ESTES TO FLATIRON TRANSMISSION LINES REBUILD PROJECT
LARIMER COUNTY, COLORADO

Final Environmental Impact Statement (DOE/EIS-0483)

March 2018

Western Area Power Administration

Mission Statement

Western is a Federal agency under the Department of Energy that markets and transmits wholesale electrical power through an integrated 17,000-circuit mile, high-voltage transmission system across 15 western states. Western's mission: Market and deliver clean, renewable, reliable, cost-based Federal hydroelectric power and related services. Current vision: Continue to provide premier power marketing and transmission services to our customers as well as contribute to enhancing America's energy security and sustaining our nation's economic vitality.

Department of Energy
Western Area Power Administration
Rocky Mountain Customer Service Region
P.O. Box 3700
Loveland, CO 80539-3003

MAR 26 2018

In Reply Refer To:
DOE/EIS-0483

Dear Reader:

Enclosed for your review is the Final Environmental Impact Statement (EIS) for the Western Area Power Administration (WAPA) Estes to Flatiron Transmission Lines Rebuild Project (Project). The Final EIS informs the public and interested parties of potential environmental impacts associated with implementing each route alternative. This Final EIS has been prepared by WAPA following the National Environmental Policy Act (NEPA) of 1969, as amended, (42 U.S.C. §§ 4321-4347); the Council on Environmental Quality regulations for implementing the procedural provisions of NEPA (40 CFR Parts 1500-1508); and the U.S. Department of Energy (DOE) and United States Forest Service (USFS) NEPA procedures (10 CFR Parts 1021 and 1022, and 36 CFR Part 220, respectively).

Project Background

WAPA currently owns, operates, and maintains two 115-kilovolt (kV) single-circuit transmission lines, dating from 1938 and 1953, which connect Estes Park to the Flatiron Substation in Larimer County, Colorado. The Project would remove both existing 115-kV single-circuit transmission lines and wood structures between Flatiron Substation and the intersection of Mall Road and U.S. Highway 36 in Estes Park and replace them with one of the following options: 1) one double-circuit 115-kV transmission line on steel monopoles within a single right-of-way (ROW), 2) a new double-circuit 115-kV transmission line on steel monopoles within a single ROW with the western portion buried in concrete cable trenches for about 2.6 miles, 3) rebuild of both lines as single-circuit transmission lines on wood-pole H-frame structures on separate ROWs, or 4) the No Action Alternative, which would keep the existing lines in place and continue established maintenance activities.

The proposed Project extends between Lake Estes on the east side of Estes Park and WAPA's Flatiron Substation. The Project area analyzed in the Final EIS encompasses lands east of the Town of Estes Park and west of the City of Loveland, and includes both private lands in Larimer County and public lands administered by the U.S. Department of Interior Bureau of Reclamation, USFS, the Colorado State Land Board, Northern Colorado Water Conservancy District, and Larimer County. Major transportation corridors are U.S. Highways 34 and 36.

The proposed route alternatives would improve access to the transmission lines and widen the ROWs where existing ROWs are inadequate for public and line crew safety and reliable power delivery. They would also implement an integrated vegetation management approach within the ROWs to reduce the risk of trees and other vegetation damaging or interfering with the transmission line and power delivery to Estes Park, Loveland, and nearby Front Range communities. WAPA is the lead Federal agency for the EIS. The USFS, a cooperating agency for the EIS, has jurisdiction over National Forest System lands crossed by the transmission lines and will be making its own decision based on this EIS.

Agency Preferred Alternative

In the Final EIS, WAPA has identified the Agency Preferred Alternative (APA) from seven possible route alternatives and the No Action Alternative. The APA would consist of a new double-circuit line on a consolidated ROW using a portion of two alternatives to respond to local conditions in the west and the east portions of the line. Under the APA, the four-wheel drive portion of West Pole Hill Road would not be reconstructed or improved on National Forest System land, retaining the challenge for four-wheel drive use.

Additionally, special design measures would be considered for the segment within the Meadowdale Hills subdivision, including the use of structures with a lower height and shorter span, if they provide a lower visual impact. On abandoned ROW, existing structures would be removed and the ROW allowed to return to natural vegetation patterns.

The APA identified in the Final EIS was created based on the analysis in the Draft EIS and resulting public and agency input on that analysis. It meets the agencies' respective purpose and needs while balancing federal land management multiple-use mandates and public considerations.

Final EIS Availability

The publication of the Notice of Availability (NOA) in the *Federal Register* by the U.S. Environmental Protection Agency begins WAPA's required 30-day waiting period before making a decision on the Project. Publication of the USFS Draft Record of Decision (ROD) begins their 45-day objection period.

The Estes to Flatiron Transmission Lines Rebuild Project Final EIS and other Project documents are available on the Website at: https://www.wapa.gov/transmission/EnvironmentalReviewNEPA/Pages/estes-flatiron.aspx.

Locations of hard copies will be listed on the Project Website. Should you have any questions, please contact Mark Wieringa, Western Area Power Administration, NEPA Document

Manager, at (720) 962-7448. Any questions or concerns regarding this Final EIS may be addressed to:

E-mail: RMR_estesflatironeis@wapa.gov;
Fax: (720) 962-7269; or
Mail:

Mark Wieringa
Western Area Power Administration, A7400
P.O. Box 281213
Lakewood, CO 80228-8213

The USFS will issue its own ROD in which it will describe its agency-specific decision and objection process.

Sincerely,

Michael D. McElhany
Senior Vice President
Rocky Mountain Regional Manager

Enclosure

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Estes to Flatiron Transmission Lines Rebuild Project, Larimer County, Colorado, DOE/EIS-0483

Final Environmental Impact Statement

Responsible Agencies

Lead Federal Agency:
U.S. Department of Energy, Western Area Power Administration

Cooperating Federal Agencies:
U.S. Department of Agriculture, Forest Service

Abstract

The Western Area Power Administration (Western) currently owns, operates, and maintains two 115-kilovolt (kV) single-circuit transmission lines that connect Estes Park to the Flatiron Substation in Larimer County, Colorado. Western is proposing to rebuild the existing 115-kV system between Flatiron Substation and the intersection of Mall Road and U.S. Highway 36 in Estes Park. The Project would remove the existing 115-kV single-circuit transmission lines and wood structures and replace them with: 1) a new double-circuit 115-kV transmission line on steel monopoles within a single right-of-way (ROW), potentially using a combination of two existing ROWs; 2) a new double-circuit 115-kV transmission line on steel monopoles within a single ROW with the western portion buried in concrete cable trenches for about 2.6 miles; 3) both lines rebuilt as single-circuit transmission lines on wood-pole H-frame structures on separate ROWs, or 4) the No Action Alternative, which would keep the existing lines in place and continue established maintenance activities. The Project would improve access to the transmission lines, widen the ROWs where existing ROW is inadequate, and implement an integrated vegetation management approach within the ROWs to ensure electrical clearance requirements are met and maintained for the life of the Project. Western is the lead Federal agency for the Environmental Impact Statement (EIS). The U.S. Forest Service has jurisdiction over National Forest System lands crossed by the transmission lines, and is a cooperating agency for the EIS.

In the Final EIS, Western identified the Agency Preferred Alternative (APA) from seven possible full-length route alternatives. The APA would consist of a new double-circuit line on a consolidated ROW using a revised Alternative C alignment in the west and primarily Alternative C alignment in the center, and Alternative B alignment in the east.

For additional information, contact:

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For additional information on DOE NEPA activities, contact:

Brian Costner, Acting Director
Office of NEPA Policy and Compliance, GC-54
U.S. Department of Energy
1000 Independence Avenue, S.W.
Washington, D.C. 20585
phone: 800-472-2756 or visit the DOE NEPA website at http://energy.gov/nepa/office-nepa-policy-and-compliance

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Summary

Introduction

Western Area Power Administration (Western) is proposing to rebuild and upgrade two 115-kilovolt (kV) single-circuit transmission lines between Flatiron Substation west of Flatiron Reservoir and the intersection of Mall Road and United States (U.S.) Highway 36 in Estes Park, Larimer County, Colorado. The Estes to Flatiron Transmission Lines Rebuild Project (Project) is subject to the environmental review process mandated under the National Environmental Policy Act (NEPA) of 1969.

This Environmental Impact Statement (EIS) analyzes the environmental consequences of seven action alternatives to rebuild and upgrade the existing 115-kV transmission lines, as well as the No Action Alternative. Western is the lead Federal agency for the NEPA document. The U.S. Forest Service (USFS) has jurisdiction over National Forest System lands crossed by the transmission lines, is a cooperating agency for the EIS, and will be providing its own decision on this EIS.

The EIS has been prepared in accordance with the NEPA of 1969, as amended (42 United States Code [U.S.C.] Section 4321 et seq*.)*, the Council on Environmental Quality (CEQ) regulations for implementing the procedural provisions of NEPA (40 Code of Federal Regulations [CFR] Parts 1500-1508), and U.S. Department of Energy (DOE) and USFS NEPA procedures (10 CFR Part 1021 and 1022, and 36 CFR Part 220).

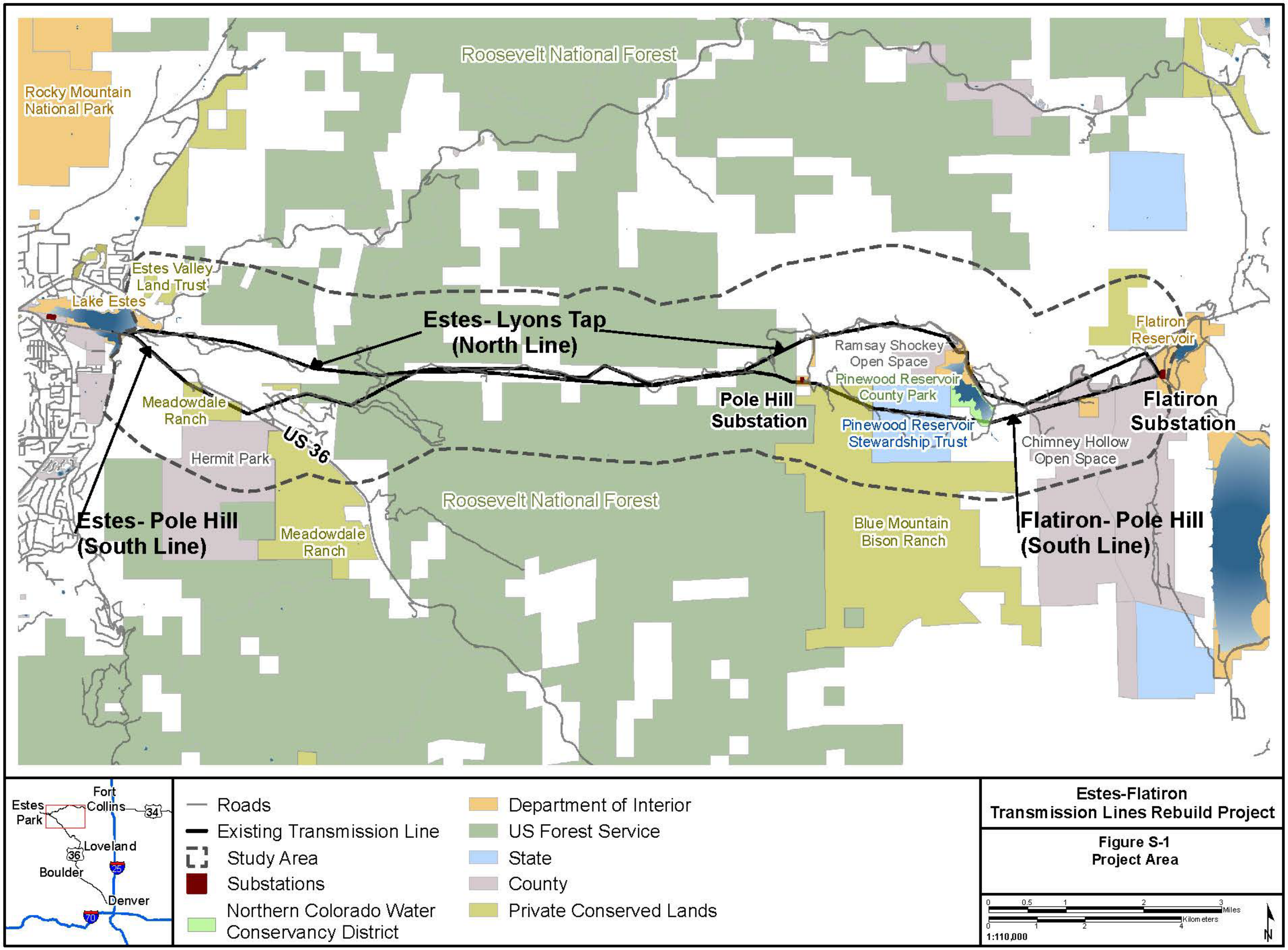
Project Location

The Project is located in Larimer County, Colorado, and extends between Lake Estes on the east side of Estes Park and Western's Flatiron Substation, west of Flatiron Reservoir. The Project area is situated east of the community of Estes Park and west of the Town of Loveland. Major transportation corridors are U.S. Highways 36 and 34, which provide access between Front Range communities to the east and Rocky Mountain National Park to the west of the Project area. The Project area includes private lands in Larimer County, and public lands administered by the U.S. Department of the Interior (DOI), USFS, the Colorado State Land Board (SLB), Northern Colorado Water Conservancy District (NCWCD) and Larimer County. **Figure S-1** shows the general location of the Project.

Background

Western's mission is to market and deliver, renewable, reliable, cost-based Federal hydroelectric power and related services. Western undertakes a variety of construction projects, either on its own or in partnership with other utilities or power customers. Western owns, operates, and maintains two single-circuit transmission lines between the Estes Park and Flatiron Substations. Prior to the formation of the DOE, the DOI's Bureau of Reclamation (BOR) constructed and maintained the two existing transmission lines as part of the Colorado-Big Thompson (CBT) project. The lines were constructed to transmit electricity from hydropower generation sources within the CBT Project. After the formation of the DOE and Western in 1977, ownership, operation, and maintenance of the transmission lines transferred from the BOR to Western.

