the State system (DNR 2009).

Navigable Waters. The Alaska Constitution (Article VIII, Sections 1, 2, 3, 6, 13, and 14) contains numerous provisions embracing principles of the Public Trust Doctrine that require the state to exercise authority to ensure that the right of the public to use navigable waters for navigation, commerce, recreation, and related purposes is protected. In Alaska, the Public Trust Doctrine extends beyond those submerged lands to which the state holds title to include all navigable waters. The State's waters are themselves reserved to the people for common use.

p. Transportation and Traffic

i. Existing Conditions

See the 2010 FED Environmental Setting for a description existing conditions with respect to Transportation and Traffic. No new information is available that would apply specifically to Alaska.

ii. Regulatory Setting

Federal Regulations

Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU). Under SAFETEA-LU, the U.S. Department of Transportation, Federal Highway Administration (FHWA), and Federal Transit Administration (FTA) require that Metropolitan Planning Organizations (MPO's) prepare and submit a metropolitan transportation plan. In regions that are designated federal air quality non-attainment areas, these plans must be updated at least every four years. The federal requirements for metropolitan transportation plans include a number of key provisions that are outlined below.

- Plans must be developed through an open process that encourages and includes public input
- Plans must cover a period of at least 20 years into the future

- Plans must reflect the most recent assumptions for population, employment, land use, travel,
- congestion, and economic activity
- Plans must be financially conservative and must contain reasonable revenue assumptions
- Plans must conform to the SIP for air quality
- Plans must meet the air quality budget set for the SIP
- Plans must consider key planning factors in the local context such as economic vitality, safety, security, accessibility and mobility of people and freight, environmental protection, transportation system integration, system efficiency, and preservation of existing transportation system.

q. Utilities and Service Systems

i. Existing Conditions

Electricity and Natural Gas

Alaska does not have a vast infrastructure of transmission interties that span the horizons throughout the rest of the North American continent. Alaska also lacks an extensive interconnected road system to link cities, towns and villages. Most electric power in Alaska comes from fossil fuels, natural gas or diesel fuel. However, some alternative energy sources are already in use. More than 50 hydroelectric power plants supply Alaska communities, from the six-megawatt Power Creek plant serving 2,700 Cordova area residents to the 126-megawatt Bradley Lake plant near Homer that generates power for Alaskans from the Kenai Peninsula to Fairbanks. In addition to hydro, other types of alternative energy are being utilized by electric utilities around the state. The first utility-grade wind power farm in Alaska began operating in 1997 in Kotzebue. Chugach Electric Association operated the nation's second largest fuel cell of its kind at the U.S. Postal Service main office in Anchorage. Golden Valley Electric Association of Fairbanks operated the world's largest utility-grade battery storage system (Alaska Power Association 2014).

Solid Waste

ADEC is responsible for solid waste management, which includes landfills, treatment systems, and solid waste storage facilities. Local municipalities or private companies own and operate landfill facilities and solid waste is typically hauled to these facilities by public or private haulers.

Wastewater Collection and Treatment

The ADEC Division of Water is the State agency responsible for the regulation of wastewater discharges. The ADEC is responsible for administering the wastewater discharge permitting and compliance program in Alaska (ADEC 2012).

ii. Regulatory Setting

Federal Regulations

See related regulations in the Energy Regulatory Setting section.

2. Beneficial Impacts

In accordance with ARB's CEQA certified regulatory program, as well as considering the legislative intent of AB 32 and the latitude under CEQA to recognize environmental co-benefits (beneficial impacts), this supplemental EA incorporates discussion of potential beneficial environmental impacts when those impacts are considered reasonable and foreseeable, and they are relevant to the decisions to be made by ARB regarding the proposed updated Forest Protocol. In most instances it is not possible to quantify these impacts because of the broad nature of this programmatic analysis. Any beneficial impacts associated with the proposed updated Forest Protocol are included in the impact assessment for each resources area listed below.

3. Resource Area Impacts

The proposed updated Forest Protocol would not result in any new types of potentially significant adverse impacts on the physical environment that were not already addressed in the 2010 FED. As previously indicated, ARB staff used the CEQA Guidelines Checklist to determine whether the proposed updated Forest Protocol may result in potentially adverse environmental impacts. The impact analysis focuses on potential environmental effects of the proposed updated Forest Protocol in Alaska as a result of extending eligibility for forest projects to that state.

a. Aesthetics

i. Impacts Analysis

As described in the 2010 FED, reasonably foreseeable compliance responses associated with implementation of the Forest Protocol were found to result in **less-than-significant** aesthetics impacts (ARB 2010). Thus, no mitigation for aesthetics was identified in the 2010 FED (ARB 2010).

Specifically, as stated in the 2010 FED, reforestation and avoided conversion projects would be expected to result in long-term beneficial effects on scenic resources as the activity would result in increased tree cover in previously disturbed areas or protection of the forest in perpetuity. Also, with regards to regular silvicultural or timber harvest activities, these changes may cause some diminished scenic value in localized areas, the limited acreage and other requirements, such as use of native species and uneven aged management, in the Forest Protocol would serve to minimize or moderate such impacts. Lastly, aesthetic impacts would not be expected to differ substantially from the existing management practices in the project areas.

As explained above, the proposed updated Forest Protocol, specifically the addition of Alaska to the states eligible for forest projects, would not change the reasonably foreseeable compliance responses as evaluated in the 2010 FED. Forest protocol related-activities associated with this update would occur in Alaska in the same manner as was evaluated in the 2010 FED. Therefore, implementation of the proposed updated Forest Protocol would not result in any potential aesthetics impacts in addition to those already evaluated and disclosed in the 2010 FED, as summarized above and incorporated by reference.

ii. Mitigation Measures

Mitigation is not warranted.

b. Agriculture and Forest Resources

i. Impacts Analysis

As described in the 2010 FED, reasonably foreseeable compliance responses associated with implementation of the Forest Protocol were found to result in **less-than-significant** agriculture and forest resource impacts (ARB 2010). Thus, no mitigation for agriculture and forest resources was identified in the 2010 FED (ARB 2010).

Specifically, as stated in the 2010 FED, it was not expected that reforestation projects would be proposed or approved on lands used productively for agriculture or under Williamson Act contract under existing conditions. Forest projects would occur on land that currently supports or historically supported forests. Also, avoided conversion projects would similarly not result in the conversion of agricultural land to non-agricultural uses because avoided conversion projects would prevent land currently used as forestland from being converted to non-forest uses, including land used for agriculture under existing conditions. And improved forest management would improve existing forested land and not convert forested land to other uses. Overall, the potential to conflict with existing agricultural or forest production zoning designations would be

less than significant, because existing managed or formerly managed forests would likely already be designated for that use (such as a timber production zone) and productive, agriculturally zoned land would not be expected to experience conversion for reasons stated previously. Impacts to forest resources were also considered less than significant, because reforestation projects were not expected to conflict with existing zoning for forest land, timberland, or timber production zone or result in conversion of forest to non-forest land or loss of forest land.

As explained above, the proposed updated Forest Protocol, specifically the addition of Alaska to the states eligible for forest projects, would not change the reasonably foreseeable compliance responses as evaluated in the 2010 FED. Forest protocol related-activities associated with this update would occur in Alaska in the same manner as was evaluated in the 2010 FED. Therefore, implementation of the proposed updated Forest Protocol would not result in any potential agriculture or forest resource impacts in addition to those already evaluated and disclosed in the 2010 FED, as summarized above and incorporated by reference.

ii. Mitigation Measures

Mitigation is not warranted.

c. Air Quality

i. Impacts Analysis

As described in the 2010 FED, reasonably foreseeable compliance responses associated with implementation of the Forest Protocol were found to result in **less-than-significant** air quality impacts (ARB 2010). Thus, no mitigation for air quality was identified in the 2010 FED (ARB 2010).