The Estes-Lyons Tap (E-LT) is the more northern of the two lines and will be referred to in the remainder of this document as the North Line, except where the acronym gives historical context. The second, more southerly line consists of the Estes-Pole Hill (E-PH) and Flatiron-Pole Hill (F-PH) lines which connect the Pole Hill Substation to Estes Park and the Flatiron Substation, respectively (**Figure S-1**). The two south segments will be referred to in this document as the South Line, except where the acronym gives historical context. Both existing transmission lines are 115-kV single-circuit lines constructed on wood pole H-frame structures. The South Line is 14.5 miles in length and the North Line is 14.1 miles long. Western's Project only encompasses the single-circuit wood-pole transmission lines from the east side of the Estes causeway and does not involve the portions of the double-circuit transmission lines located on steel lattice structures along the Estes causeway.



Estes-Flatiron Transmission Lines Rebuild Project

Figure S-1
Project Area

The North Line was built in 1938 and the South Line in 1953. Most of the wood pole H-frame structures on the two lines are original and date from the time of construction. A single mode fiber optic communication cable used by BOR, Western, and the Platte River Power Authority is part of the two lines. Although the majority of the existing rights-of-way (ROWs) are located on privately owned land, portions of both are located on public lands administered by the USFS, SLB, Larimer County Natural Resources Department, and BOR. Both of the existing lines are located within a designated utility corridor as defined in the 1984 Forest Plan for Arapaho and Roosevelt National Forests and Pawnee National Grassland (ARP) and the 1997 Revision.

Proposed Project

Western is proposing to rebuild the existing 115-kV system between Flatiron Substation and the intersection of Mall Road and U.S. Highway 36 in Estes Park. The Project would remove the existing 115-kV single-circuit transmission lines and wood structures and replace them with the following potential options: 1) a new double-circuit 115-kV transmission line on steel monopoles within a single ROW, potentially using a combination of two existing ROWs; 2) a new double-circuit 115-kV transmission line on steel monopoles within a single ROW with the western portion buried in concrete cable trenches for about 2.6 miles, 3) both lines rebuilt as single-circuit transmission lines on wood-pole H-frame structures on separate ROWs, or 4) the No Action Alternative, which would keep the existing lines in place and continue established maintenance activities. The USFS action is to issue an authorization for the portion of the transmission line(s) rebuild that crosses National Forest System lands. The Project would improve access to the transmission lines for maintenance, increase the ability to restore outages more quickly, widen the ROWs where the existing ROW is inadequate, and implement an integrated vegetation management approach within the ROWs to ensure electrical clearance requirements are met and maintained for the life of the project.

Purpose and Need

Western's Purpose and Need

Transmission systems in the U.S. are planned, operated and maintained to meet North American Electric Reliability Corporation (NERC) reliability standards and National Electrical Safety Code (NESC) safety requirements. These organizations establish reliability, safety, and other standards for the bulk power system in the U.S. To fulfill its statutory mission and meet NERC and NESC standards and comply with relevant legal requirements, Western must ensure its facilities meet current standards, are readily accessible for maintenance and emergencies (including vegetation maintenance), are resistant to wildfire, and are cost effective for its customers. Through field inspections and maintenance records, Western has determined that the existing lines need to be upgraded and rebuilt.

Forest Service Purpose and Need

The USFS purpose and need is to determine whether to issue a special use permit for the proposed transmission lines upgrade and rebuild. In conjunction with the issuance, the USFS would bring Western's facilities under a current authorization with a defined ROW and an Operation and Maintenance Plan. The USFS would use the EIS to determine if the Project requires an amendment to the current Forest Plan.

Decision to Prepare an EIS

Western initially began preparation of an environmental assessment (EA) for the Project. Western's Project is under a class of actions in the DOE NEPA Implementing Procedures (10 CFR Part 1021) that normally requires the preparation of an EA. Subsequent to the EA determination, Western held public meetings and received numerous written and oral comments from the public and agencies on the Project during the scoping period. The public expressed concerns regarding the impacts of the proposal and some of the stakeholders requested evaluation of additional alternatives. In response to input received during the initial EA scoping process, Western determined that an EIS would be the more appropriate level of NEPA review.

Public Involvement

Scoping

Potential issues were identified through an expanded public involvement process that included agency discussions, two sets of public scoping meetings, and scoping comments received during two formal scoping periods. The first round of public meetings was held in Estes Park and Loveland, Colorado, on November 29 and 30, 2011. At that time, Western anticipated preparing an EA for the Project. The scoping period for the EA extended from November 29 through January 31, 2012. Additional comments were received through May 2012.

Subsequent to the initial EA scoping period, Western determined that an EIS was the appropriate level of analysis for this Project. A Notice of Intent (NOI) was issued on April 17, 2012 (77 Federal Register 22774). The NOI invited public participation in the EIS scoping process and solicited public comments on the scope of the EIS during a 90-day scoping period initially set to expire on July 16, 2012. An extension of the scoping period to August 31, 2012, was subsequently announced on the Project website, through a press release, email notification, and direct mailing of a Project newsletter. EIS scoping meetings were held on August 6, 2012, in Loveland, Colorado, and August 7, 2012, in Estes Park, Colorado. Both meetings utilized an open house format with exhibits and opportunities for interaction with Western and USFS representatives. In response to public requests to extend the scoping period beyond the August 31, 2012, deadline, Western further extended the scoping period to October 19, 2012.

In total, more than 660 comment letters, forms and emails were received during the two scoping periods for the EA and the EIS. Both the EA and EIS Scoping Summary Reports are available for download from the Project website located at:
https://www.wapa.gov/transmission/EnvironmentalReviewNEPA/Pages/estes-flatiron.aspx.

Alternative Development Workshops

Western implemented an expanded public involvement process for the Project. The expanded public involvement process included three public alternatives workshops held in Estes Park and Loveland during the public scoping period. The purpose of alternatives workshops was to solicit public input on route options and design features to be considered during the alternatives development process for the EIS. Workshops were held on October 2, 2012, in Loveland, and on October 3 and October 4, 2012, in Estes Park.

Alternatives workshops utilized an open house format, and sought to engage meeting attendees in interactive exercises to identify route options. Large-format informational displays provided information about the public involvement process, transmission line siting considerations, and context-sensitive design options. Maps depicting steep slopes, park and open space, parcel boundaries, and viewsheds were on display, as well as large-format composite opportunity and constraint maps, to assist meeting participants with making informed suggestions on potential route options. Map booklets also provided detailed maps showing existing and proposed ROW in relation to parcel boundaries. Transmission structure options also were available for public review. A total of 49 meeting attendees signed in at the public alternatives workshops, including 27 at the meeting in Loveland, and 22 at the meetings in Estes Park.

Issue Identification

Issues were defined as concerns about the potential effects of the Project. The range of issues was determined through agency, stakeholder, and public scoping, as well as through internal scoping between Western and the USFS. Each potential issue was evaluated to determine its relevance to the

Project. If the issue was determined to be a substantial concern, Western, in consultation with the USFS, evaluated whether it should be considered a “key issue” during the alternative development process. Western and the USFS cooperatively documented Key Issues. Key and other issues identified through scoping for the EIS are described below.

Key Issues

Key Issues and other scoping inputs were used to guide the development of alternatives and compare the differences between the alternatives analyzed in detail. Key Issues underlined during the alternatives development included the following:

- Effects of new ROW acquisition on land uses, property owners, and Western's customers.
- Effects on scenic travel corridors (e.g., U.S. Highway 36), residential, and recreational viewsheds in the vicinity of Estes Park, residential developments, such as Meadowdale Hills and Newell Lake View subdivisions, and on National Forest System lands.
- Effects of new road construction in inaccessible areas with steep topography.
- Effects on recreational uses and experiences in the vicinity of Estes Park and Pinewood Reservoir, and on National Forest System lands accessed by USFS Road 122 (Pole Hill Road).
- Effects on protected areas, including county open space, lands protected by conservation easement, lands within the Stewardship Trust Program, and State Wildlife Areas. No protected areas have been identified on National Forest System lands.
- Effects of ROW expansion or new ROW acquisition on existing infrastructure (e.g., Upper Thompson Sanitation District’s treatment plant) and other structures.

Other Issues Selected for Detailed Analysis

Other issues define Project effects to be analyzed in detail in the EIS, but that have not driven alternatives development to the extent of the Key Issues. Other issues identified for detailed analysis included:

- Effects on property values and sources of revenue from tourism and outdoor recreation that Front Range communities and the regional economy rely upon.
- Effects of construction activities (e.g., ground disturbance for access, pole removal, and new structure installation) on cultural resources.
- Effects of ROW clearing and road construction, road reconstruction, road reconditioning and ongoing maintenance on wetlands, soils, and water quality.
- Potential effects of electric and magnetic fields from high-voltage power lines on human health.
- Effects on wildlife; plants; fisheries; threatened, endangered and USFS sensitive species; management indicator species; and general species of wildlife, plants (vegetation) and fish.
- Effects of increased traffic on resources due to West Pole Hill Road improvement under Alternatives C and C1.

Issues Considered but Not Analyzed Further

The following issues were considered but not analyzed further:

- Comments that Western should replace the lattice structures along the causeway of Lake Estes as part of this Project. The lattice structures are already double-circuit and are not part of the scope of this Project.

- Comments that the Estes-Pole Hill transmission line are not within the USFS designated utility corridor as outlined in the ARP Forest Plan, and that consolidating the two lines on the South Line would not be in compliance with the ARP Forest Plan. The USFS has stated that the designated utility corridor includes both the transmission line ROWs (USFS 2012a).
- Comments that the Project is a "waste of taxpayer funds" were determined to be outside the scope of the EIS.
- A request that Western complete a socio-economic analysis of tourist and recreation based economies in Denver, Fort Collins, Boulder, and other Front Range cities supported by the Roosevelt National Forest. Socioeconomic issues are analyzed in the EIS; however, because socio-economic effects of rebuilding the transmission line would not extend beyond the immediate Project vicinity, the analysis area is limited to the Town of Estes Park and Loveland.
- A request that Western expand notification during scoping and publish notices in papers in Denver, Boulder, and Longmont. Newspaper notices have been targeted for those communities where there is the greatest interest and potential for effects. Residents of Estes Park and Loveland would experience the greatest effects, and represent approximately 50 percent of the mailing addresses in the Project mailing list. Therefore, newspaper notices have been published in the Estes Park Trail-Gazette and Loveland Reporter-Herald. The USFS also published notices in their Newspaper of Record, which is the Fort Collins Coloradoan. Direct mailings, press releases, and website updates are the primary means to communicate Project updates to individuals that have shown an interest in the Project and reside outside Estes Park and Loveland.
- Comments expressing general support for, or opposition to, the Project without supporting rationale were determined to be expression of opinion, non-substantive, or outside the scope of the EIS.

Decisions Framework

Western and the USFS prepared the EIS as the lead and cooperating Federal agencies, respectively. The results of the analysis are presented in this EIS and will form the basis for decisions regarding the Project.

Following the Draft EIS review and comment period, Western and the USFS considered comments submitted by the public, interested organizations and government agencies. Responses to all substantive comments are included in Chapter 9.0. Based on the Draft EIS and public input, Western and the USFS designated their Agency Preferred Alternative (APA) and provided rationale. Public notice of the APA was released on Western's Project website as well as to interested parties December 2016. Western will issue a Record of Decision (ROD) no sooner than 30 days following the issuance of this Final EIS. Western may combine elements of alternatives considered in the EIS in the ROD.

As a cooperating agency, the USFS will prepare its own ROD in accordance with its respective policies and guidelines. The USFS is required to comply with all laws (National Forest Management Act, NEPA, Section 7 of the Endangered Species Act [ESA], National Historic Preservation Act, etc.), regulations, and policies for the portion of the Project on lands under its jurisdiction.

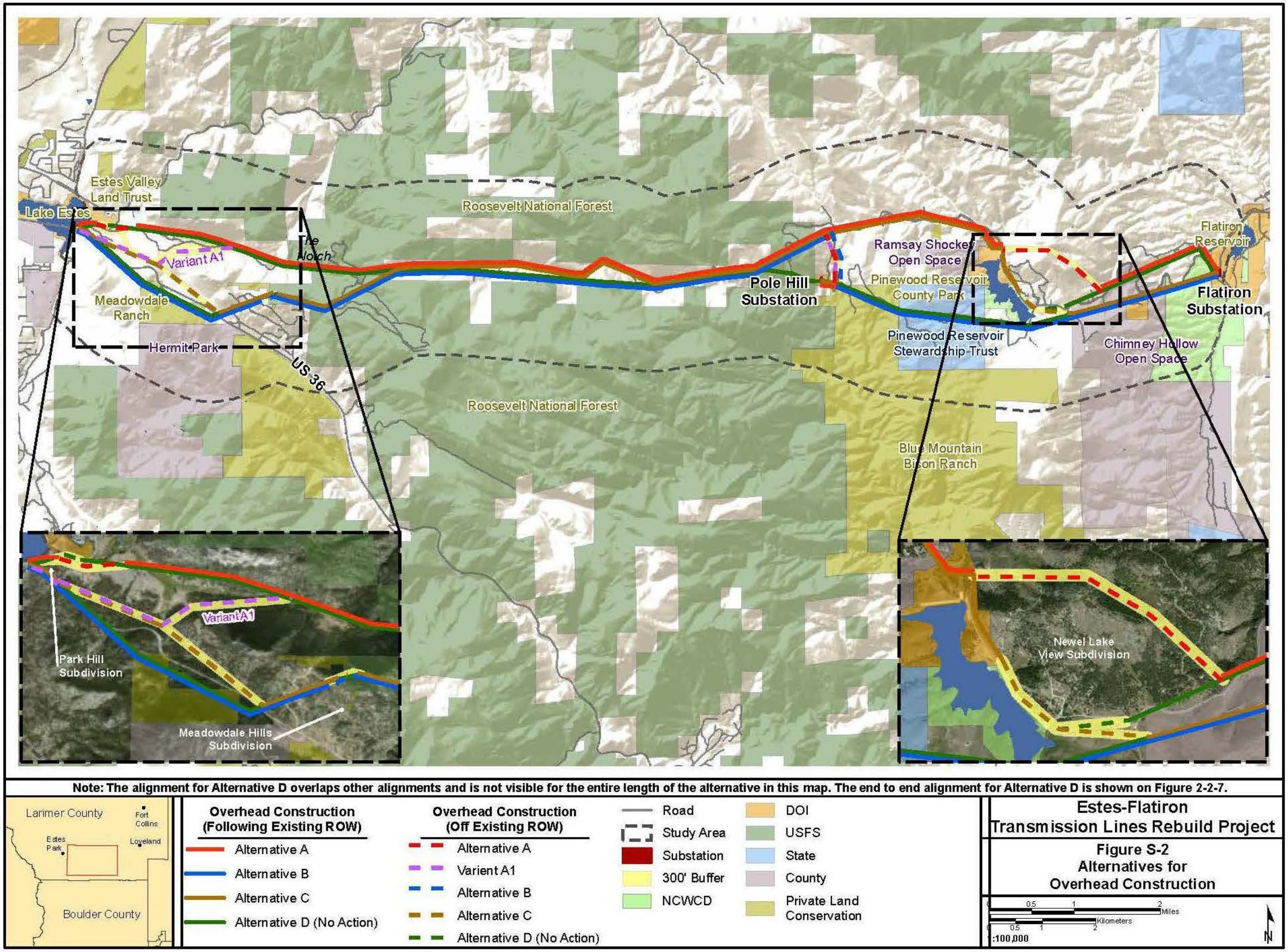
Instrumental to the decisions will be the consideration of measureable indicators that have been defined to evaluate the effects of the different alternatives with regard to key and other issues. The measurable indicators used to compare the alternatives are presented in **Tables S-4**, **S-5**, and **S-6**. The USFS decision will be subject to a pre-decisional objection process. In order to have standing to object to the USFS decision, a person(s) or organization must have submitted specific written comments during the 45-day public comment period on the Draft EIS. These comments are addressed in this Final EIS, Chapter 9.0. The Final EIS, Western draft ROD, and USFS draft ROD will be made available to the public. The 45-day Objection Period will begin with publication of a legal notice in the USFS newspaper of record, the Fort Collins Coloradoan. This objection process is provided in compliance with the Consolidated Appropriations Act of 2012.

Alternatives Considered in Detail

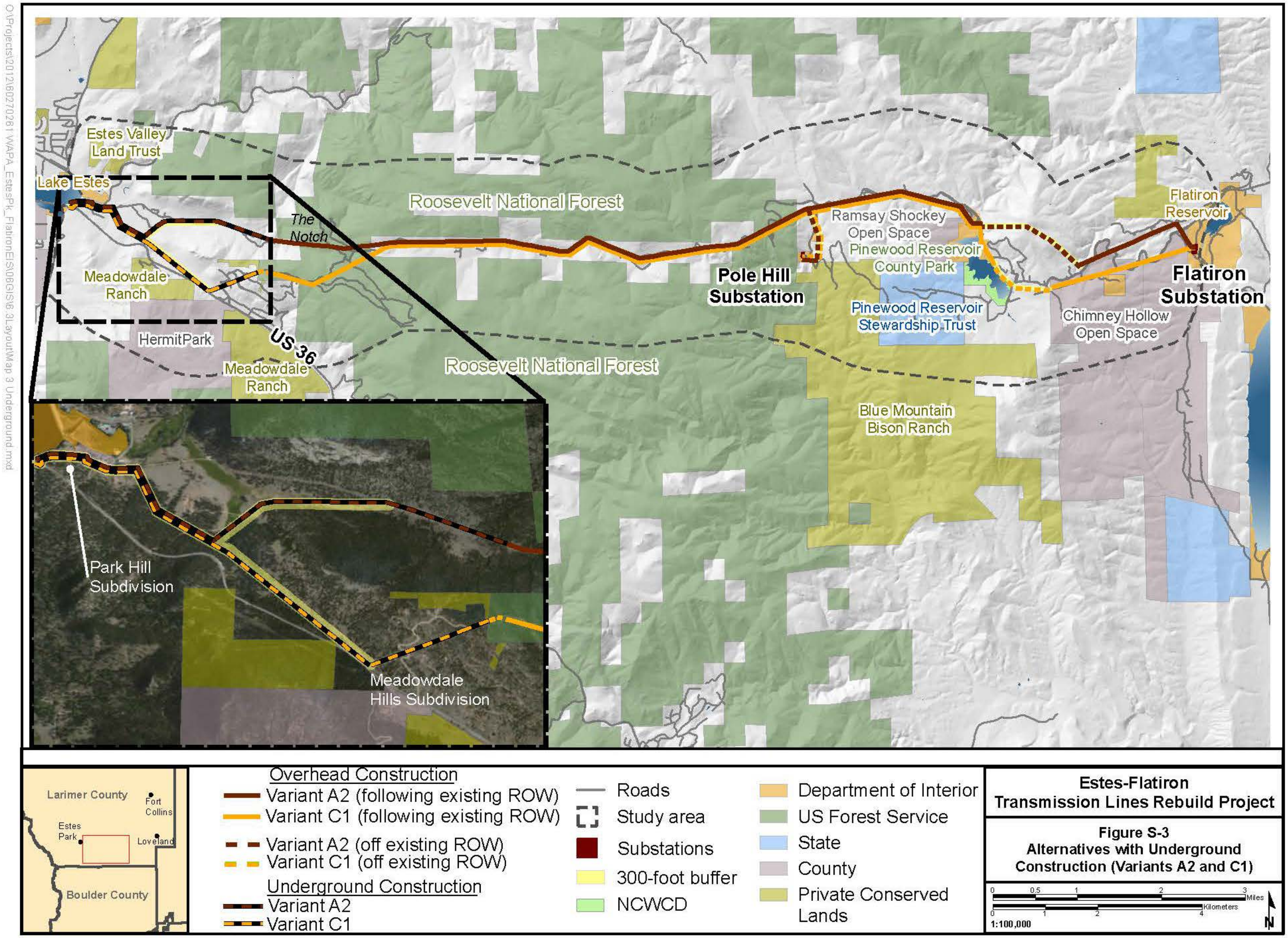
A range of reasonable alternatives for the Project was identified by evaluating routing opportunities and constraints, engineering design standards, public comments, and environmental resources that occur within the Project area. The objective was to identify alternatives that address public, environmental, and social concerns, while meeting the Project purpose and need and engineering criteria for the transmission lines rebuild Project. This process resulted in a set of action alternatives evaluated in the Draft EIS.

In the Draft EIS, seven full-length alternatives to rebuild and upgrade the existing 115-kV transmission lines were identified for detailed analysis, in addition to the No Action Alternative. These are described briefly below. In this EIS "variants" refer to alternatives that involve routing variations off the main alternative, whereas "reroutes" are any section of the alignment that is off existing ROW. Variants are considered Project alternatives and are evaluated as such. The alignments of alternatives using overhead construction methods are shown on **Figure S-2**. The alignment alternatives using underground construction methods are shown on **Figure S-3**.

- **No Action Alternative** – Keep the existing transmission lines in service through continuing structure replacement and maintenance. The existing ROWs would be expanded, as needed and minor adjustments made to the alignments where necessary in order to comply with NERC and NESC requirements. A segment through the Newell Lake View subdivision would be relocated and a new ROW acquired if necessary.
- **Alternative A** – Rebuild and consolidate the transmission lines primarily on the existing North transmission line ROW. This alternative includes a reroute to the north and northeast of Newell Lake View subdivision and along Mall Road in Estes Park (**Figure S-2**).
  - **Variant A1** – Variant A1 is identical to Alternative A for all but the westernmost segment (**Figure S-2**). At a point in the valley between Mount Olympus and Mount Pisgah, this routing variation would depart from the alignment of the existing North Line and traverse along the base of Mount Pisgah before turning to the northwest and generally following an alignment parallel to U.S. Highway 36 for the remaining distance to the existing steel lattice double-circuit structure at the intersection of U.S. Highway 36 and Mall Road.
  - **Variant A2** – Variant A2 follows an alignment similar to Variant A1; however, the westernmost 2.7 miles of the transmission line would be constructed underground (**Figure S-3**).
- **Alternative B** – Rebuild and consolidate the transmission line, primarily on the existing South Line ROW. This alternative includes a 0.25-mile reroute along Pole Hill Road on National Forest System lands, and a 0.75-mile reroute to the North Line on new ROW in the vicinity of Pole Hill Substation (**Figure S-2**).
- **Alternative C** – Rebuild and consolidate the transmission lines along an alignment that utilizes a combination of the existing North and South line ROWs. This alternative includes reroutes off existing transmission line ROW east of Pinewood Reservoir, along Pole Hill Road on National Forest System lands, and on privately held land on the west end of the Project area (**Figure S-2**).
  - **Variant C1** – Rebuild and consolidate the transmission lines along an alignment that utilizes a combination of the existing North and South line ROWs. This alternative follows an alignment similar to Alternative C; however, the westernmost 2.7 miles of the transmission line would be constructed underground (**Figure S-3**).



Estes Valley Land Trust
Lake Estes
Roosevelt National Forest
Variant A1
The Notch
Meadowdale Ranch
Hermit Park
US 36
Roosevelt National Forest
Pole Hill Substation
Ramsay Shockey Open Space
Pinewood Reservoir County Park
Pinewood Reservoir Stewardship Trust
Flatiron Reservoir
Flatiron Substation
Chimney Hollow Open Space
Blue Mountain Bison Ranch
Variant A1
Park Hill Subdivision
Meadowdale Hills Subdivision
Newel Lake View Subdivision
Note: The alignment for Alternative D overlaps other alignments and is not visible for the entire length of the alternative in this map. The end to end alignment for Alternative D is shown on Figure 2-2-7.
Larimer County
Fort Collins
Estes Park
Loveland
Boulder County
Overhead Construction (Following Existing ROW)
Alternative A
Alternative B
Alternative C
Alternative D (No Action)
Overhead Construction (Off Existing ROW)
Alternative A
Varient A1
Alternative B
Alternative C
Alternative D (No Action)
Road
Study Area
Substation
300' Buffer
NCWCD
DOI
USFS
State
County
Private Land Conservation
Estes-Flatiron Transmission Lines Rebuild Project
Figure S-2 Alternatives for Overhead Construction
Miles
Kilometers
1:100,000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Estes Valley Land Trust
Lake Estes
The Notch
Roosevelt National Forest
Meadowdale Ranch
HermitPark
US 36
Meadowdale Ranch
Roosevelt National Forest
Ramsay Shockey Open Space
Pinewood Reservoir County Park
Pole Hill Substation
Pinewood Reservoir Stewardship Trust
Flatiron Reservoir
Flatiron Substation
Chimney Hollow Open Space
Blue Mountain Bison Ranch
Park Hill Subdivision
Meadowdale Hills Subdivision
Larimer County
Fort Collins
Estes Park
Loveland
Boulder County
Overhead Construction
Variant A2 (following existing ROW)
Variant C1 (following existing ROW)
Variant A2 (off existing ROW)
Variant C1 (off existing ROW)
Underground Construction
Variant A2
Variant C1
Roads
Study area
Substations
300-foot buffer
NCWCD
Department of Interior
US Forest Service
State
County
Private Conserved Lands
Estes-Flatiron Transmission Lines Rebuild Project
Figure S-3
Alternatives with Underground Construction (Variants A2 and C1)
0 0.5 1 2 3 Miles
0 1 2 4 Kilometers
1:100,000
N

- **Alternative D** – Rebuild the two existing transmission lines in-kind as single-circuit lines located on separate ROWs. This alternative would utilize structures similar to those currently in use, although structure height could increase by 5 to 10 feet. The existing ROWs would be expanded as needed and minor adjustments made to the alignments where necessary to comply with NERC and NESC requirements. This alignment includes a reroute to Pole Hill Road where there is inadequate ROW through Newell Lake View subdivision and relocation of one structure on the north side of the Upper Thompson Sanitation District parcel in Estes Park, to accommodate future expansion of their facility (**Figure S-2**).

To select an APA, Western looked to the factors within its purpose and need statement that an alternative would have to satisfy (Section 1.4.1). Ideally, the selected APA best meets the purpose and need while having the least impact on the human environment. Alternatives that met the basic purpose and need requirements, but had less impact than an alternative that better met the purpose and need, were carefully considered for selection as the APA. However, alternatives that clearly did not meet purpose and need requirements were not considered for selection.

The detailed analysis of the seven full-length alternatives and the No Action Alternative supported Western's selection of an APA that incorporated parts of several full-length alternatives. As depicted in **Figure S-4**, the APA would be a new double-circuit line between Flatiron Substation and U.S. Highway 36 at the intersection of Mall Road using Alternative C alignment in the west and primarily Alternative C alignment in the center, and Alternative B alignment in the east. Using portions of two alternatives allowed Western to further reduce expected environmental impacts while meeting the purpose and need objectives for the Project. The APA is presented in **Figure S-4** and described in Sections 2.2.1.9 and 2.8.1. The rationale for the selection is presented in Section 2.8.2.

Key Differences between Alternatives

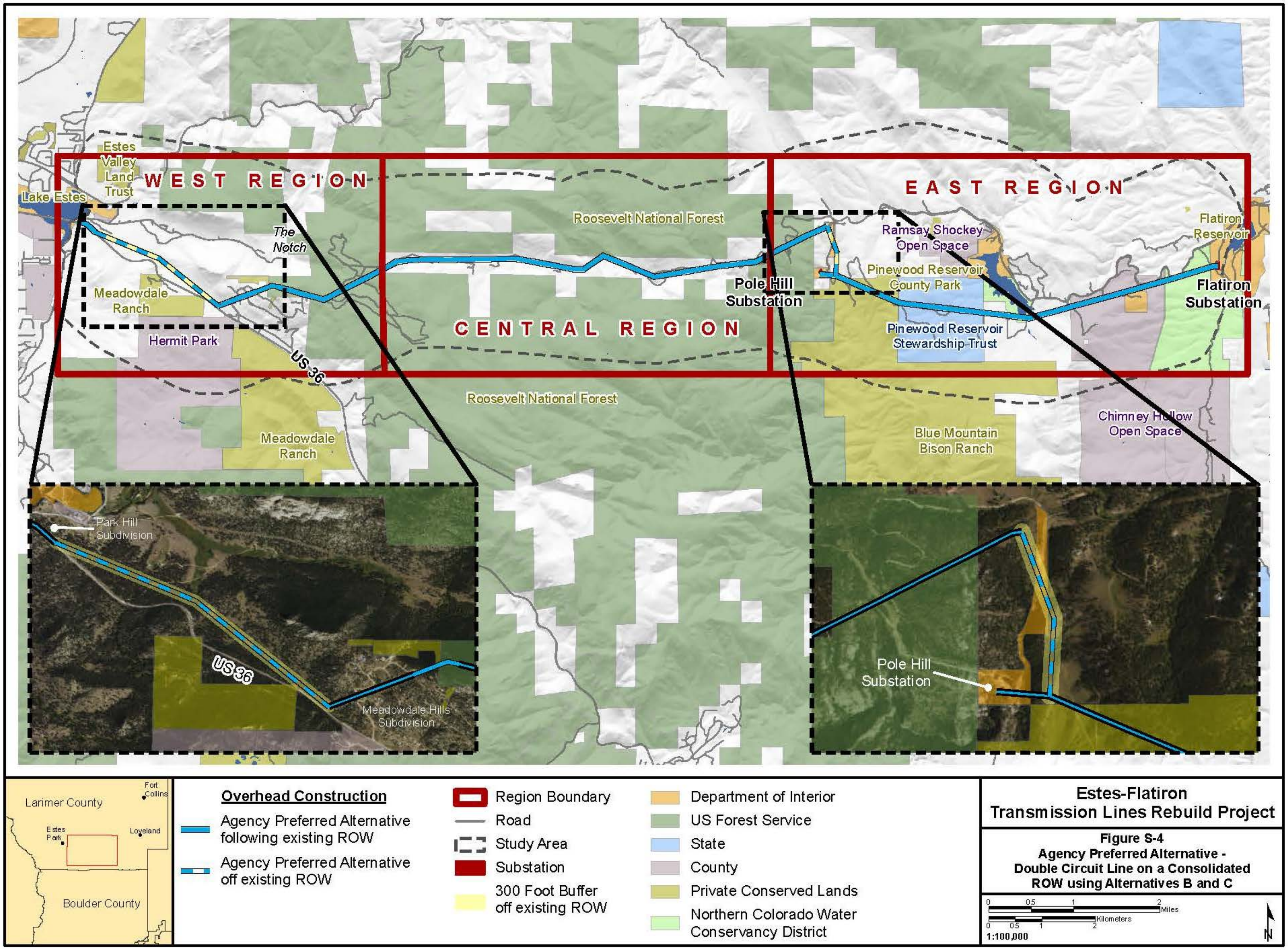
The key differences between the alternatives are route alignment (north or south of Mount Pisgah, and north or south of Pinewood Reservoir), ROW type (new or existing), transmission line type (single-circuit or double-circuit), transmission structure type (steel monopole or wood H-frame), and transmission line construction method (overhead or underground).