Specifically, as stated in the 2010 FED, the potential for use of mobile forestry equipment, employment of forest offset project personnel, and forest biomass transport activities could result in emissions of criteria air pollutants (and precursors). Reforestation activities could result in emissions that are short-term, construction-like in nature. Other silvicultural activities involving timber harvesting or thinning could result in emissions that are long-term, operational in nature. Forest projects would occur on land that currently support or historically supported forests. Forested land is typically subject to periodic forest management activities, such as thinning, hazardous fuel removal, replanting, and/or potentially timber harvest, as determined by land ownership and market conditions. Establishing a forest offset project would not result in the exercise of forest management activities where they could not already occur or have occurred in the past under historically forested conditions in some form. Therefore, substantial

differences in air pollutant emission generation (including toxic air contaminates and odors) from current management practices would not be expected.

As explained above, the proposed updated Forest Protocol, specifically the addition of Alaska to the states eligible for forest projects, would not change the reasonably foreseeable compliance responses as evaluated in the 2010 FED. Forest protocol related-activities associated with this update would occur in Alaska in the same manner as was evaluated in the 2010 FED. Therefore, implementation of the proposed updated Forest Protocol would not result in any potential air quality impacts in addition to those already evaluated and disclosed in the 2010 FED, as summarized above and incorporated by reference.

ii. Mitigation Measures

Mitigation is not warranted.

d. Biological Resources

i. Impacts Analysis

As described in the 2010 FED, reasonably foreseeable compliance responses associated with implementation of the Forest Protocol were found to result in **significant and unavoidable** impacts to biological resources (ARB 2010).

While the intended and generally expected result of reforestation projects would be beneficial for biological resources, the potential exists for adverse impacts to biological resources occupying the existing habitat in the project area. Existing habitats of reforestation projects are likely to either consist of understocked forest land or transitional and potentially disturbed habitat on land that was formerly forested, but has had vegetation eliminated in the past by removal (e.g., historic timber harvest) or natural events (e.g., wildfire). Habitat conditions would change with implementation of reforestation projects, including removal of existing and planting of new vegetation. Wildlife species occupying the existing habitat on reforestation project lands could be disturbed and/or displaced to nearby suitable habitat as a result of the reforestation project activities and habitat changes, and wildlife could be lost. Habitat changes and wildlife disruption resulting from implementation of reforestation projects could have a potentially significant impact on biological resources.

Potential short-term ground-disturbing activities for reforestation projects would include tree planting, installation of irrigation systems, or clearing of debris or other forest products from the ground to allow for natural reforestation. Small tools would be used to maintain the planted trees or remove dead, diseased or dying trees that would be

replaced. Large mechanized equipment could be used, especially for the removal of dead, diseased, or dying trees, or for soil preparation. In addition, herbicides and rodenticides could be used to reduce competition with weeds or herbivores. Many reforestation project areas are expected to be in a degraded state, so it would be unlikely for special-status species or sensitive habitats to be present. In addition, projects are required to follow local, state and/or federal regulations to protect biological resources during implementation of the project. Also, timber harvests and/or forest management activities are expected to take place on project sites for reasons that are independent of the Forest Protocol, i.e., the sites contain existing or formerly managed forest, because of their property ownership, land use, and/or location, along with market demands for wood products. Consequently, silviculture activities would occur with or without the inclusion of the protocol in the offset program, so a substantial adverse environmental change resulting from forest offset project activities would not be expected.

However, the possibility cannot be ruled out that a special-status species or its habitat could be adversely affected, recognizing the changes in habitat expected from the reforestation projects. Therefore, although the risk of adverse impact to special-status species and their sensitive habitats is small, it cannot be eliminated. Furthermore, special-status species and their sensitive habitats deserve extra care in their protection, because of their scarcity and importance. Therefore, a conservative interpretation (i.e., seeking to avoid a risk of understating impacts) would warrant a conclusion that impacts to special-status species and their sensitive habitats are considered to be potentially significant.

All forest projects are expected to include periodic forest management activities, such as thinning to increase resistance to wildfire, insect or disease risks, or to balance age classes, and timber harvests. The requirement of the Forest Protocol to use sustainable long-term harvesting practices and natural forest management would minimize potential impacts to biological resources over the long-term by broadening the goal of increased carbon sequestration to include goals of managing for diversity of native species, multiple forest age classes to support functioning habitat, and complexity of forest structure. However, short-term impacts to biological resources, such as temporary loss of foraging, nesting, sheltering habitat for special-status wildlife or fill or degradation of wetlands, creeks, or other aquatic habitat, could occur during timber harvesting or other forest management activities.

Forest projects would occur on land that is currently timber land and could be subject to forest management and periodic timber harvesting under existing market conditions, or was formerly subject to forest management and/or timber harvesting. Timber harvests and/or forest management activities are expected to take place on project sites for

reasons that are independent of the Forest Protocol, i.e., the sites contain existing or formerly managed forest, because of their property ownership, land use, and/or location, along with market demands for wood products. Compared to existing timber harvesting and forest management activities on a project site, implementation of the Forest Protocol would not be expected to result in substantial adverse environmental changes related to Forest projects under the Forest Protocol are not expected to interfere substantially with native wildlife or fish movement or impede the use of movement corridors or nursery sites. Forest projects are required by the protocol to use sustainable long-term harvesting practices and natural forest management, which, in general, would promote principles of biodiversity. Existing conservation plans adopted to comply with the Endangered Species Act or similar state laws establish legal constraints for forest management and timber harvest that must be similarly carried out with or without an offset project. Therefore, impacts to wildlife or fish movement, corridors, or nursery sites, and local policies and conservation plans, are considered less than significant.

As explained above, the proposed updated Forest Protocol, specifically the addition of Alaska to the states eligible for forest projects, would not change the reasonably foreseeable compliance responses as evaluated in the 2010 FED. Forest protocol related-activities associated with this update would occur in Alaska in the same manner as was evaluated in the 2010 FED. Therefore, implementation of the proposed updated Forest Protocol would result in the same **potentially significant** impacts on biological resources as evaluated and disclosed in the 2010 FED, as summarized above and incorporated by reference, but extended geographically to Alaska.

ii. Mitigation Measures

The proposed updated Forest Protocol shall implement the same measures as included in the 2010 FED, as summarized below. The following mitigation addresses potentially significant biological impacts resulting from implementation of the proposed updated Forest Protocol:

- Implement adaptive management, as described in Section 2.E of the 2010 FED.

As described in the 2010 FED, while ARB's commitment to adaptive management would reduce the risks of unintended, significant adverse biological impacts from occurring as a result of the implementation of the Forest Protocol, it would not be feasible to entirely eliminate them. Although ARB has certain action responses it can take, if needed, it does not have jurisdiction over implementation of physical actions on project sites that would directly avoid or mitigate biological impacts. ARB is not responsible for implementation of project-specific mitigation and the programmatic analysis did not allow project-specific details of mitigation and thus, there is inherent

uncertainty in the degree of mitigation ultimately implemented to reduce potentially significant impacts. Consequently the 2010 FED took the conservative approach in its post-mitigation significance conclusion (i.e., seeking to avoid a risk of understating potential effects) and discloses, for CEQA compliance purposes, that this impact would be **potentially significant and unavoidable**.