Alternatives A, B, and C and Variants A1, A2, C1, and the APA would all consolidate a rebuilt double-circuit transmission line onto a single ROW. The transmission line would be constructed overhead on steel monopoles for the entire length of the line under Alternatives A, B, and C and Variant A1, and the APA; Variants A2 and C1 would construct the westernmost 2.7 miles of the double-circuit line underground on different alignments. Alternative D proposes to rebuild both existing transmission lines as single-circuit lines on primarily existing ROW using wood H-frame structures.

Access requirements also are a key difference between the alternatives. Alternative A and Variants A1 and A2 traverse steep terrain with poor access on National Forest System lands in the vicinity of The Notch (**Figures S-2** and **S-3**). Other areas with steep terrain and poor access include the alignment for Alternative A north of the Newell Lake View subdivision, the alignment for Alternative B on existing ROW south of U.S. Highway 36, and the alignment for Alternative D on existing ROW west of Pole Hill Substation.

Estimates of short-term disturbance areas associated with transmission line construction are provided in **Table S-1** below. Long-term disturbance for structure bases would be less than 0.1 acre for any alternative.

A comparison of rough order of magnitude life-cycle costs for the seven end-to-end alternatives, the APA and the No Action is provided in **Table S-2** below.



Lake Estes
Estes Valley Land Trust
WEST REGION
CENTRAL REGION
EAST REGION
The Notch
Meadowdale Ranch
Hermit Park
US 36
Roosevelt National Forest
Pole Hill Substation
Ramsay Shockey Open Space
Pinewood Reservoir County Park
Pinewood Reservoir Stewardship Trust
Flatiron Reservoir
Flatiron Substation
Blue Mountain Bison Ranch
Chimney Hollow Open Space
Park Hill Subdivision
Meadowdale Hills Subdivision
Larimer County
Fort Collins
Estes Park
Loveland
Boulder County
Overhead Construction
Agency Preferred Alternative following existing ROW
Agency Preferred Alternative off existing ROW
Region Boundary
Road
Study Area
Substation
300 Foot Buffer off existing ROW
Department of Interior
US Forest Service
State
County
Private Conserved Lands
Northern Colorado Water Conservancy District
Estes-Flatiron Transmission Lines Rebuild Project
Figure S-4
Agency Preferred Alternative - Double Circuit Line on a Consolidated ROW using Alternatives B and C
Miles
Kilometers
1:100,000
N

Table S-1 Summary of Short-term Disturbance for Transmission Line Construction by Alternative

Project Component	Disturbance Area	Short-term Disturbance by Alternative (acres)						
		A/A1	**A2**	**B**	**C**	**C1**	**APA**	**D**
Structure installation	0.26 acre per structure	18 - 24	15 - 20	20 - 26	19 - 25	15 - 21	19-26	56 - 65
Conductor stringing sites	0.25 acre per site	1 - 3	1 - 2	1 - 3	1 - 3	1 - 2	1-3	2 - 5
Staging areas	2-3 sites; 5 acres per site	10 - 15	10 - 15	10 - 15	10 - 15	10 - 15	10-15	10 - 15
Removal of existing H-frame structures	0.22 acre per structure	45	44	45	45	44	45	41
Pulling sites for line removal	0.25 acre per site	1 - 3	1 - 2	1 - 3	1 - 3	1 - 2	1-3	2 - 5
Underground construction	9 acres per mile	NA	24	NA	NA	25	NA	NA
Total		**75 - 90**	**95 - 108**	**77 - 92**	**75 - 90**	**96 - 108**	**76-91**	**112 -132**

Table S-2 Preliminary Transmission Line Cost Estimates by Alternative

	Alternative ($ millions)								
	A	**A1**	**A2**	**B**	**C**	**C1**	**APA**	**D**	**No Action**
80-year construction cost	18.9	19.2	45.4	17.1	17.2	42.6	16.6	51.8	56.9
80-year maintenance cost	1.2	1.2	1.1	1.1	1.2	1	1.1	3.1	3.1
80-year vegetation management cost	1.6	1.6	1.4	1.8	1.8	1.5	1.7	3.2	3.2
Total 80-year life cycle cost	21.7	21.9	47.8	19.9	20.1	45	19.3	58	63.2
Easement acquisition cost	1.9	1.6	1.6	0.4	0.8	1.4	0.4	1.7	1.7
Total	**23.6**	**23.5**	**49.4**	**20.3**	**20.9**	**46.4**	**19.7**	**59.7**	**64.9**

Alternatives Considered but Eliminated

Alternative Alignments

In addition to the alignments carried forward for detailed analysis in the Draft EIS, several additional routing alternatives were identified and considered. Some of these potential alternatives emerged through a series of public workshops held in October 2012 that were intended to review the constraint/opportunity criteria and to solicit public comment on potential alternative alignments. Through this process, a wide range of potential routing alternatives were considered. Some of the potential routing alternatives were carried forward for detailed analysis while others were eliminated following an initial consideration of their feasibility. Alternative alignments considered but eliminated, including the reasons for their elimination, are summarized in **Table S-3** below.

Table S-3 Alternative Alignments Dismissed from Detailed Analysis

Potential Reroute	Reason for Dismissal
U.S. Highway 34 and U.S. Highway 36 reroutes	Proposals to reroute the transmission line along U.S. Highways 34 and 36 would not use existing transmission line ROWs and would instead follow existing transportation ROWs. These proposals were not carried forward because they would greatly increase visual impacts, an important consideration in this area. These proposals would not resolve the issues raised during scoping, but would simply displace impacts to new landowners and may require constructing an additional length of transmission line. Locating the lines along these routes also adds flooding as another possible major catastrophic future event that may affect the transmission lines.
Reroute west of Meadowdale Hills subdivision, on the east slope of Mount Pisgah	This potential route crosses steep, rocky slopes without any existing access roads, and would be difficult and costly to construct, and would result in substantial erosion risks as well as increased maintenance costs. Access road construction across this topography would require excessive cut and fill and increase visual impacts, and would potentially result in heightened safety concerns to maintenance crews.
Reroute to the south side of the North Line, below The Notch	This potential route is located in an area with steep slopes and poor access; also it follows a riparian corridor. Western's standard construction practice (SCPs) direct that structure sites, access ways, and other disturbance areas will be located at least 100 feet, where practical, from rivers and streams (including ephemeral streams). Because this route would be in difficult terrain and follows a riparian corridor it was not considered suitable for siting the transmission line.
Reroutes far to the south of the South Line in the vicinity of Pinewood Reservoir Stewardship Trust and Blue Mountain Bison Ranch	This routing strategy was suggested during workshops to reduce effects to recreational and residential viewsheds at Pinewood Reservoir. These reroutes were dismissed because they crossed protected lands, did not fully address the visual resource issue, and displaced existing impacts to new landowners. Some area residents suggested a reroute around the north side of Newell Lake View subdivision to reduce visual impacts to their community, and a routing option was identified and carried forward for detailed analysis (Alternative A).
A reroute that followed a gas pipeline between the North and South Line on the east end of the Project area, between the access road to the Bald Mountain radio facility and the intersection of Pole Hill Road and Chimney Hollow Road	This reroute was suggested as a means to co-locate linear infrastructure. However, the reroute fails to effectively address other scoping issues related to visual impacts and would require new ROW acquisition resulting in new acquisition costs and subsequent new surface disturbance, as well as displacement of impacts to new landowners. There also may be additional mitigation required by the gas utility, if Western were to site a transmission line parallel to an existing gas line.

Table S-3 Alternative Alignments Dismissed from Detailed Analysis

Potential Reroute	Reason for Dismissal
Reroute following Flatiron Penstocks (CBT Project)	In an effort to further consolidate linear facilities, consideration was given to an alignment that paralleled the penstocks that descend Bald Mountain to Flatiron Reservoir. The penstocks emerge aboveground well below the summit of Bald Mountain and follow an alignment that is prominent in the viewshed from Flatiron Reservoir, one that doesn't take advantage of the opportunities for concealment provided by the surrounding terrain. Steep and rocky terrain also would contribute to access concerns. Further, the penstocks are facilities that date to the 1940s and have a degree of historic significance.
Reroute along Cottonwood Creek	This reroute would extend from the vicinity of Flatiron Reservoir and follow an alignment to the northwest generally along Cottonwood Creek, rejoining the ROW of the existing North Line near Pinewood Reservoir Dam. This alternative would require several miles of construction through steep terrain with poor access. It was dropped in favor of Alternative A that avoided the Pinewood Reservoir viewshed and the adjacent subdivision in a more direct and effective manner.

Alternative Structure Types

In addition to routing options, alternative Project designs were considered and presented during the public workshops held in October 2012. Other project structure designs considered included steel lattice structures and double-circuit wood H-frame structures. Double-circuit wood H-frame structures are unconventional and rarely used by Western for reliability reasons. Western does not currently consider lattice steel structures or double-circuit wood H-frame structures a viable option. Neither the lattice nor double-circuit H-frame designs were carried forward for further analysis.

Use of Olympus Tunnel

The Olympus Tunnel begins below Lake Estes and extends to the east through Mount Olympus eventually meeting up with the Pole Hill Tunnel and other CBT Project facilities that extend all the way to Flatiron Reservoir. The possibility of placing an underground cable system within the Olympus Tunnel and other below ground facilities was identified as a potential opportunity, one that would reduce or eliminate visual impacts and other identified concerns. Although such systems have been installed in other water conveyance tunnels, including the Adams Tunnel through Rocky Mountain National Park, they are only feasible when the facility is specifically designed to accommodate the cables and splices at the time of its initial construction. Placing a cable within a tunnel not designed and constructed to accommodate one would diminish the capacity of the facility to deliver water and function as designed, and also would create considerable operational, scheduling, and maintenance challenges. As an example, water delivery would have to be suspended and the tunnel drained for any kind of cable maintenance. For these reasons, this alternative was not considered feasible and it was dropped from further consideration.

Underground Construction near Pinewood Reservoir

Due to the sensitivity of the viewshed south of Pinewood Reservoir, underground construction was considered for a segment of the Project through this area, following the alignment of Alternative B. Underground construction presents a number of challenges, including substantially higher costs than conventional aboveground construction. The increase in cost needs to be weighed against the expected benefits, in this case an incremental decrease in visual impacts. Western also does not currently maintain any underground lines and therefore does not have the expertise, equipment, or replacement material to maintain an underground transmission line. Any maintenance or repair would need to be contracted out, potentially resulting in longer outages. Alternative A would avoid the viewshed south of Pinewood Reservoir, providing an alternative that would eliminate these impacts at a much lower cost. For these reasons, underground construction at this location was dropped from further consideration.

Underground Construction on National Forest System Land

Variant C1 would rebuild the transmission line underground from the Mall Road east to the National Forest System boundary near the north end of the Meadowdale Hills subdivision. Western considered extending Variant C1 further east onto National Forest System lands, but dismissed that potential option based on the following technical reasons.

- Extending Variant C1 further east along the proposed alignment for Alternative C would involve costly trenching within a rocky rough section of Pole Hill Road that is noted for its recreational value to high clearance off road vehicle users (hereafter referred to as four-wheel drive users). Restoring Pole Hill Road to previous conditions following installation of cable trenches would not be possible, unless the cable trenches were buried deeper. Continued use of Pole Hill Road would impact the integrity of cable trenches.
- Terminating the underground section on National Forest System land would require an underground service vault. This vault could not be located on Pole Hill Road and would require that the vault be located off the road. The installation of the vault would require the clearing of a large forested area to accommodate the vault installation and future access.
- Extending Alternative C1 along the existing South Line route would require extensive clearing within a mixed coniferous forest. The width of the clearing would need to accommodate the trench, a spoil pile, and a service road to accommodate the installation of the cable trench and service vault.

Impact Comparison

Tables S-4, **S-5**, and **S-6** compare the alternatives and APA using measurable indicators, with regard to Key Issues and other issues identified in Section 1.6.3. **Table S-4** compares the alternatives over their full lengths. Based on public input, additional summary impact tables were produced (**Tables S-5** and **S-6**) which compare the impacts for just the ends of the Project (west region and east region). **Table S-7** provides a summary comparison of environmental effects by resource and alternative. Data presented in these tables were based on specific effects of each alternative on each resource and can be found in Chapter 4.0. Data presented in **Tables S-4** through **S-6** have been modified slightly in comparison to the Draft EIS presentation, to take advantage of new data availability and revised ROW acquisition needs, as well as to include the APA.

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Table S-4 Measurement Indicators for Key and Other Issues, Full-length Alternatives

Measurement Indicators for Issues	Alternative A	Variant A1	Variant A2	Alternative B	Alternative C	Variant C1	Alternative D	APA	No Action Alternative
Issue: ROW acquisition									
Acres of new ROW acquisition [1]	140	144	137	42	101	102	120	87	120
Acres of new ROW acquisition (National Forest System lands) [1]	14	14	14	10	10	10	14	10	14
Acres of ROW to be decommissioned [1]	154	159	158	57	132	131	2	105	2
Linear miles of ROW to be decommissioned[1]	15	16	16	14	16	16	1	15	1
Miles of land ownership crossed	Private - 12.5 USFS - 1.5 DOI - 0.1 SLB - 0.0 NCWCD - 0.4 County - 0.6	Private - 12.7 USFS - 1.5 DOI - 0.1 SLB - 0.0 NCWCD - 0.4 County - 0.5	Private - 12.8 USFS - 1.5 DOI - 0.1 SLB - 0.0 NCWCD - 0.4 County - 0.5	Private - 9.9 USFS - 2.0 DOI - 0.1 SLB - 1.0 NCWCD - 0.8 County - 1.0	Private - 11.2 USFS - 2.0 DOI - 0.1 SLB - 0.0 NCWCD - 1.1 County - 1.1	Private - 11.3 USFS - 2.0 DOI - 0.1 SLB - 0.0 NCWCD - 1.1 County - 1.1	Private - 20.8 USFS - 3.4 DOI - 0.2 SLB - 1.0 NCWCD - 1.5 County - 1.7	Private - 10.0 USFS – 2.0 DOI – 0.1 SLB – 1.0 NCWCD - 0.8 County – 1.0	Private - 20.8 USFS - 3.4 DOI - 0.2 SLB - 1.0 NCWCD - 1.5 County - 1.7
Issue: effects on visual resources									
Existing Scenic Integrity Objective (SIO) (National Forest System lands)	Moderate	Moderate	Moderate	Moderate	Moderate	Moderate	Moderate	Moderate	Moderate
Resulting SIO (National Forest System lands)	Very Low[2]	Very Low[2]	Very Low[2]	Very Low[2]	Very Low[2]	Very Low[2]	Moderate	Very Low[2]	Moderate
Issue: Forest road construction/reconstruction [3]									
Miles of new administrative road on National Forest System land for permanent access	0.9	0.9	0.9	0.6	0.6	0.6	2.0	0.6	2.0
Reconstruction of existing maintenance level 2 (ML2) system road on National Forest System lands (miles)	0	0	0	0	0	0	0	0	0
Limited reconditioning of existing ML2 system road post-construction (miles)	2.5	2.5	2.5	3.4	3.8	3.8	3.4	3.8	3.4
Issue: recreational uses and experiences									
Long-term changes in recreation opportunities on National Forest System lands	No Changes due to Project[4]	No Changes due to Project[4]	No Changes due to Project[4]	No Changes due to Project[4]	Significant adverse impacts to four-wheel drive opportunities due to west Pole Hill Road upgrade; increased opportunities for dispersed recreation.	Significant adverse impacts to four-wheel drive opportunities due to west Pole Hill Road upgrade; increased opportunities for dispersed recreation.	No Changes due to Project[4]	No Changes due to Project[4]	No Changes due to Project[4]
Issue: protected lands									
No. protected lands crossed [5]	4	4	4	5	4	4	6	5	6
Issue: effects on infrastructure									
Conflicts with Upper Thompson Sanitation District	No	No	No	No	No	No	No	No	Limits facility expansion
Colorado-Big Thompson (CBT) Pole Hill Penstocks[8]	No	No	No	No	No	No	No	No	No
Issue: property values and economic effects									
No. of landowners affected by ROW acquisition [1]	59	49	60	23	51	74	61	24	61
New ROW	17	12	23	3	14	37	13	4	13
Expanded ROW	42	37	37	20	37	37	48	20	48
No. of landowners affected by both new ROW and expanded ROW acquisition [1]	53	46	56	21	47	69	55	23	55

Table S-4 Measurement Indicators for Key and Other Issues, Full-length Alternatives

Measurement Indicators for Issues	Alternative A	Variant A1	Variant A2	Alternative B	Alternative C	Variant C1	Alternative D	APA	No Action Alternative
Subdivisions affected by ROW acquisition (new or expanded ROW)	Park Hill Newell Lake	Park Hill Newell Lake	Park Hill Newell Lake	Park Hill	Park Hill Newell Lake	Park Hill Newell Lake	Park Hill Newell Lake	Park Hill	Park Hill Newell Lake
No. of landowners with ROW to be decommissioned	58	61	60	61	50	48	17	62	17
Businesses directly affected	NA	NA	NA	NA	Four-wheel drive tour operator	Four-wheel drive tour operator	NA	NA	NA
Issue: cultural resources									
Number of National Register of Historic Places (NRHP)-eligible historic sites potentially impacted	4	5	4	3	5	4	5	5	5
Issue: water resources, floodplains, and wetlands [6]									
Waterbodies Crossed	44	41	41	34	42	42	67	38	66
Wetlands Present	15	14	15	9	14	13	21	12	20
Waters of the U.S.	20	18	20	14	22	20	29	20	29
Issue: ROW clearing and maintenance									
Soil types in Analysis Area [7]									
Soils with shallow bedrock (within 60 inches of soil surface) (acres)	279	326	266	316	320	271	521	285	515
Low revegetation potential (acres)	32	97	37	101	68	26	144	68	144
Compaction prone (acres)	123	123	122	71	173	161	207	120	200
Water erodible (acres)	164	172	160	114	114	111	215	94	217
Vegetation types in ROW [8]									
Ponderosa pine woodland (acres)	136	145	139	103	128	124	210	118	210
Mixed conifer forest (acres)	9	13	9	34	17	17	42	17	42
Mountain shrub mosaic (acres)	29	25	28	28	34	35	63	31	63
Upland meadow, or upland meadow/wetland mosaic (acres)	16	10	15	17	16	20	39	17	39
Issue: electric and magnetic fields									
Electric fields at ROW edge (kilovolt per meter [kV/m]) [9]	0.12	0.12	0	0.12	0.12	0	0.34	0.12	0.34
Magnetic fields at each ROW edge (milligauss [mG]) [10]	5.2/1.8	5.2/1.8	0.05	5.2/1.8	5.2/1.8	0.05	5.2/5.3	5.2/1.8	5.2/5.3
Issue: effects on plants, wildlife, and fish									
Special Status Plants [11]									
Threatened and endangered	NLAA	NLAA	NLAA	NLAA	NLAA	NLAA	NLAA	NLAA	NLAA
Sensitive species	MAII	MAII	MAII	MAII	MAII	MAII	MAII	MAII	MAII
Species of local concern	LP	LP	LP	LP	LP	LP	LP	LP	LP
Big Game [12]									
Elk and Mule Deer Winter Range (acres)	83	84	97	84	82	103	122	81	122
Moose Winter Range (acres)	35	36	39	38	36	42	56	36	56
Special Status Wildlife [13]									
Threatened and endangered [14]	No Effect; None Present	No Effect; None Present	No Effect; None Present	No Effect; None Present	No Effect; None Present	No Effect; None Present	No Effect; None Present	No Effect; None Present	No Effect; None Present
Sensitive species	MAII	MAII	MAII	MAII	MAII	MAII	MAII	MAII	MAII
Management indicator species	NC	NC	NC	NC	NC	NC	NC	NC	NC

[1] The transmission line ROW acquisition footprint was revised based on a June 11, 2015 call between Carey Ashton (Western) and Steve Ensley (AECOM). Transmission ROW acreage does not include access roads.

[2] Would require lowering of SIO and documentation of change of SIO in MA 8.3 - Utility Corridor for this Project area, in accordance with Forest Plan Standard 154 and also documentation in the USFS ROD.

[3] All construction and reconstruction analyses were calculated with Western provided shapefiles. Forest road construction and reconstruction analysis does not include transmission line ROW acreage.

[4] The Project would not change existing public road systems, access to recreational opportunities, or the 4-wheel drive section of West Pole Hill Road. Therefore, the Project would have no effect on recreational uses and experiences.

[5] Protected lands include the Flatiron Reservoir County Park, Chimney Hollow Open Space, Pinewood Reservoir County Park, Ramsay Shockey Open Space, Blue Mountain Bison Ranch, and a SLB Stewardship Trust parcel.

[6] Wetlands and waterbodies were determined from desktop analysis (U.S. Geological Survey [USGS] National Hydrography Dataset [NHD] data) and augmented with survey data where available. Ground surveys were completed early in the NEPA process during initial EA alternative development. Therefore, survey data were not collected for the full suite of alternatives. A full delineation of wetlands and waterbodies will be performed on the APA during final design and prior to construction. “Waterbodies” encompasses both perennial and intermittent streams.

[7] The soils analysis was based on a corridor of 200 feet for existing transmission lines centered on the ROW, 300 feet for new routing options, and 75 feet for underground variants. Some locations may have more than one soil characteristic.

[8] Data were determined based on a 110-foot width centered on the anticipated line and 75 feet for underground variants. Data also are based on Environmental Systems Research Institute, Inc. (ESRI) landcover data/Southwest Regional Gap Analysis Program (SWReGAP).

[9] New steel pole line has a lower electric field signature than the existing H-frame line because of taller structures and the cancellation effect of the double-circuit line.

[10] Magnetic fields of new steel pole line would be similar at the edge of the ROW compared to the existing H-frame line, but less when within the ROW. Additionally, magnetic fields differ on either side of the aboveground structures.

[11] Determinations based on analyses identified in Section 4.8.

[12] Acreage is based on the overlap of elk and mule deer winter range over the estimated construction surface disturbance within the ROW.

[13] Determinations based on analyses identified in Section 4.10.

[14] No federally listed wildlife species have potential to occur within the Project area as determined in the Project Biological Report (Cedar Creek Associates 2014) and further discussed in Section 3.10.1.

Abbreviations:

NA = not applicable or effects would not occur.

LP = low probability of species presence.

MAII = may adversely impact individuals, but not likely to result in a loss of viability on the Planning area, or cause a trend to federal listing.

NLAA = may affect, not likely to adversely affect.

NC = no change in population trend.

Table S-5 Measurement Indicators for Key and Other Issues, West Region Portions of Alternatives

Measurement Indicators for Issues	West Region, Alternative A	Variant A1	Variant A2	West Region Alternative B	West Region Alternative C	Variant C1	West Region Alternative D	West Region Only, APA	West Side No Action Alternative
Issue: ROW acquisition									
Acres of new ROW acquisition [1]	36	40	33	4	26	27	35	26	35
Acres of new ROW acquisition (National Forest System lands) [1]	8	8	8	4	4	4	8	4	8
Acres of ROW to be decommissioned [1]	51	57	56	14	40	39	1	40	1
Linear miles of ROW to be decommissioned[1]	4	6	6	4	5	5	0	5	0
Miles of land ownership crossed	Private - 2.7 USFS - 0.9 DOI - 0.0 SLB - 0.0 NCWCD - 0.0 County - 0.1	Private - 2.9 USFS - 0.9 DOI - 0.0 SLB - 0.0 NCWCD - 0.0 County - 0.0	Private - 3.0 USFS - 0.9 DOI - 0.0 SLB - 0.0 NCWCD - 0.0 County - 0.0	Private - 2.6 USFS - 1.4 DOI - 0.0 SLB - 0.0 NCWCD - 0.0 County - 0.0	Private - 2.6 USFS 1.4 DOI - 0.0 SLB - 0.0 NCWCD - 0.0 County - 0.0	Private - 2.7 USFS - 1.4 DOI - 0.0 SLB - 0.0 NCWCD - 0.0 County - 0.0	Private - 5.3 USFS - 2.3 DOI - 0.0 SLB - 0.0 NCWCD - 0.0 County - 0.1	Private - 2.6 USFS - 1.4 DOI - 0.0 SLB - 0.0 NCWCD – 0.0 County - 0.0	Private - 5.3 USFS - 2.3 DOI - 0.0 SLB - 0.0 NCWCD - 0.0 County - 0.1
Issue: effects on visual resources									
Existing SIO (National Forest System lands)	Moderate	Moderate	Moderate	Moderate	Moderate	Moderate	Moderate	Moderate	Moderate
Resulting SIO (National Forest System lands)	Very Low[2]	Very Low[2]	Very Low[2]	Very Low[2]	Very Low[2]	Very Low[2]	Moderate	Very Low[2]	Moderate
Issue: Forest road construction/reconstruction [3]									
Miles of new administrative road on National Forest System land for permanent access	0.8	0.8	0.8	0.5	0.5	0.5	1.4	0.5	1.4
Reconstruction of existing ML2 system road on National Forest System lands (miles)	0	0	0	0	0	0	0	0.0	0
Limited reconditioning of existing ML2 system road post-construction (miles)	0.7	0.7	0.7	1.6	2	2	1.6	2	1.6
Issue: recreational uses and experiences									
Long-term changes in recreation opportunities on National Forest System lands	No Changes due to Project[4]	No Changes due to Project[4]	No Changes due to Project[4]	No Changes due to Project[4]	Changes to four-wheel drive opportunities	Changes to four-wheel drive opportunities	No Changes due to Project[4]	No Changes due to Project[4]	No Changes due to Project[4]
Issue: protected lands									
No. protected lands crossed [5]	0	0	0	0	0	0	0	0	0
Issue: effects on infrastructure									
Conflicts with Upper Thompson Sanitation District	No	No	No	No	No	No	No	No	Limits facility expansion
CB Pole Hill Penstocks[8]	No	No	No	No	No	No	No	No	No
Issue: property values and economic effects									
No. of landowners affected by ROW acquisition [1]	16	6	17	1	3	26	12	3	12
New ROW	9	4	15	0	2	25	3	2	3
Expanded ROW	7	2	2	1	1	1	9	1	9
No. of landowners affected by both new ROW and expanded ROW acquisition [1]	12	5	15	1	3	25	9	3	9
Subdivisions affected by ROW acquisition (new or expanded ROW)	Park Hill	Park Hill	Park Hill	Park Hill	Park Hill	Park Hill	Park Hill	Park Hill	Park Hill
No. of landowners with ROW to be decommissioned	18	22	20	9	10	8	3	10	3
Businesses directly affected	NA	NA	NA	NA	NA: Four-wheel drive tour operator	NA: Four-wheel drive tour operator would	NA	NA	NA