As explained above, the proposed updated Forest Protocol, specifically the addition of Alaska to the states eligible for forest projects, would not change the reasonably foreseeable compliance responses as evaluated in the 2010 FED. Forest protocol related-activities associated with this update would occur in Alaska in the same manner as was evaluated in the 2010 FED. Therefore, implementation of the proposed updated Forest Protocol would also result in the same **significant and unavoidable** biological resources impacts in Alaska.

e. Cultural Resources

i. Impacts Analysis

As described in the 2010 FED, reasonably foreseeable compliance responses associated with implementation of the Forest Protocol were found to result in **less-than-significant** cultural resources impacts (ARB 2010). Thus, no mitigation for cultural resources was identified in the 2010 FED (ARB 2010).

Specifically, as stated in the 2010 FED, the potential for impacts to cultural resources from forest management activities exists under current conditions because lands that could support a forest project were either historically, or are already subject to, forest management and/or potential timber harvest. Timber harvests and/or forest management activities are expected to take place on project sites for reasons that are independent of the Forest Protocol (i.e., the sites contain existing or formerly managed forest) because of their property ownership, land use, and/or location, along with market demands for wood products. Consequently, silviculture activities would occur with or without the Forest Protocol, so a substantial adverse environmental change resulting from forest project activities would not be expected. Development of a forest project would not bring forest management activities to new lands and would not be likely to increase risk of encountering cultural resources. Forest projects would occur on land that was historically forested or currently forested and could be subject to periodic disturbance by forest management activities, such as thinning, hazardous fuel removal, replanting, and timber harvesting under existing conditions.

As explained above, the proposed updated Forest Protocol, specifically the addition of Alaska to the states eligible for forest projects, would not change the reasonably foreseeable compliance responses as evaluated in the 2010 FED. Forest protocol related-activities associated with this update would occur in Alaska in the same manner as was evaluated in the 2010 FED. Therefore, implementation of the proposed updated Forest Protocol would not result in any potential cultural resources impacts in addition to those already evaluated and disclosed in the 2010 FED, as summarized above and incorporated by reference.

ii. Mitigation Measures

Mitigation is not warranted.

f. Energy Demand

i. Impacts Analysis

As described in the 2010 FED, reasonably foreseeable compliance responses associated with implementation of the Forest Protocol were found to result in **less-than-significant** energy demand impacts (ARB 2010). Thus, no mitigation for energy demand was identified in the 2010 FED (ARB 2010).

Specifically, as stated in the 2010 FED, forest projects would occur on land that currently supports or historically supported forests. Forested land is typically subject to periodic forest management activities, such as thinning, hazardous fuel removal, replanting, and/or potentially timber harvest, as determined by land ownership and market conditions. Therefore, timber harvests and forest management would be a part of the baseline of activities on a project site, as determined by factors that are independent of the Forest Protocol (i.e., occurring with or without implementation of the Forest Protocol). The potential for these effects would be present under existing conditions, because land proposed for a forest offset project would already be expected to support forest management and/or timber harvest activities of some type, based on land ownership and market conditions, or was historically subject to forest management and/or timber harvesting. Therefore, substantial differences in energy demand and consumption from current management practices would not be expected.

As explained above, the proposed updated Forest Protocol, specifically the addition of Alaska to the states eligible for forest projects, would not change the reasonably foreseeable compliance responses as evaluated in the 2010 FED. Forest protocol related-activities associated with this update would occur in Alaska in the same manner as was evaluated in the 2010 FED. Therefore, implementation of the proposed updated Forest Protocol would not result in any potential energy demand impacts in addition to

those already evaluated and disclosed in the 2010 FED, as summarized above and incorporated by reference.

ii. Mitigation Measures

Mitigation is not warranted.

g. Geology, Soils, and Minerals

i. Impacts Analysis

As described in the 2010 FED, reasonably foreseeable compliance responses associated with implementation of the Forest Protocol were found to result in **less-than-significant** geology, soils, and minerals impacts (ARB 2010). Thus, no mitigation for geology, soils, and minerals was identified in the 2010 FED (ARB 2010).

Specifically, as stated in the 2010 FED, forest projects would occur on land that currently supports or historically supported forests. Geological risks (i.e., increased risk of rupture of known earthquake fault, strong seismic shaking, ground failure, or landslides), soil erosion or loss of topsoil, unstable soil conditions, mineral resources, soils capable of supporting septic tanks or alternative wastewater disposal would be present under existing conditions because land proposed for a forest project would already be expected to support or previously supported forest management and/or timber harvest activities of some type, based on land ownership and market conditions. The degree of risk would not be substantially different from existing conditions.

As explained above, the proposed updated Forest Protocol, specifically the addition of Alaska to the states eligible for forest projects, would not change the reasonably foreseeable compliance responses as evaluated in the 2010 FED. Forest protocol related-activities associated with this update would occur in Alaska in the same manner as was evaluated in the 2010 FED. Therefore, implementation of the proposed updated Forest Protocol would not result in any potential geology, soils, and minerals impacts in addition to those already evaluated and disclosed in the 2010 FED, as summarized above and incorporated by reference.

ii. Mitigation Measures

Mitigation is not warranted.

h. Greenhouse Gas Emissions

i. Impacts Analysis

As described in the 2010 FED, reasonably foreseeable compliance responses associated with implementation of the Forest Protocol were found to be **beneficial** with regards to GHGs (ARB 2010). Thus, no mitigation for GHGs was identified in the 2010 FED (ARB 2010).

Specifically, as stated in the 2010 FED, forest projects would result in a net reduction in GHG emissions through increased rates of sequestration that outweigh GHG emissions from forestry activities.

As explained above, the proposed updated Forest Protocol, specifically the addition of Alaska to the states eligible for forest projects, would not change the reasonably foreseeable compliance responses as evaluated in the 2010 FED. Forest protocol related-activities associated with this update would occur in Alaska in the same manner as was evaluated in the 2010 FED. Therefore, implementation of the proposed updated Forest Protocol would not result in any potential GHG impacts in addition to those already evaluated and disclosed in the 2010 FED, as summarized above and incorporated by reference.

ii. Mitigation Measures

Mitigation is not warranted.

i. Hazards and Hazardous Materials

i. Impacts Analysis

As described in the 2010 FED, reasonably foreseeable compliance responses associated with implementation of the Forest Protocol were found to result in **less-than-significant** hazards and hazardous materials impacts (ARB 2010). Thus, no mitigation for hazards and hazardous materials was identified in the 2010 FED (ARB 2010).

Specifically, as stated in the 2010 FED, forest projects could conceivably result in a variety of forest management activities that would involve the use of hazardous materials including fuels and lubricants for mobile forestry equipment (e.g., logging trucks, tree saws, tractors, other vehicles) and minor use of household cleaning solvents at base camp operations. Further, forestry operations could create worker hazards, because of the potential hazards of falling trees and use of dangerous equipment (e.g., saws, large tractors). These risks of potential hazard-related consequences would be present under existing conditions, as well, because the land

involved in a forest offset project would be subject to existing or previous forest management and/or timber harvest activities, as determined by independent factors, such as property ownership and market conditions. As a result, the risk of hazards would exist with or without a forest offset project.

Forest projects would be required to secure appropriate permits and/or entitlements from government entities. Projects in California would be required to comply with CEQA and where a federal permit is required, NEPA may be required. (Federal lands are not eligible for forest projects). Through the entitlement process in these areas, necessary approvals for operation would be obtained with consideration of potential environmental effects including hazards and hazardous material impacts. Further, projects using hazardous materials would be required to comply with all appropriate federal, state, and local requirements regulating their use, storage, and transport. In addition, projects would be required to comply with all applicable workplace safety requirements including the Occupational Safety and Health Administration (OSHA) requirements, which typically require the preparation of appropriate safety plans. Finally, forest projects would also be required to implement appropriate emergency response/evacuation plans and wildfire risk reduction plans.