Table S-5 Measurement Indicators for Key and Other Issues, West Region Portions of Alternatives

Measurement Indicators for Issues	West Region, Alternative A	Variant A1	Variant A2	West Region Alternative B	West Region Alternative C	Variant C1	West Region Alternative D	West Region Only, APA	West Side No Action Alternative
					would not be affected, due to a Project Design Change	not be affected, due to a Project Design Change			
Issue: cultural resources									
Number of NRHP-eligible historic sites potentially impacted	0	1	0	0	1	0	0	1	0
Issue: water resources, floodplains, and wetlands [6]									
Waterbodies Crossed	13	10	10	5	4	4	16	4	16
Wetlands Present	4	3	4	2	3	2	7	3	7
Waters of the U.S.	5	3	4	3	3	1	8	3	8
Issue: ROW clearing and maintenance									
Soil types in Analysis Area [7]									
Soils with shallow bedrock (within 60 inches of soil surface) (acres)	51	98	38	96	97	48	147	97	147
Low revegetation potential (acres)	27	92	32	63	63	21	89	63	89
Compaction prone (acres)	6	6	5	1	19	7	6	19	6
Water erodible (acres)	19	27	15	17	12	9	36	12	36
Vegetation types in ROW [8]									
Ponderosa pine woodland (acres)	29	38	32	31	34	30	61	34	61
Mixed conifer forest (acres)	4	8	4	20	14	14	24	14	24
Mountain shrub mosaic (acres)	7	3	6	1	3	4	8	3	8
Upland meadow, or upland meadow/wetland mosaic (acres)	7	1	6	1	1	5	6	1	6
Issue: electric and magnetic fields									
Electric fields at ROW edge (kV/m) [9]	0.12	0.12	0	0.12	0.12	0	0.34	0.12	0.34
Magnetic fields at each ROW edge (mG) [10]	5.2/1.8	5.2/1.8	0.05	5.2/1.8	5.2/1.8	0.05	5.2/5.3	5.2/1.8	5.2/5.3
Issue: effects on plants, wildlife, and fish									
Special Status Plants [11]									
Threatened and endangered	NLAA	NLAA	NLAA	NLAA	NLAA	NLAA	NLAA	NLAA	NLAA
Sensitive species	MAII	MAII	MAII	MAII	MAII	MAII	MAII	MAII	MAII
Species of local concern	LP	LP	LP	LP	LP	LP	LP	LP	LP
Big Game [12]									
Elk and Mule Deer Winter Range (acres)	20	21	21	23	21	23	33	21	33
Moose Winter Range (acres)	20	21	21	23	21	23	33	21	33
Special Status Wildlife [13]									
Threatened and endangered [14]	No Effect; None Present	No Effect; None Present	No Effect; None Present	No Effect; None Present	No Effect; None Present	No Effect; None Present	No Effect; None Present	No Effect; None Present	No Effect; None Present
Sensitive species	MAII	MAII	MAII	MAII	MAII	MAII	MAII	MAII	MAII
Management indicator species	NC	NC	NC	NC	NC	NC	NC	NC	NC

[1] The transmission line ROW acquisition footprint was revised based on a June 11, 2015 call between Carey Ashton (Western) and Steve Ensley (AECOM). Transmission ROW acreage does not include access roads.

[2] Would require lowering of SIO and documentation of change of SIO in MA 8.3 - Utility Corridor for this Project area, in accordance with Forest Plan Standard 154 and also documentation in the USFS ROD.

[3] All construction and reconstruction analyses were calculated with Western provided shapefiles. Forest road construction and reconstruction analysis does not include transmission line ROW acreage.

[4] The Project would not change existing public road systems, access to recreational opportunities, or the 4-wheel drive section of West Pole Hill Road. Therefore, the Project would have no effect on recreational uses and experiences.

[5] Protected lands include the Flatiron Reservoir County Park, Chimney Hollow Open Space, Pinewood Reservoir County Park, Ramsay Shockey Open Space, Blue Mountain Bison Ranch, and a SLB Stewardship Trust parcel.

[6] Wetlands and waterbodies were determined from desktop analysis (USGS NHD data) and augmented with survey data where available. Ground surveys were completed early in the NEPA process during initial EA alternative development. Therefore, survey data were not collected for the full suite of alternatives. A full delineation of wetlands and waterbodies will be performed on the APA during final design and prior to construction. “Waterbodies” encompasses both perennial and intermittent streams.

[7] The soils analysis was based on a corridor of 200 feet for existing transmission lines centered on the ROW, 300 feet for new routing options, and 75 feet for underground variants. Some locations may have more than one soil characteristic.

[8] Data were determined based on a 110-foot width centered on the anticipated line and 75 feet for underground variants. Data also are based on ESRI landcover data/SWReGAP.

[9] New steel pole line has a lower electric field signature than the existing H-frame line because of taller structures and the cancellation effect of the double-circuit line.

[10] Magnetic fields of new steel pole line would be similar at the edge of the ROW compared to the existing H-frame line, but less when within the ROW. Additionally, magnetic fields differ on either side of the aboveground structures.

[11] Determinations based on analyses identified in Section 4.8.

[12] Acreage is based on the overlap of elk and mule deer winter range over the estimated construction surface disturbance within the ROW.

[13] Determinations based on analyses identified in Section 4.10.

[14] No federally listed wildlife species have potential to occur within the Project area as determined in the Project Biological Report (Cedar Creek Associates 2014) and further discussed in Section 3.10.1.

Abbreviations:

NA = not applicable or effects would not occur.

LP = low probability of species presence.

MAII = may adversely impact individuals, but not likely to result in a loss of viability on the Planning area, or cause a trend to federal listing.

NLAA = may affect, not likely to adversely affect.

NC = no change in population trend.

Table S-6 Measurement Indicators for Key and Other Issues, East Region Portions of Alternatives

Measurement Indicators for Issues	East Region, Alternative A	East Region, Alternative B	East Region, Alternative C	East Region, Alternative D	East Region, APA	East Region, No Action Alternative
Issue: ROW acquisition						
Acres of new ROW acquisition [1]	59	17	31	40	17	40
Acres of new ROW acquisition (National Forest System lands) [1]	6	6	6	6	6	6
Acres of ROW to be decommissioned [1]	61	25	52	1	25	1
Linear miles of ROW to be decommissioned[1]	6	5	6	0	5	0
Miles of land ownership crossed	Private - 5.1 USFS - 0.6 DOI - 0.1 SLB - 0.0 NCWCD - 0.4 County - 0.5	Private - 2.7 USFS - 0.6 DOI - 0.1 SLB - 1.0 NCWCD - 0.8 County - 1.0	Private - 3.9 USFS - 0.6 DOI - 0.1 SLB - 0.0 NCWCD - 1.1 County - 1.1	Private - 6.2 USFS - 1.1 DOI - 0.2 SLB - 1.0 NCWCD - 1.5 County - 1.6	Private - 2.7 USFS - 0.6 DOI - 0.1 SLB - 1.0 NCWCD - 0.8 County - 1.0	Private - 6.2 USFS - 1.1 DOI - 0.2 SLB - 1.0 NCWCD - 1.5 County - 1.6
Issue: effects on visual resources						
Existing SIO (National Forest System lands)	Moderate	Moderate	Moderate	Moderate	Moderate	Moderate
Resulting SIO (National Forest System lands)	Very Low[2]	Very Low[2]	Very Low[2]	Moderate	Very Low[2]	Moderate
Issue: Forest road construction/reconstruction [3]						
Miles of new administrative road on National Forest System land for permanent access	0.0	0.0	0.0	0.5	0.0	0.5
Reconstruction of existing ML2 system road on National Forest System lands (miles)	0	0	0	0	0	0
Limited reconditioning of existing ML2 system road post-construction (miles)	1.4	1.4	1.4	1.4	1.4	1.4
Issue: recreational uses and experiences						
Long-term changes in recreation opportunities on National Forest System lands	No Changes due to Project[4]	No Changes due to Project[4]	No Changes due to Project[4]	No Changes due to Project[4]	No Changes due to Project[4]	No Changes due to Project[4]
Issue: protected lands						
No. protected lands crossed [5]	4	5	4	6	5	6
Issue: effects on infrastructure						
Conflicts with Upper Thompson Sanitation District	No	No	No	No	No	No
CB Pole Hill Penstocks[8]	No	No	No	No	No	No
Issue: property values and economic effects						
No. of landowners affected by ROW acquisition [1]	28	6	33	34	6	34
New ROW	8	2	12	10	2	10
Expanded ROW	20	4	21	24	4	24
No. of landowners affected by both new ROW and expanded ROW acquisition [1]	26	5	29	31	5	31
Subdivisions affected by ROW acquisition (new or expanded ROW)	Newell Lake	NA	Newell Lake	Newell Lake	NA	Newell Lake
No. of landowners with ROW to be decommissioned	26	38	26	14	38	14
Businesses directly affected	NA	NA	NA	NA	NA	NA
Issue: cultural resources						
Number of NRHP-eligible historic sites potentially impacted	3	3	3	4	3	4

Table S-6 Measurement Indicators for Key and Other Issues, East Region Portions of Alternatives

Measurement Indicators for Issues	East Region, Alternative A	East Region, Alternative B	East Region, Alternative C	East Region, Alternative D	East Region, APA	East Region, No Action Alternative
Issue: water resources, floodplains, and wetlands [6]						
Waterbodies Crossed	13	16	20	27	16	26
Wetlands Present	5	3	5	7	3	6
Waters of the U.S.	5	7	9	11	7	11
Issue: ROW clearing and maintenance						
Soil types in Analysis Area [7]						
Soils with shallow bedrock (within 60 inches of soil surface) (acres)	176	136	171	255	136	249
Low revegetation potential (acres)	1	1	1	14	1	14
Compaction prone (acres)	62	46	99	126	46	119
Water erodible (acres)	134	71	91	141	71	143
Vegetation types in ROW [8]						
Ponderosa pine woodland (acres)	58	36	46	67	36	67
Mixed conifer forest (acres)	3	0	0	1	0	1
Mountain shrub mosaic (acres)	18	23	26	47	23	47
Upland meadow, or upland meadow/wetland mosaic (acres)	9	16	15	33	16	33
Issue: electric and magnetic fields						
Electric fields at ROW edge (kV/m) [9]	0.12	0.12	0.12	0.34	0.12	0.34
Magnetic fields at each ROW edge (mG) [10]	5.2/1.8	5.2/1.8	5.2/1.8	5.2/5.3	5.2/1.8	5.2/5.3
Issue: effects on plants, wildlife, and fish						
Special Status Plants [11]						
Threatened and endangered	NLAA	NLAA	NLAA	NLAA	NLAA	NLAA
Sensitive species	MAII	MAII	MAII	MAII	MAII	MAII
Species of local concern	LP	LP	LP	LP	LP	LP
Big Game [12]						
Elk and Mule Deer Winter Range (acres)	37	35	36	50	35	50
Moose Winter Range (acres)	0	0	0	0	0	0
Special Status Wildlife [13]						
Threatened and endangered [14]	No Effect; None Present	No Effect; None Present	No Effect; None Present	No Effect; None Present	No Effect; None Present	No Effect; None Present
Sensitive species	MAII	MAII	MAII	MAII	MAII	MAII
Management indicator species	NC	NC	NC	NC	NC	NC

[1] The transmission line ROW acquisition footprint was revised based on a June 11, 2015 call between Carey Ashton (Western) and Steve Ensley (AECOM). Transmission ROW acreage does not include access roads.

[2] Would require lowering of SIO and documentation of change of SIO in MA 8.3 - Utility Corridor for this Project area, in accordance with Forest Plan Standard 154 and also documentation in the USFS ROD.

[3] All construction and reconstruction analyses were calculated with Western provided shapefiles. Forest road construction and reconstruction analysis does not include transmssion line ROW acreage.

[4] The Project would not change existing public road systems, access to recreational opportunities, or the 4-wheel drive section of West Pole Hill Road. Therefore, the Project would have no effect on recreational uses and experiences.

[5] Protected lands include the Flatiron Reservoir County Park, Chimney Hollow Open Space, Pinewood Reservoir County Park, Ramsay Shockey Open Space, Blue Mountain Bison Ranch, and a SLB Stewardship Trust parcel.

[6] Wetlands and waterbodies were determined from desktop analysis (USGS NHD data) and augmented with survey data where available. Ground surveys were completed early in the NEPA process during initial EA alternative development. Therefore, survey data were not collected for the full suite of alternatives. A full delineation of wetlands and waterbodies will be performed the APA during design and prior to construction. “Waterbodies” encompasses both perennial and intermittent streams.

[7] The soils analysis was based on a corridor of 200 feet for existing transmission lines centered on the ROW, 300 feet for new routing options, and 75 feet for underground variants. Some locations may have more than one soil characteristic.

[8] Data were determined based on a 110-foot width centered on the anticipated line and 75 feet for underground variants. Data also are based on ESRI landcover data/SWRegap.

[9] New steel pole line has a lower electric field signature than the existing H-frame line because of taller structures and the cancellation effect of the double-circuit line.

[10] Magnetic fields of new steel pole line would be similar at the edge of the ROW compared to the existing H-frame line, but less when within the ROW. Additionally, magnetic fields differ on either side of the aboveground structures.

[11] Determinations based on analyses identified in Section 4.8.

[12] Acreage is based on the overlap of elk and mule deer winter range over the estimated construction surface disturbance within the ROW.

[13] Determinations based on analyses identified in Section 4.10.

[14] No federally listed wildlife species have potential to occur within the Project area as determined in the Project Biological Report (Cedar Creek Associates 2014) and further discussed in Section 3.10.1.

<u>Abbreviations:</u>

NA = not applicable or effects would not occur.

LP = low probability of species presence.

MAII = may adversely impact individuals, but not likely to result in a loss of viability on the Planning area, or cause a trend to federal listing.

NLAA = may affect, not likely to adversely affect.

NC = no change in population trend.