Forest projects would occur on land that currently support or historically supported forests. Forested land is typically subject to periodic forest management activities, such as thinning, hazardous fuel removal, replanting, and/or potentially timber harvest, as determined by land ownership and market conditions. Timber harvests and forest management would, therefore, be a part of the baseline of activities on a project site, as determined by factors that are independent of the Forest Protocol (i.e., occurring with or without implementation of the Forest Protocol). Establishing a forest offset project would not be expected to result in the exercise of forest management activities where they could not already occur or historically may have occurred in some form, based on property ownership and market conditions. Therefore, substantial differences in the use of hazardous materials or risk of encountering other hazards from current management practices would not be expected.

As explained above, the proposed updated Forest Protocol, specifically the addition of Alaska to the states eligible for forest projects, would not change the reasonably foreseeable compliance responses as evaluated in the 2010 FED. Forest protocol related-activities associated with this update would occur in Alaska in the same manner as was evaluated in the 2010 FED. Therefore, implementation of the proposed updated Forest Protocol would not result in any potential hazards and hazardous materials impacts in addition to those already evaluated and disclosed in the 2010 FED, as summarized above and incorporated by reference.

ii. Mitigation Measures

Mitigation is not warranted.

j. Hydrology and Water Quality

i. Impacts Analysis

As described in the 2010 FED, reasonably foreseeable compliance responses associated with implementation of the Forest Protocol were found to result in **less-than-significant** hydrology and water quality impacts (ARB 2010). Thus, no mitigation for hydrology and water quality was identified in the 2010 FED (ARB 2010).

Specifically, as stated in the 2010 FED, forest projects would occur on land that currently supports or historically supported forests. Because land proposed for a forest project would already be expected to support or have previously supported forest management and/or timber harvest activities of some type, based on land ownership and market conditions and that laws and regulations protect water quality in California (i.e., through both state and federal laws) and outside the state (i.e., through federal laws) hydrology and water quality conditions would not be substantially different than current conditions.

As explained above, the proposed updated Forest Protocol, specifically the addition of Alaska to the states eligible for forest projects a, would not change the reasonably foreseeable compliance responses as evaluated in the 2010 FED. Forest protocol related-activities associated with this update would occur in Alaska in the same manner as was evaluated in the 2010 FED. Therefore, implementation of the proposed updated Forest Protocol would not result in any potential hydrology and water quality impacts in addition to those already evaluated and disclosed in the 2010 FED, as summarized above and incorporated by reference.

ii. Mitigation Measures

Mitigation is not warranted.

k. Land Use and Planning

i. Impacts Analysis

As described in the 2010 FED, reasonably foreseeable compliance responses associated with implementation of the Forest Protocol were found to result in **significant and unavoidable** land use and planning impacts (ARB 2010).

All proposed offset projects would be required to secure appropriate permits and/or entitlements from appropriate government entities. Projects in California would be required to comply with CEQA and where a federal permit is required, compliance with NEPA may be necessary. Projects in an area subject to a Habitat Conservation Plan under the federal Endangered Species Act or, in California, a Natural Communities Conservation Plan would be bound by the legal restrictions of those conservation plans. Projects that need approval by local governments would be required to be consistent with any applicable planning document, including the jurisdiction's general plan, any applicable specific plan, and zoning requirements. Therefore, implementation of the Forest Protocol would result in less than significant impacts related to Habitat Conservation Plans and Natural Communities Conservation Plans.

Reforestation projects are expected to primarily occur in open, previously forested areas, rather than within developed communities. Improved forest management projects would occur on existing forest land and would remain as forest land, which is not expected to conflict with land use plans or physically divide communities.

Avoided conversion projects could conflict with local planned land uses. Avoided conversion projects involve preventing the conversion of forestland to a non-forest land use by dedicating the land to continuous forest cover through a conservation easement or transfer to public ownership where forests are at risk of conversion. Specifically, in order to qualify as an avoided conversion project, the private forest owner must demonstrate there is a significant threat of conversion of the project land to a non-forest use. In order to demonstrate that the land is likely to be converted to a non-forest use, the private land owner must provide a real estate appraisal showing that potential non-forest land use would generate substantially higher land value than forest use and at least one of the following forms of documentation that the potential conversion would be legally permissible:

1. Documentation indicating that the current land use policies, including zoning and general plan ordinances, and other local and state statutes and regulations, permit the anticipated type of conversion.

2. Documentation indicating that the Forest Owner has obtained all necessary approvals from the governing county to convert the project area to the proposed type of non-forest land use (including, for instance, certificates of compliance, subdivision approvals, timber conversion permits, other rezoning, major or minor use permits, etc.)

3. Documentation indicating that similarly situated forestlands within the project's assessment area were recently able to obtain all necessary approvals from the governing county, state, or other governing agency to convert to a non-forest

land use (including, for instance, certificates of compliance, subdivision approvals, timber conversion permits, other rezoning, major or minor use permits, etc.)

Because avoided conversion projects could occur on land planned for other, non-forest uses and, if so, would prevent the planned non-forest use from occurring, avoided conversion projects could conflict with local land use plans. This would be a **potentially significant** impact resulting from implementation of the Forest Protocol.

ii. Mitigation Measures

The following mitigation measure (LU-1) applies to the Forest Protocol avoided conversion projects.

Proponents of avoided conversion offset projects under the Forest Protocol will coordinate with local land use agencies to reconcile land use plan and zoning designations and the ongoing undeveloped forest condition of the project area. Local land use agencies will complete appropriate reviews to ensure that the project complies with applicable land use plans and regulations, or where conflicts exist, will implement appropriate land use designation changes so that proposed avoided conversion projects would be compatible with appropriate land use documents and policies. Land use agencies should consider compatible densities and land use types at the edges of the avoided conversion area and the avoided conversion project should conform, to the extent feasible, with applicable land use goals, objectives, and policies.

Because ARB does not have jurisdiction over local land use decisions, it cannot guarantee that the mitigation described above will be implemented. Further, because conflicts with planned future land uses are inherent to avoided conversion projects, impacts of the avoided conversion projects on land use are considered significant and unavoidable, even with implementation of feasible mitigation.

As explained above, the proposed updated Forest Protocol, specifically the addition of Alaska to the states eligible for forest projects, would not change the reasonably foreseeable compliance responses as evaluated in the 2010 FED. Forest protocol related-activities associated with this update would occur in Alaska in the same manner as was evaluated in the 2010 FED. Therefore, implementation of the proposed updated Forest Protocol could result in **potentially significant and unavoidable** impacts to land use and planning as evaluated and disclosed in the 2010 FED, as summarized above and incorporated by reference, but extended geographically to Alaska.

l. Noise

i. Impacts Analysis

As described in the 2010 FED, reasonably foreseeable compliance responses associated with implementation of the Forest Protocol were found to result in **less-than-significant** noise (or vibration) impacts (ARB 2010). Thus, no mitigation for noise (or vibration) was identified in the 2010 FED (ARB 2010).

Specifically, as stated in the 2010 FED, because timber harvest and forest management activities that would generate this potential noise and vibration could take place independent of the Forest Protocol, based on property ownership and market conditions, they would occur with or without inclusion of the Forest Protocol.

As explained above, the proposed updated Forest Protocol, specifically the addition of Alaska to the states eligible for forest projects, would not change the reasonably foreseeable compliance responses as evaluated in the 2010 FED. Forest protocol related-activities associated with this update would occur in Alaska in the same manner as was evaluated in the 2010 FED. Therefore, implementation of the proposed updated Forest Protocol would not result in any potential noise (or vibration) impacts in addition to those already evaluated and disclosed in the 2010 FED, as summarized above and incorporated by reference.

ii. Mitigation Measures

Mitigation is not warranted.

m. Population and Housing

i. Impacts Analysis

As described in the 2010 FED, reasonably foreseeable compliance responses associated with implementation of the Forest Protocol were found to result in **less-than-significant** population and housing impacts (ARB 2010). Thus, no mitigation for population and housing was identified in the 2010 FED (ARB 2010).

Specifically, as stated in the 2010 FED, forest projects could result in a variety of forest management activities that would include the use of workers to plant, trim, cut, harvest, and haul away seedlings/trees in designated areas, use of a variety of mobile forestry equipment (e.g., logging trucks, tree saws, tractors, other vehicles), and potentially establish small base camp type facilities (e.g., mobile office buildings, storage buildings) to oversee the reforestation and forest management activities. It is anticipated that forest projects would result in the creation of limited employment opportunities.

Proposed forest projects would not be concentrated in any one area. Given the anticipated dispersion of project locations and the limited number of new employment opportunities associated with a project, the number of workers migrating to a project area would be minimal, resulting in minor impacts to employment, population, and housing supplies. Therefore, it is expected that forest project impacts related to employment, population, and housing supplies from implementation of the Forest Protocol would be less than significant.

As explained above, the proposed updated Forest Protocol, specifically the addition of Alaska to the states eligible for forest projects, would not change the reasonably foreseeable compliance responses as evaluated in the 2010 FED. Forest protocol related-activities associated with this update would occur in Alaska in the same manner as was evaluated in the 2010 FED. Therefore, implementation of the proposed updated Forest Protocol would not result in any potential population and housing impacts in addition to those already evaluated and disclosed in the 2010 FED, as summarized above and incorporated by reference.

ii. Mitigation Measures

Mitigation is not warranted.

n. Public Services

i. Impacts Analysis

As described in the 2010 FED, reasonably foreseeable compliance responses associated with implementation of the Forest Protocol were found to result in **less-than-significant** public services impacts (ARB 2010). Thus, no mitigation for public services was identified in the 2010 FED (ARB 2010).

Specifically, as stated in the 2010 FED, projects in California would be required to comply with CEQA and where a federal permit is required, NEPA compliance may be necessary. Through the entitlement process in these areas, necessary approvals for public services would be obtained with consideration of potential environmental effects. Timber harvests and/or forest management activities are expected to take place on project sites for reasons that are independent of the Forest Protocol because of their property ownership, land use, and/or location, along with market demands for wood products. Consequently, silviculture activities would occur with or without the inclusion of the protocol in the offset program, so a substantial adverse environmental change resulting from forest offset project activities would not be expected.

As explained above, the proposed updated Forest Protocol, specifically the addition of Alaska to the states eligible for forest projects, would not change the reasonably foreseeable compliance responses as evaluated in the 2010 FED. Forest protocol related-activities associated with this update would occur in Alaska in the same manner as was evaluated in the 2010 FED. Therefore, implementation of the proposed updated Forest Protocol would not result in any potential public services impacts in addition to those already evaluated and disclosed in the 2010 FED, as summarized above and incorporated by reference.

ii. Mitigation Measures

Mitigation is not warranted.

o. Recreation

i. Impacts Analysis

As described in the 2010 FED, reasonably foreseeable compliance responses associated with implementation of the Forest Protocol were found to result in **less-than-significant** recreation impacts (ARB 2010). Thus, no mitigation for recreation was identified in the 2010 FED (ARB 2010).

Specifically, as stated in the 2010 FED, forest projects could result in enhancement to recreational areas by improving, expanding, or creating new forests in recreational areas. These offset projects would involve tree restoration and/or forest management and maintenance activities.

Forest projects could involve the construction of roads, temporary and/or permanent area closures for tree installation or forest management/maintenance activities, and periodic increases in truck and/or construction equipment traffic. For offset projects located in established recreation areas, these activities could directly or indirectly disrupt recreational activities. However, the potential for these impacts to recreation from forest management activities exists under current conditions, and is not likely to increase as a result of implementation of the Forest Protocol. Forest projects would occur on land that was historically forested or subject to forest management, or is currently forested and could be subject to periodic forest management activities, such as thinning, hazardous fuel removal, replanting, and timber harvesting, under existing land ownership and market conditions. Timber harvests and/or forest management activities are expected to take place on project sites for reasons that are independent of the Forest Protocol because of their property ownership, land use, and/or location, along with market demands for wood products. Consequently, silviculture activities would occur with or without the inclusion of the protocol in the offset program, so a

substantial adverse environmental change resulting from forest offset project activities would not be expected.

As explained above, the proposed updated Forest Protocol, specifically the addition of Alaska to the states eligible for forest projects, would not change the reasonably foreseeable compliance responses as evaluated in the 2010 FED. Forest protocol related-activities associated with this update would occur in Alaska in the same manner as was evaluated in the 2010 FED. Therefore, implementation of the proposed updated Forest Protocol would not result in any potential recreation impacts in addition to those already evaluated and disclosed in the 2010 FED, as summarized above and incorporated by reference.

ii. Mitigation Measures

Mitigation is not warranted.

p. Transportation and Traffic

i. Impacts Analysis

As described in the 2010 FED, reasonably foreseeable compliance responses associated with implementation of the Forest Protocol were found to result in **less-than-significant** transportation and traffic impacts (ARB 2010). Thus, no mitigation for transportation and traffic was identified in the 2010 FED (ARB 2010).

Specifically, as stated in the 2010 FED, the potential for impacts to transportation and traffic from forest management activities exists under current conditions, and is not likely to increase as a result of implementation of the Forest Protocol. Forest projects would occur on land that was historically forested or subject to forest management, or is currently forested and could be subject to periodic forest management activities, such as thinning, hazardous fuel removal, replanting, and timber harvesting, under existing land ownership and market conditions. Timber harvests and/or forest management activities are expected to take place on project sites for reasons that are independent of the Forest Protocol, i.e., the sites contain existing or formerly managed forest, because of their property ownership, land use, and/or location, along with market demands for wood products. Consequently, silviculture activities would occur with or without the inclusion of the protocol in the offset program, so a substantial adverse environmental change resulting from forest offset project activities would not be expected.

As explained above, the proposed updated Forest Protocol, specifically the addition of Alaska to the states eligible for forest projects, would not change the reasonably foreseeable compliance responses as evaluated in the 2010 FED. Forest protocol

related-activities associated with this update would occur in Alaska in the same manner as was evaluated in the 2010 FED. Therefore, implementation of the proposed updated Forest Protocol would not result in any potential transportation and traffic impacts in addition to those already evaluated and disclosed in the 2010 FED, as summarized above and incorporated by reference.

ii. Mitigation Measures

Mitigation is not warranted.

q. Utilities and Service Systems

i. Impacts Analysis

As described in the 2010 FED, reasonably foreseeable compliance responses associated with implementation of the Forest Protocol were found to result in **less-than-significant** utilities and service systems impacts (ARB 2010). Thus, no mitigation for utilities and service systems was identified in the 2010 FED (ARB 2010).

Specifically, as stated in the 2010 FED, forest projects could potentially include the establishment of small base camp type facilities (e.g., mobile building) that would connect to electricity and other services (e.g., wastewater, water, and solid waste services) to oversee the forest management activities. The base-camp facilities would be small and because of their remote location and the likelihood that projects would not be concentrated in any one locations, these programs would not be anticipated to result in a substantial demand for utilities and service systems (e.g., solid waste facilities capacity, electricity, natural gas, wastewater services, water demand and supply services, wastewater treatment requirements, and solid waste regulations) above and beyond what could be provided by existing service providers and resources.