Table S-7 Comparison of Alternative Effects [1]

Resource	Alternative A	Alternative A1	Alternative A2	Alternative B	Alternative C	Alternative C1	Alternative D	APA	No Action Alternative
Soils	Potential impacts to soils include compaction and traffic ruts, erosion, and contamination. Compaction and erosion impacts would be minimized through SCPs. Soil contamination would be avoided or mitigated through adherence to SCPs and applicable permit requirements.	Potential impacts would be the same as Alternative A. Acres of impacted soil types would be the same as Alternative A.	The nature of potential impacts would be the same as Alternative A. Fewer acres would be affected than Alternative A. More soil disturbance would result from trenching, possibly reducing soil productivity.	Potential impact factors would be the same as Alternative A. Acres of impacted soil types would be the same as Alternative A2.	The nature of potential impacts would be similar to Alternative A. More acres of bedrock would be affected. Reconstruction along USFS Road 247.D would reduce erosion associated with this ML2 road and have long-term beneficial effects for soils on National Forest System lands.	Potential impact factors would be the same as Alternative A. Soil disturbance acreages would be similar to Alternative C. More soil disturbance would result from trenching, possibly reducing soil productivity. Reconstruction along USFS Road 247.D would reduce erosion associated with this ML2 road and have long-term beneficial effects for soils on National Forest System lands.	Potential impact factors would be the same as Alternative A. The greatest acreage of soils and bedrock would be affected under Alternative D.	Potential impact factors would be the same as Alternative A. Soils having low revegetation potential would be more extensive than Alternative A, the same as Alternative C, and less than Alternatives B and D. The extent of compaction-prone or water-erodible soils would be much less than Alternatives A, C, or D. Less newly acquired ROW would be needed than for Alternatives A, C, or D, reducing the potential for new soil impacts.	Natural causes and human activities would continue to affect soil resources at current levels. Impact characteristics associated with relocation of the line in part of the Newell Lake View development would be similar to Alternative A.
Water Resources and Floodplains	Impacts to surface water quantity and quality would be minor to negligible due to implementation of SCPs and compliance with permit provisions. Impacts to groundwater resources would be negligible. Measurable effects would be avoided within the Federal Emergency Management Agency (FEMA)-designated floodplain.	Compared with Alternative A, further potential for changes in runoff rates, flow turbidity and sedimentation, and spills or leaks would occur in areas of new access roads and ROW construction. Impacts to surface water quantity and quality or groundwater resources would be minor to negligible due to implementation of SCPs and compliance with permit provisions. Measurable effects would be avoided within the FEMA-designated floodplain.	Variant A2 would have impacts similar to Variant A1. In addition, construction for the underground portion of the ROW may encounter groundwater; if this occurred, it would be addressed in compliance with state permit approvals.	Potential impacts would generally be of the same type as Alternative A. Additional potential for impacts to existing runoff conditions, or flow turbidity and sedimentation would occur in the steep terrain near Meadowdale Ranch and Ravencrest areas. Potential impacts would be minor to negligible, and would be addressed similar to Alternative A. The FEMA-designated floodplain would be avoided.	Potential impacts would generally be the same as Alternative B. An area that may have shallow groundwater occurs along Alternative C at the east side of Pinewood Reservoir. Impacts to surface water or groundwater quantity and quality would be minor to negligible through implementation of SCPs and compliance with permit provisions.	Potential impacts would be the same as for Alternative C. Shallow groundwater also may be encountered where deeper excavation could occur for underground construction along the western 2.7 miles of the ROW.	The potential for impacts from ROW use and construction would be similar to Alternatives A and B. The reroute in the vicinity of Pinewood Reservoir would have the potential for shallow groundwater impacts similar to Alternative C. Implementation of SCPs and compliance with permit provisions would reduce impacts to minor or negligible levels.	Impacts to water resources quantity and quality would be minor to negligible due to implementation of SCPs and compliance with permit provisions. This alternative would cross fewer waterbodies and wetlands than any alternative except Alternative B. Areas of potential shallow groundwater in the Pinewood Reservoir locale would be avoided. The least amount of new transmission line ROW acquisition would occur; reducing the potential for increased runoff, flow turbidity, sedimentation, or impacts from spills during new disturbance.	Potential impacts to surface or groundwater quantity and quality would be similar to Alternatives A, B, and D, but would be spread out in space and time. Implementation of SCPs and compliance with permit provisions would limit impacts to minor or negligible levels. Negligible impacts to floodplains would occur.

Table S-7 Comparison of Alternative Effects [1]

Resource	Alternative A	Alternative A1	Alternative A2	Alternative B	Alternative C	Alternative C1	Alternative D	APA	No Action Alternative
Wetlands and Waters of the U.S.	Agency policy is to avoid these sensitive areas where possible. Where disturbance cannot be avoided, impacts to drainage, adapted vegetation, and scarce habitats could occur. These effects would be avoided or mitigated by implementation of SCPs and EPMs.	The nature of impacts, their potential extent, and corresponding agency practices would be similar to Alternative A.	The nature of impacts and corresponding agency practices would be similar to Alternative A. Depending on underground construction techniques through wetlands and Waters of the U.S., the extent of impacts could be somewhat more or less than Alternative A.	The nature of impacts and corresponding agency practices would be similar to Alternative A. The potential for disturbing wetlands or Waters of the U.S. would be much less for Alternative B than Alternative A.	The nature of impacts and corresponding agency practices would be similar to Alternative A. The potential for disturbing wetlands or Waters of the U.S. would be similar to Alternative A.	The nature of impacts and corresponding agency practices would be similar to Alternative A. Depending on underground construction techniques through wetlands and Waters of the U.S., the extent of impacts could be somewhat more or less than Alternative A.	The nature of impacts and corresponding agency practices would be similar to Alternative A. The potential for disturbing wetlands or Waters of the U.S. would be much greater for Alternative D than Alternative A.	The nature of impacts and corresponding agency practices would be similar to Alternative A. The potential for disturbing wetlands or Waters of the U.S. would be slightly less than Alternative A. It is expected that all wetlands would be avoided by the final design.	The nature of impacts and corresponding agency practices would be similar to Alternative A. Fewer impacts would be anticipated than for other alternatives because of decreased construction disturbance.
Vegetation	Ponderosa pine, mixed conifer forest, mountain shrub mosaic, and upland meadow communities would be impacted by Project disturbance. Effects would include vegetation trampling, removal, or incidental disturbance. Approximately 70 percent of disturbance would occur in ponderosa pine communities.	The nature and extent of potential impacts to vegetation types would be the same as Alternative A. Slightly more disturbance would occur in the ponderosa pine community.	Potential impacts to vegetation types would be similar to Alternative A.	Potential impacts to vegetation types would be similar to Alternative A, but slightly less extensive. Fewer ponderosa pine woodlands would be affected (approximately 55 percent) and more mixed conifer forest, mountain shrub mosaic, and upland meadows would be affected.	Potential impacts to vegetation types would be similar to Alternative A, although slightly less ponderosa pine woodlands would be affected and more mixed conifer forest, mountain shrub mosaic, and upland meadows would be affected.	Potential impacts to vegetation types would be similar to Alternative A, although slightly less ponderosa pine woodlands and mixed conifer forest would be affected and more mountain shrub mosaic and upland meadows would be affected.	The nature of potential impacts to vegetation types would be similar to Alternatives A, B, and C, but the overall acreage of potential impacts would be much more extensive. Approximately 60 percent of the greater disturbance area would occur in ponderosa pine woodlands.	Potential impacts to vegetation types would be similar to Alternative A but slightly less extensive. Of the smaller acreage, fewer ponderosa pine woodlands would be affected (approximately 65 percent) and more mixed conifer forest, mountain shrub mosaic, and upland meadows would be affected.	Potential impacts to all vegetation types would be similar to Alternative D.
Special Status and Sensitive Plant Species	No federally listed species are found along Alternative A. Due to limited distribution of federally listed species and low quality of habitat, no impacts to these species would be expected. Potential impacts to sensitive plant species and species of concern would be minor and short-term due to limited surface disturbance in the ROW, and reclamation of disturbed areas.	Potential impacts would be the same as Alternative A.	Potential impacts would be the same as Alternative A.	Due to limited distribution of federally listed species and low quality of habitat, no impacts to these species would be expected. Potential impacts to sensitive plant species and species of concern would be minor and short-term due to limited surface disturbance in the ROW, and reclamation of disturbed areas.	Potential impacts would be the same as Alternative A.	Potential impacts would be the same as Alternative A.	Due to limited distribution of federally listed species and low quality of habitat, no impacts to these species would be expected. Potential impacts to sensitive plant species and species of concern would be minor and short-term due to limited surface disturbance in the ROW, and reclamation of disturbed areas.	Due to limited distribution of federally listed species and low quality of habitat, no impacts to these species would be expected. Potential impacts to sensitive plant species and species of concern would be minor and short-term due to limited surface disturbance in the ROW, and reclamation of disturbed areas	Due to low quality of habitat and reduced surface disturbance, no impacts to federally listed species would be anticipated. Potential impacts to sensitive plant species and species of concern would be minor and short-term due to limited surface disturbance in the ROW, and reclamation of disturbed areas.
Wildlife Habitat	Elk and mule deer winter range, and moose winter range habitat would be affected by this alternative.	Elk and mule deer winter range, and moose winter range habitat would be affected by this alternative.	Elk and mule deer winter range, and moose winter range habitat would be affected by this alternative. The extent of impacts due would be somewhat greater than Alternative A.	Elk and mule deer winter range, and moose winter range habitat would be affected by this alternative. The nature and extent of impacts would be similar to Alternative A.	Elk and mule deer winter range, and moose winter range habitat would be affected by this alternative. The nature and extent of impacts would be similar to Alternatives A and B.	Elk and mule deer winter range, and moose winter range habitat would be affected by this alternative. The extent of impacts would be somewhat greater than Alternative A.	Elk and mule deer winter range, and moose winter range habitat would be affected by this alternative. The extent of impacts would be much greater than Alternatives A, B, or C.	Elk and mule deer winter range, and moose winter range habitat would be affected by this alternative. The nature and extent of impacts would be similar to Alternatives A, B, and C.	Acres of big-game habitat impacted would be similar to Alternative D.

Table S-7 Comparison of Alternative Effects [1]

Resource	Alternative A	Alternative A1	Alternative A2	Alternative B	Alternative C	Alternative C1	Alternative D	APA	No Action Alternative
Raptors and Other Birds	Implementation of EPMs, as well as seasonal restrictions to prevent impacts to raptors and migratory birds potentially would minimize direct impacts. Additionally, based on conductor placement and orientation, electrocution would not pose a hazard to bird species. Remaining impacts (e.g., loss of habitat) are anticipated to be minor.	Potential impacts would be the same as Alternative A. There would be no risk of raptor collisions where the transmission line would be constructed underground.	Potential impacts would be the same as Alternative A. There would be no risk of raptor collisions where the transmission line would be constructed underground.	Potential impacts would be the same as Alternative A.	Potential impacts would be the same as Alternative A.	Potential impacts would be the same as Alternative A. There would be reduced risk of raptor collisions where the transmission line would be constructed underground.	Potential impacts would be the same as Alternative A.	Potential impacts would be the same as Alternatives A, B, and C.	Displacement of upland game birds, raptors, and other birds as a result of increased human activity during maintenance activities would be short-term and minor. Relocation of the line would result in potential impacts similar to Alternative A.
Special Status and Sensitive Wildlife Species Habitat Disturbance	Vegetation communities in the ROW that support special status and sensitive wildlife species would be affected.	Vegetation communities in the ROW that support special status and sensitive wildlife species would be affected at the same level as Alternative A	Vegetation communities in the ROW that support special status and sensitive wildlife species would be affected at approximately the same level as Alternative A.	Vegetation communities in the ROW that support special status and sensitive wildlife species would be affected at a greater level than Alternative A.	Vegetation communities in the ROW that support special status and sensitive wildlife species would be affected at approximately the same level as Alternative A.	Vegetation communities in the ROW that support special status and sensitive wildlife species would be affected at approximately the same level as Alternative A.	Much greater extent of vegetation communities in the ROW that support special status and sensitive wildlife species would be affected than any other alternative.	Vegetation communities in the ROW that support special status and sensitive wildlife species would be affected at approximately the same level as Alternative A	Fewer acres of vegetation communities in the ROW that support special status and sensitive wildlife species would be affected than any action alternative.
Land Use and Recreation Land Use	Long-term adverse impacts to land use from the acquisition of new or expanded ROW would range from negligible to moderate depending on the location and ownership of the acquired ROW. Beneficial effects where existing ROW would be decommissioned.	Impacts are similar to A; however, Variant A1 would require slightly more acres of new ROW.	Impacts are similar to A; however, Variant A2 would require slightly less acres of new ROW.	Impacts are similar to A; however, Alternative B requires the fewest acres of ROW acquisition.	Impacts are similar to A; however, Variant A1 would require less acres of new ROW.	Impacts are similar to A; however, Variant C1 would require less acres of new ROW.	The nature of potential impacts would be similar to Alternative A; however, Alternative D would maintain two ROWs and therefore requires the most ROW acquisition. The beneficial effects of ROW consolidation would not be realized under this alternative.	The APA would require much less acquisition of new ROW than any other alternative except Alternative B. The number of landowners with ROW to be decommissioned would be slightly greater than Alternatives A or B, and much greater than Alternatives C, D, or the No Action Alternative.	Existing ROWs would be expanded to a minimum width of 75 feet. New ROW would be acquired to relocate the line from Newell Lake View subdivision (through which there is inadequate ROW). The beneficial effects of ROW consolidation would not be realized.