As explained above, the proposed updated Forest Protocol, specifically the addition of Alaska to the states eligible for forest projects, would not change the reasonably foreseeable compliance responses as evaluated in the 2010 FED. Forest protocol related-activities associated with this update would occur in Alaska in the same manner as was evaluated in the 2010 FED. Therefore, implementation of the proposed updated Forest Protocol would not result in any potential utilities and service systems impacts in addition to those already evaluated and disclosed in the 2010 FED, as summarized above and incorporated by reference.

ii. Mitigation Measures

Mitigation is not warranted.

r. Summary of Impacts and Mitigation Measures

i. Summary Impact Matrix for the Proposed Updated Forest Protocol

Table 1. Summary Impact Matrix for the Proposed Updated Forest Protocol EA			
Resource Area	**Significance Before Mitigation**	**Potential Mitigation**	**Significance After Mitigation**
Aesthetics			
	Less than significant	Mitigation is not warranted	Not Applicable
Agriculture Resources			
	Less than significant	Mitigation is not warranted	Not Applicable
Air Quality			
	Less than significant	Mitigation is not warranted	Not Applicable
Biological Resources			
	Significant	Adaptive Mgt. Mitigation Measure 2E. from 2010 FED	Significant and Unavoidable
Cultural Resources			
	Less than significant	Mitigation is not warranted	Not Applicable
Energy Demand			
	Less than significant	Mitigation is not warranted	Not Applicable
Geology, Soils and Minerals			
	Less than significant	Mitigation is not warranted	Not Applicable
Greenhouse Gas Emissions			
	Beneficial	Mitigation is not warranted	Not Applicable
Hazards and Hazardous Materials			
	Less than significant	Mitigation is not warranted	Not Applicable
Hydrology and Water Quality			
	Less than significant	Mitigation is not warranted	Not Applicable

Table 1. Summary Impact Matrix for the Proposed Updated Forest Protocol EA			
Resource Area	**Significance Before Mitigation**	**Potential Mitigation**	**Significance After Mitigation**
Land Use and Planning			
	Significant	Mitigation Measure (LU-1) from 2010 FED	Significant and Unavoidable
Noise			
	Less than significant	Mitigation is not warranted	Not Applicable
Population and Housing			
	Less than significant	Mitigation is not warranted	Not Applicable
Public Services			
	Less than significant	Mitigation is not warranted	Not Applicable
Recreation			
	Less than significant	Mitigation is not warranted	Not Applicable
Transportation and Traffic			
	Less than significant	Mitigation is not warranted	Not Applicable
Utilities and Service Systems			
	Less than significant	Mitigation is not warranted	Not Applicable

4. Mandatory Findings of Significance

Consistent with the requirements of the California Environmental Quality Act (CEQA) Guidelines section 15065 and section 18 of the Environmental Checklist, this supplemental EA addresses the mandatory findings of significance for the proposed updated Forest Protocol.

Consistent with the requirements of the CEQA Guidelines, Appendix G, Environmental Checklist, Section 18, the 2010 FED addressed the mandatory findings of significance as discussed below. The 2010 FED also included discussions on significant and unavoidable environmental effects and significant and irreversible environmental changes. 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. Outside of California, other federal, 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.

The 2010 FED, in its entirety, addressed and disclosed potential environmental effects associated with implementation of the Cap-and-Trade Regulation, including the Forest Protocol. As described in the impact analyses for the 2010 FED, as well as in this supplemental EA for the proposed updated Forest Protocol, potential environmental impacts, the level of significance prior to mitigation, mitigation measures, and the level of significance after the incorporation of mitigation measures are disclosed.

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?

As stated in the 2010 FED, under Section 15065(a) of the CEQA Guidelines, a finding of significance is required if a project “has the potential to substantially degrade the quality of the environment.” In practice, this is the same standard as a significant effect on the environment, which is defined in Section 15382 of the CEQA Guidelines 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.” 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. 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 2010 FED, in its entirety, addresses and discloses potential environmental effects associated with implementation of the Cap-and-Trade Regulation, which included the Forest Protocol, in the following resource areas:

- Aesthetics
- Agriculture and Forest Resources
- Air Quality
- Biological Resources
- Cultural Resources
- Energy Demand
- Geology, Soils, and Mineral
- Greenhouse Gases
- Hazards and Hazardous Materials
- Hydrology and Water Quality
- Land Use and Planning
- Noise
- Employment, Population and Housing
- Public Services
- Recreation
- Transportation and Traffic
- Utilities and Service Systems

Chapter 4, “Impact Analysis,” of the 2010 FED discloses potential environmental impacts, the level of significance prior to mitigation, mitigation measures, and the level of significance after the incorporation of mitigation measures. Section “Impacts and Mitigation” of this supplemental EA addresses these for the proposed updated Forest Protocol.

The discussion above as it relates to the Cap-and-Trade Regulation includes the Forest Protocol. Based on ARB’s review, staff has determined that implementation of the proposed updated Forest Protocol would not result in any new potentially significant adverse impacts on the physical environment that were not already addressed in the 2010 FED.

a. Impacts on Species

As stated in the 2010 FED, under Section 15065(a)(1) of the CEQA Guidelines, 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 (1) substantially reduce the habitat of a fish or wildlife species; (2) cause a fish or wildlife population to drop below self-sustaining levels; or (3) substantially reduce the number or restrict the range of an endangered, rare, or threatened species. Chapter 4, “Biological Resources,” of

the 2010 FED addresses impacts related to the reduction of the fish or wildlife habitat, the reduction of fish or wildlife populations, and the reduction or restriction of the range of special-status species. Potential impacts were evaluated primarily on the basis of review of pertinent literature, review of relevant reports pertaining to specific resources, and review of available databases documenting species and habitat occurrences.

The impacts and mitigation section of this supplemental EA addresses impacts that could occur to biological resources associated with the proposed updated Forest Protocol. As described above, habitat conditions would change with implementation of reforestation projects, including removal of existing and planting of new vegetation. Wildlife species occupying the existing habitat on reforestation project lands could be disturbed and/or displaced to nearby suitable habitat as a result of the reforestation project activities and habitat changes, and wildlife could be lost. Short-term impacts to biological resources, such as temporary loss of foraging, nesting, sheltering habitat for special-status wildlife or fill or degradation of wetlands, creeks, or other aquatic habitat, could occur during timber harvesting or other forest management activities. Habitat changes and wildlife disruption resulting from implementation of reforestation projects could have a potentially significant impact on biological resources.

In addition, although the risk of adverse impact to special-status species and their sensitive habitats is small, it cannot be eliminated. Special-status species and their sensitive habitats deserve extra care in their protection, because of their scarcity and importance. Therefore, a conservative interpretation (i.e., seeking to avoid a risk of understating potential effects) would warrant a conclusion that impacts to special-status species and their sensitive habitats are considered to be potentially significant.

b. Impacts on Historical Resources

As stated in the 2010 FED, under Section 15065(a)(1) of the CEQA Guidelines 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 eliminate important examples of a major period of California history or prehistory. Section 15065(a)(1) amplifies Public Resources Code (PRC) Section 21001(c) requiring that major periods of California history are preserved for future generations. It also reflects the provisions of PRC Section 21084.1 requiring a finding of significance for substantial adverse changes to historical resources. Section 15064.5 of the CEQA Guidelines establishes standards for determining the significance of impacts to historical resources and archaeological sites that are a historical resource. Chapter 4, “Cultural Resources,” of the 2010 FED addresses impacts related to California history and prehistory, historic resources, archaeological resources, and paleontological resources.

In general, the types of historical resources likely to be affected by new development includes prehistoric and historical archaeological sites such as prehistoric habitation sites, lithic tool and debris scatters, bedrock milling stations, quarries, rock art, historical refuse scatters, mining pits, ranching and agricultural artifact scatters or structural ruins, native plant gathering areas, traditional cultural properties, and sacred sites.

The number of potential future compliance responses and offset projects cannot be known and will depend upon myriad economic, political, and environmental factors. The analysis presented in the 2010 FED provides a reasonable characterization of the way in which the future could unfold; analysis of additional potential future scenarios would not meaningfully add to the body of evidence necessary for ARB to make an informed decision with regard to the proposed regulation.

In addition, 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 size, 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.

The Cap-and-Trade Regulation may have the potential to degrade the quality of the environment relating to fish or wildlife species. There are many laws and regulations and best practices currently in place, that when adhered to and location-specific mitigation is implemented, would largely reduce these impacts to a level of insignificance. However, because ARB does not have the authority to require implementation of project-specific mitigation, there is inherent uncertainty in the degree of mitigation ultimately implemented to reduce the potentially significant impacts. Therefore, ARB found the Cap-and-Trade Regulation to potentially result in adverse impacts to biological, cultural, historical resources.

The impacts and mitigation section of this supplemental EA addresses impacts that could occur to cultural resources associated with the proposed updated Forest Protocol. The potential for impacts to cultural resources from forest management activities exists under current conditions because lands that could support a forest project were either previously forest and subject to forest management activities or are currently subject to forest management and/or potential timber harvest, based on land ownership and market conditions. Thus, the proposed updated Forest Protocol would not eliminate important examples of the major periods of California history or prehistory.

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

As required by Section 15065 of the CEQA Guidelines, 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. As defined in Section 15065(a)(3) of the CEQA Guidelines, 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." Cumulative impacts are addressed for each of the environmental topics listed above and are provided in Chapter 4, "Cumulative and Growth Inducting Impacts," of the 2010 FED. The analysis depicts that the Cap-and-Trade Regulation may present potentially cumulative impacts to the following resource areas:

- Biological
- Cultural
- Geology, Soils, and Minerals
- Hydrology, Water Quality and Water Supply

The following section in this supplemental EA discusses cumulative impacts in relation to the proposed updated Forest Protocol.

The discussion above as relates to the Cap-and-Trade Regulation includes the Forest Protocol. Based on ARB's review, staff has determined that implementation of the proposed updated Forest Protocol would not result in any new potentially significant adverse impacts on the physical environment that were not already addressed in the 2010 FED.

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

As stated in the 2010 FED, consistent with Section 15065(a)(4) of the CEQA Guidelines, 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. 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 the 2010 FED.

The Cap-and-Trade Regulation would not cause substantial adverse effects on human beings, either directly or indirectly. The Cap-and-Trade Regulation is one of the many measures in the Scoping Plan that result in overall improvement of air quality and public health in California.

The discussion above as it relates to the Cap-and-Trade Regulation includes the Forest Protocol. Based on ARB's review, staff has determined that implementation of the proposed updated Forest Protocol would not result in any new potentially significant adverse impacts on the physical environment that were not already addressed in the 2010 FED.

D. Cumulative and Growth-Inducing Impacts

The 2010 FED disclosed cumulative impacts for resource topics in general qualitative terms, recognizing its programmatic nature, as they pertain to reasonably foreseeable development. The cumulative impacts are required to be addressed when the cumulative impacts are expected to be significant and when the project's incremental contribution to the effect is cumulatively considerable. Where a lead agency is examining a project with an incremental effect that is not "cumulatively considerable," a lead agency need not consider that effect significant, but must briefly describe its basis for concluding that the incremental effect is not cumulatively considerable. ARB considered in the 2010 FED the cumulative impacts analysis of other projects that, like the Cap-and-Trade Regulation, are designed to reduce annual emissions of GHGs, and not simply every project that emits GHGs. This approach is "guided by the standards of practicality and reasonableness" and serves the purposes of the cumulative impacts analysis, which is to provide "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).

The level of detail in the cumulative and growth-inducing impacts discussion in the 2010 FED was guided by what is practical and reasonable, and contained the following elements (ARB 2010):

- An analysis of related future projects or planned development that would affect resources in the project area similar to those affected by the proposed project.
- A summary of the expected environmental effects to be produced by those projects with specific reference to additional information stating where that information is available.

- A reasonable analysis of the cumulative impacts of the relevant projects. An environmental document must examine reasonable feasible options for mitigating or avoiding the project's contribution to any significant cumulative effects.

Due to the geographic reach of California's Cap-and-Trade Regulation and, consequently, also the reach of the proposed updated Forest Protocol and the programmatic nature of the environmental assessment, the impact analysis is inherently cumulative in nature, rather than site- or project-specific. As a result, the character of impact conclusions in the resource-oriented impact analysis discussions are cumulative, considering the potential effects of the full range of reasonably foreseeable methods of compliance, along with expected background growth, as appropriate.

For purposes of the cumulative analysis contained in the 2010 FED, impacts were based on the program's contribution to environmental impacts in combination with the environmental effects of the ongoing, adopted, and reasonably foreseeable Scoping Plan measures, and the State Implementation Plan (SIP), which includes goods movement measures (heavy-duty vehicle efficiency, ship electrification, port drayage truck measures, and vessel speed reduction).

The cumulative impact analysis determined the combined effect of the Cap-and-Trade Regulation and other closely related, reasonably foreseeable projects. The discussion of cumulative impacts need not provide as much detail as the discussion of effects attributable to the program alone. The level of detail in the 2010 FED was guided by what was practical and reasonable.

As disclosed in the 2010 FED, implementation of California's Cap-and-Trade Regulation (which assumed the implementation of new offset protocols in addition to what was analyzed in the 2010 FED) was determined to potentially result in cumulatively considerable impacts. While suggested mitigation was provided for each potentially cumulatively considerable impact, the mitigation would need to be implemented by other agencies. Where impacts could not be feasibly mitigated, the 2010 FED recognized the impact as significant and unavoidable. The Board adopted Findings and a Statement of Overriding Considerations.

Because the environmental effects of the proposed updated Forest Protocol are similar to the effects analyzed in the 2010 FED, implementation of the proposed updated Forest Protocol could involve considerable contributions to cumulative impacts that were previously analyzed in the 2010 FED. To the extent that the proposed updated Forest Protocol would result in considerable contributions to cumulative effects, any potential cumulative impacts were addressed in the 2010 FED as part of the overall Cap-and-Trade Regulation.

E. Alternatives Analysis

This section provides an overview of the regulatory requirements and guidance for alternatives analyses under CEQA, a description of each of the alternatives to the proposed project (i.e., the proposed updated Forest Protocol), a discussion of whether and how each alternative meets the project's objectives, and an analysis of each alternative's environmental impacts.

1. Approach to Alternatives Analysis

ARB's certified regulatory program requires that where a contemplated action may have a significant effect on the environment, a staff report shall be prepared in a manner consistent with the environmental protection purposes of ARB's regulatory program and with the goals and policies of CEQA. Among other things, the staff reports must address feasible alternatives to the proposed action that would substantially reduce any significant adverse impact identified.

The regulation 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 which would substantially reduce such adverse impact. 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 state board's legislatively mandated responsibilities and duties (17 CCR 60006).

While ARB, by virtue of its certified program, is exempt from Chapters 3 and 4 of CEQA and corresponding sections of the State CEQA Guidelines, the Guidelines nevertheless contain useful information for preparation of a thorough and meaningful alternatives analysis. The CEQA Guidelines (14 CCR 15126.6(a)) 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 a 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 regulatory requirements.

Alternatives considered in an environmental document should be potentially feasible and should attain most of the basic project objectives. It is, therefore, critical that the alternatives analysis define the project's objectives. In this case, the objectives are established by AB 32. The project objectives are described further below.

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

2. Project Objectives

The primary objectives of offset protocols in the Cap-and-Trade Regulation that are applicable to the proposed updated Forest Protocol include the following:

a) Ensure Program Cost Effectiveness. AB 32 states that the Board shall adopt rules and regulations to achieve the maximum technologically feasible and cost-effective GHG emission reductions in furtherance of meeting the State's GHG reduction goals. Offsets serve to broaden the compliance instrument market to provide greater flexibility to California businesses by offering a wider range of emissions reduction opportunities and greater market liquidity.

b) Encourage Technological Innovation and Reductions from Non-Capped Sectors. Offsets encourage reductions (beyond common business practice and what is required by regulation) from non-capped sources. Offsets support the development of innovative projects and technologies from sources outside capped sectors that can play a key role in reducing emissions both inside and outside California.

c) Decrease GHG Emissions. Offsets decrease GHG emissions in order to achieve the AB 32 mandate.

d) Maximize Environmental Benefits. Offsets maximize the environmental benefits for California.

3. Description of Alternatives

This section evaluates a reasonable range of alternatives to the proposed updated Forest Protocol that could reduce or eliminate the project's significant effects on the environment, while meeting most of the basic project objectives. Pursuant to ARB's certified regulatory program, this section also contains an analysis of each alternative's feasibility and the likelihood that it will substantially reduce any significant adverse

environmental impacts identified in the “Impacts and Mitigation” analysis contained in this supplemental EA (17 CCR 60005(b), 60006).

ARB has identified a reasonable range of three alternatives that allow the public and Board to understand the differences between different approaches. Detailed descriptions of each alternative are presented below. The analysis that follows the descriptions of the alternatives includes a discussion of the degree to which each alternative meets the basic project objectives, and the degree to which each alternative avoids potentially significant impacts identified in “Impacts and Mitigation” section.

a. Alternative 1: No-Project Alternative

i. Description of the Alternative

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 proposed updated Forest Protocol. ARB’s certified regulatory program does not mandate consideration of a “No-Project Alternative” (17 CCR 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” (17 CCR 60006).

Under the No Project Alternative, the amendment to extend the Protocol to Alaska would not occur. Thus, offsets could only be credited from projects in the contiguous U.S. and the protocol would not extend to Alaska. The existing Forest Protocol would continue, allowing offset credits for reforestation, improved forest management, and forest protection (avoided conversion) projects.

ii. Consistency with Project Objectives

The No Project Alternative would meet the project objectives listed in Chapter I, Section C but not to the fullest extent.

Under the No Project Alternative, ARB would continue to implement the Forest Protocol. Offset credits could be obtained in the contiguous U.S., but not Alaska. The ability to meet objectives associated with technological innovation is not expected to substantially change. ARB would continue to achieve significant GHG reductions through the implementation of ongoing, adopted, and reasonably foreseeable measures associated with the existing Forest Protocol; however, its reductions would be less, and at a slower rate, without inclusion of Alaska. This alternative would result in fewer ARBOCs being issued under the protocol. Because issuance of ARBOCs would still occur for projects located in the contiguous U.S., this alternative would be consistent with the stated primary objectives of the project but would not fulfill those objectives to the fullest

extent. Continuing to exclude Alaska would result in a reduced supply of offsets available, thereby diminishing an opportunity to ensure cost-effectiveness in the cap-and-trade program. Therefore, while this alternative is conceptually feasible, the primary objectives would not be fully realized.

iii. Environmental Impacts

There would be no new environmental impacts under the No Action Alternative because compliance responses would not be extended to Alaska. As described in the 2010 FED (ARB 2010), there would be significant and unavoidable impacts on biological resources under the reforestation compliance responses; and significant and unavoidable impacts to land use and planning under the forest protection compliance responses. Because the protocol would be limited to the contiguous U.S., these impacts could not occur in Alaska; thus, the No Project Alternative would result in lesser impacts than under the Proposed Amendments.

b. Extension of Improved Forest Management and Avoided Conversion to Alaska Alternative

i. Description of the Alternative

This alternative would allow for extension of the Forest Protocol to Alaska, but only would allow improved forest management and avoided conversion compliance responses to be used to obtain offset credits in Alaska. Reforestation, improved forest management, and avoided conversion could still be implemented to obtain offset credits in the contiguous U.S.

ii. Consistency with Project Objectives

The Extension of Improved Forest Management and Avoided Conversion to Alaska Alternative would meet the project objectives listed in Chapter I, Section C but not to the fullest extent.

Under the Extension of Improved Forest Management and Avoided Conversion to Alaska Alternative, the Forest Protocol would be implemented in both the contiguous U.S. and Alaska. However, offset credits could not be obtained in Alaska for reforestation compliance responses. The ability to meet objectives associated with technological innovation is not expected to substantially change. ARB would continue to achieve significant GHG reductions through the implementation of ongoing, adopted, and reasonably foreseeable measure associated with the existing Forest Protocol; however, its reductions would be less, and at a slower rate, without allowance of reforestation compliance responses in Alaska. This alternative would result in fewer

ARBOCs being issued under the protocol. Because issuance of ARBOCs would still occur for improved forest management and avoided conversion projects, this alternative would be consistent with the stated primary objectives of the project but would not fulfill those objectives to the fullest extent. Excluding reforestation projects narrows the range of potential activities, resulting in a reduced supply of offsets available and therefore a lower potential for program cost effectiveness in the cap-and-trade program. Therefore, while this alternative is conceptually feasible, the primary objectives would not be fully realized.

iii. Environmental Impacts

Under the Extension of Improved Forest Management and Avoided Conversion to Alaska Alternative, the Forest Protocol would be implemented in both the contiguous U.S. and Alaska. However, offset credits could not be obtained in Alaska for reforestation compliance responses. By not allowing reforestation compliance responses in Alaska, there would be no significant and unavoidable impacts associated with biological resources. Land use and planning impacts would be the same as under the proposed Protocol Amendments. Thus, there would be less environmental impacts under this alternative.

c. Extension of Reforestation and Improved Forest Management to Alaska Alternative

i. Description of the Alternative

This alternative would allow for extension of the Forest Protocol to Alaska, but only would allow reforestation and improved forest management compliance responses to be used to obtain offset credits in Alaska. Reforestation, improved forest management, and avoided conversion could still be implemented to obtain offset credits in the contiguous U.S.

ii. Consistency with Project Objectives

The Extension of Reforestation and Improved Forest Management to Alaska Alternative would meet the project objectives listed in Chapter I, Section C but not to the fullest extent.

Under the Extension of Reforestation and Improved Forest Management to Alaska Alternative, the Forest Protocol would be implemented in the contiguous U.S. and Alaska. However, offset credits could not be obtained in Alaska for avoided conversion compliance responses. The ability to meet objectives associated with technological innovation is not expected to substantially change. ARB would continue to achieve

significant GHG reductions through the implementation of ongoing, adopted, and reasonably foreseeable measure associated with the existing Forest Protocol; however, it reductions would be less, and at a much slower rate, without allowance of avoided conversion compliance responses in Alaska. This alternative would result in fewer ARBOCs being issued under the protocol. Because issuance of ARBOCs would still occur for improved forest management and reforestation projects, this alternative would be consistent with the stated primary objectives of the project but would not fulfill those objectives to the fullest extent. Excluding reforestation projects narrows the range of potential activities, resulting in a reduced supply of offsets available and therefore a lower potential for program cost effectiveness in the cap-and-trade program. Therefore, while this alternative is conceptually feasible, the primary objectives would not be fully realized.

iii. Environmental Impacts

Under the Extension of Improved Forest Management and Avoided Conversion to Alaska Alternative, the Forest Protocol would be implemented in both the contiguous U.S. and Alaska. However, offset credits could not be obtained in Alaska for avoided conversion compliance responses. By not allowing avoided conversion compliance responses in Alaska, there would be no significant and unavoidable impacts associated with land use and planning. Biological resources impacts would be the same as under the proposed Protocol Amendments. Thus, there would be less environmental impacts under this alternative.

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