Table S-7 Comparison of Alternative Effects [1]

Resource	Alternative A	Alternative A1	Alternative A2	Alternative B	Alternative C	Alternative C1	Alternative D	APA	No Action Alternative
Recreation	Potential short- and long-term impacts to recreation from access roads, staging areas, and construction and maintenance activities would range from negligible to moderate depending on the location and timing of activities. The long-term recreational experience would be enhanced in areas where existing transmission line would be decommissioned.	Potential impacts would be the same as Alternative A.	Potential impacts would be the same as Alternative A.	Short-term recreation opportunities on the Besant Point Trail could be affected depending on the timing of construction. Long-term impacts would include effects to the four-wheel drive recreational setting on West Pole Hill Road caused by the steel structures. Any potential change to the Recreation Opportunity Spectrum classification resulting from the new structures would result in a Forest Service Plan Amendment. Other potential impacts to recreation would be similar to Alternative A. Other potential impacts to recreation would be similar to Alternative A.	Moderate short- and long-term impact to the recreation setting and recreation facilities would occur along the eastern side of Pinewood Reservoir County Park. Other potential impacts to recreation would be similar to Alternative A. four-wheel drive recreation opportunities would be significantly adversely impacted on sections of USFS Road 122 that would be reconstructed. Reconstruction on sections of USFS Road 122 also would result in adverse and beneficial effects to dispersed recreation.	Moderate short- and long-term impact to the recreation setting and recreation facilities would occur along the eastern side of Pinewood Reservoir County Park. Other potential impacts to recreation would be similar to Alternative A. Four-wheel drive recreation opportunities would be significantly adversely impacted on sections of USFS Road 122 that would be reconstructed. Reconstruction on sections of USFS Road 122 also would result in adverse and beneficial effects to dispersed recreation.	Moderate short- and long-term impact to the recreation settings would occur along the eastern side of Pinewood Reservoir County Park. Other potential impacts to recreation would be similar to Alternative A. The beneficial effects of ROW consolidation would not be realized under this alternative.	Potential impacts to recreation would be similar to Alternative A. Under the APA, the four-wheel drive portion of USFS Road 122 would not be reconstructed resulting in no significant adverse impacts to recreation resources.	Moderate short- and long-term impact to recreation settings along would occur on the east side of Pinewood Reservoir County Park. Negligible to minor adverse effects to recreation settings would occur where additional ROW would need to be acquired. The beneficial effects of ROW consolidation would not be realized under this alternative.
Visual Resources	New, taller structures and associated disturbance would result in short- and long-term adverse effects ranging from minor to moderate with localized strong visual changes. Long-term beneficial effects would occur where the South Line would be removed, such as within the Newell Lake View subdivision. Moderate adverse effects would occur from new access roads and vegetation management	Potential impacts would be the same as Alternative A, except for along 0.5 mile of U.S. Highway 36 where the adverse effect would be greater.	Potential impacts would be the same as Alternative A, except for the underground segment near Estes Park which would result in no overhead transmission line structures, but may produce a more visually noticeable cleared ROW.	Incrementally adverse effects would occur to Chimney Hollow Open Space, Pinewood Lake, Meadowdale Hills and Ravencrest subdivisions, and U.S. Highway 36. Conversely, beneficial effects would occur to the Newell Lake View subdivision and the valley between Mount Pisgah and Mount Olympus as seen from the Estes Valley as a result of abandonment of an entire ROW. Other potential impacts to scenic resources would be similar to Alternative A.	Incrementally adverse effects would occur to Chimney Hollow Open Space, and Meadowdale Hills and Ravencrest subdivisions, and along 0.75 mile of U.S. Highway 36. Conversely, beneficial effects would occur to the Newell Lake View subdivision and the valley between Mount Pisgah and Mount Olympus as seen from the Estes Valley as a result of abandonment of an entire ROW. Other potential impacts to scenic resources would be similar to Alternative A.	Potential impacts would be the same as Alternative C, except for the underground segment near Estes Park which would result in no overhead transmission line structures, but may produce a more visually noticeably cleared ROW.	Potential long-term impacts would be the similar as the No Action Alternative. Beneficial changes would result within the Newell Lake View subdivision. Moderate adverse effects would occur from new access roads and vegetation management similar to Alternative A.	Incremental adverse effects would occur to Chimney Hollow Open Space, Pinewood Lake, Meadowdale Hills and Ravencrest subdivisions, and along U.S. Highway 36. Conversely, beneficial effects would occur to the Newell Lake View subdivision and the valley between Mount Pisgah and Mount Olympus as seen from the Estes Valley as a result of abandonment of an entire ROW. Other potential impacts to scenic resources would be similar to Alternative A.	Minor adverse to moderate impacts from visible portions of the two existing transmission lines and ongoing structure replacement and vegetation maintenance activities would continue similar to existing conditions. Beneficial changes would result within the Newell Lake View subdivision.

Table S-7 Comparison of Alternative Effects [1]

Resource	Alternative A	Alternative A1	Alternative A2	Alternative B	Alternative C	Alternative C1	Alternative D	APA	No Action Alternative
Socioeconomics and Community Resources	Beneficial effects associated with job opportunities and to the economic base would be temporary and minor. Minor decreases in property values as a result of taller structures, and conversely minor increases in property values where structures would be removed. No environmental justice concerns were identified.	Potential impacts would be the same as Alternative A.	Estimated 80-year life cycle costs would increase approximately 120 percent relative to Alternative A. Some potential for minor, short-term decreases in property values as a result of taller structures, and conversely minor increases in property values where structures would be removed. Residences near the underground portion of the variant may experience a minor increase in property values. No environmental justice concerns were identified.	Potential impacts would be the same as Alternative A. Estimated 80-year life cycle costs would be reduced to approximately 92 percent of Alternative A. Some potential for minor, short-term decreases in property values as a result of taller structures, and conversely minor increases in property values where structures would be removed. No environmental justice concerns were identified.	Potential 80-year life cycle costs would be similar to Alternative A. Reconstruction of Pole Hill Road would result in significant short-term and long-term effects to a USFS permittee that leads four-wheel drive tours in the West Pole Hill area. Some potential for minor, short-term decreases in property values as a result of taller structures, and conversely minor increases in property values where structures would be removed. No environmental justice concerns were identified.	Estimated 80-year life cycle costs would increase approximately 108 percent relative to Alternative A. Reconstruction of Pole Hill Road would result in significant short-term and long-term effects to a USFS permittee that leads four-wheel drive tours in the West Pole Hill area. Some potential for minor, short-term decreases in property values as a result of taller structures, and conversely minor increases in property values where structures would be removed. Residences near the underground portion of the variant may experience a minor increase in property values. No environmental justice concerns were identified.	Beneficial effects associated with job opportunities and to the economic base would be temporary and minor. Minor decreases in property values as a result of taller structures. Alternative D would maintain two ROWs and the beneficial effects to property values from ROW decommissioning would not be realized, except where the line would be relocated from Newell Lake View subdivision to Pole Hill Road. Estimated 80-year life cycle costs would increase approximately 170 percent relative to Alternative A. No environmental justice concerns were identified.	Potential impacts would be similar to Alternative A. Estimated 80-year life cycle costs would be reduced to approximately 89 percent of Alternative A. Some potential for minor, short-term decreases in property values as a result of taller structures, and conversely minor increases in property values where structures would be removed. No environmental justice concerns were identified.	Potential impacts include increased maintenance costs as existing lines age and require more maintenance. The No Action Alternative would maintain two ROWs and the beneficial effects to property values from ROW decommissioning would not be realized, except where the line would be relocated from Newell Lake View subdivision to Pole Hill Road. Estimated 80-year life cycle costs would increase approximately 190 percent relative to Alternative A. No environmental justice concerns were identified.
Electrical Effects and Human Health	Effects associated with noise, radio and television interference, and induced current and voltage, as well as effects to cardiac pacemakers would be negligible; SCPs would further minimize noise and induced current and voltage. Electric and magnetic field levels would be less than the existing transmission lines. Health effects would be similar to or less than existing lines.	Potential effects would be the same as Alternative A.	Potential effects would be the same as Alternative A, except that electrical fields would be blocked by the soil where the transmission line is constructed underground and would not be a concern. Additionally, magnetic fields would be higher than those produced by aboveground lines, but would still represent a negligible impact.	Potential effects would be the same as Alternative A.	Potential effects would be the same as Alternative A.	Potential effects would be the same as Alternative A, except that electrical fields would be blocked by the soil where the transmission line is constructed underground and would not be a concern. Additionally, magnetic fields would be higher than those produced by aboveground lines, but would still represent a negligible impact.	Potential effects would be the same as Alternative A.	Potential effects would be the same as Alternative A.	Electric fields at the ROW edge, and magnetic fields within the ROW, would be higher than for action alternatives, although the potential effects would be the similar to Alternative A.

Table S-7 Comparison of Alternative Effects [1]

Resource	Alternative A	Alternative A1	Alternative A2	Alternative B	Alternative C	Alternative C1	Alternative D	APA	No Action Alternative
Cultural Resources	A total of 6 historic properties, 2 contributing elements of the CBT Project Historic District, and 2 unevaluated sites have been documented along this alternative. Unavoidable adverse effects would be minimized through a treatment plan, and through implementation of SCPs.	A total of 6 historic properties, 2 contributing elements of the CBT Project Historic District, and 2 unevaluated sites have been documented along this alternative. Minimization of adverse effects would be the same as Alternative A.	A total of 6 historic properties, 2 contributing elements of the CBT Project Historic District, and 2 unevaluated sites have been documented along this alternative. Minimization of adverse effects would be the same as Alternative A.	A total of 8 historic properties and 2 contributing elements of the CBT Project Historic District have been documented along this alternative. Minimization of adverse effects would be the same as Alternative A.	A total of 9 historic properties and 2 contributing elements of the CBT Project Historic District have been documented along this alternative. Minimization of adverse effects would be the same as Alternative A.	A total of 9 historic properties and 2 contributing elements of the CBT Project Historic District have been documented along this alternative. Minimization of adverse effects would be the same as Alternative A.	A total of 12 historic properties, 4 contributing elements of the CBT Project Historic District, and 2 unevaluated sites have been documented along this alternative. Minimization of adverse effects would be the same as Alternative A.	Potential impacts would be similar to Alternatives B and C. Minimization of adverse effects would be the same as Alternative A.	A total of 12 historic properties, 4 contributing elements of the CBT Project Historic District, and 1 unevaluated site have been documented along this alternative. At this time, no inventories have been conducted along the line that would be relocated.
Transportation	Potential direct and indirect impacts would be less than significant due to low levels of Project-generated traffic. This alternative requires 1.3 miles of temporary access and 1.3 miles of permanent access on National Forest System land.	Potential impacts would be similar to Alternative A.	Potential impacts would be similar to Alternative A.	Potential direct and indirect impacts would be less than significant due to low levels of Project-generated traffic. This alternative requires 1.7 miles of temporary access and 0.8 mile of permanent access on National Forest System land.	Potential direct and indirect impacts would potentially be less than significant due to creation of road conditions that would require frequent and recurring roadway repair and maintenance low levels of Project-generated traffic. This alternative requires 1.7 miles of temporary access and 0.8 mile of permanent access on National Forest System land. Increased recreational traffic on Pole Hill Road under Alternative C resulting from the reconstruction of USFS Road 122 would potentially create road conditions that would require frequent and recurring roadway repair and maintenance, causing significant adverse impacts to transportation.	Potential direct and indirect impacts would potentially be less than significant due to creation of road conditions that would require frequent and recurring roadway repair and maintenance low levels of Project-generated traffic. This alternative requires 1.7 miles of temporary access and 0.8 mile of permanent access on National Forest System land. Increased recreational traffic on Pole Hill Road under Alternative C1 resulting from the reconstruction of USFS Road 122 would potentially create road conditions that would require frequent and recurring roadway repair and maintenance, causing significant adverse impacts to transportation.	Potential direct and indirect impacts would be less than significant due to low levels of Project-generated traffic. This alternative requires 2.5 miles of permanent access on National Forest System land.	Potential impacts from miles of temporary and permanent access on National Forest System land would be similar to Alternative B and C; however, under the APA, the four-wheel drive portion of USFS Road 122 would not be reconstructed resulting in no significant adverse impacts.	Potential direct and indirect impacts would be less than significant due to low levels of Project-generated traffic. There would be no new temporary or permanent access authorized on National Forest System lands.

[1] Note: Impacts summarized in this table were determined as described in Chapter 4.0 with implementation of design criteria, SCPs, and EPMs.

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Acronyms and Abbreviations

°F	degree Fahrenheit
µg/m^3	microgram per cubic meter
AAQS	Ambient Air Quality Standards
ACSR	Aluminum Conductor Steel-Reinforced
AM	amplitude modulated
amsl	above mean sea level
ANSI	American National Standard Institute
APA	Agency Preferred Alternative
APCD	Air Pollution Control Division
APE	Area of Potential Effect
APLIC	Avian Power Line Interaction Committee
ARP	Arapaho and Roosevelt National Forests and Pawnee National Grassland
ATV	all-terrain vehicle
BCC	Birds of Conservation Concern
BOR	Bureau of Reclamation
CAA	Clean Air Act
CBT	Colorado-Big Thompson
CDA	Colorado Department of Agriculture
CDPHE	Colorado Department of Public Health and Environment
CDWR	Colorado Division of Water Resources
CEQ	Council on Environmental Quality
CFR	Code of Federal Regulations
CNHP	Colorado Natural Heritage Program
CO	carbon monoxide
CO_2e	carbon dioxide equivalent
CPW	Colorado Parks and Wildlife
CWA	Clean Water Act
DAU	Data Analysis Unit
dBA	decibel (A-weighted)
DOE	U.S. Department of Energy
DOI	U.S. Department of the Interior
EA	environmental assessment
EIS	environmental impact statement
E-LS	Estes-Lyons
EMF	electric and magnetic fields
EO	Executive Order
EPA	U.S. Environmental Protection Agency
E-PH	Estes-Pole Hill
ESA	Endangered Species Act
FEMA	Federal Emergency Management Agency
FM	frequency modulated
F-PH	Flatiron-Pole Hill
FR	Federal Register

FRCC	Fire Regime Condition Class
FSH	Forest Service Handbook
FSM	Forest Service Manual
GHG	greenhouse gas
GPS	Global Positioning System
HUC	hydrologic unit code
kcmil	thousand circular mil
KOP	key observation point
kV	kilovolt
kV/m	kilovolt per meter
MBTA	Migratory Bird Treaty Act
mG	milligauss
MIS	Management Indicator Species (Forest Service)
ML2	maintenance level 2
NAAQS	National Ambient Air Quality Standards
NCWCD	Northern Colorado Water Conservancy District
NDIS	Natural Diversity Information Source
NEPA	National Environmental Policy Act
NERC	North American Electric Reliability Corporation
NESC	National Electrical Safety Code
NFMA	National Forest Management Act
NHPA	National Historic Preservation Act
NO_2	nitrogen dioxide
NOI	Notice of Intent
NO_X	oxides of nitrogen
NPDES	National Pollutant Discharge Elimination System
NRCS	Natural Resources Conservation Service
NRHP	National Register of Historic Places
O_3	ozone
OHV	off-highway vehicle
OHWM	ordinary high water mark
OSHA	Occupational Safety and Health Administration
Pb	lead
PM	particulate matter
PM_{10}	particulate matter aerodynamic diameter of 10 microns or less
$PM_{2.5}$	particulate matter aerodynamic diameter of 2.5 microns or less
ppb	parts per billion
ppm	parts per million
PSD	Prevention of Significant Deterioration
ROD	Record of Decision
ROS	Recreation Opportunity Spectrum
ROW	right-of-way
SCP	standard construction practice
SFHA	Special Flood Hazard Area
SHPO	State Historic Preservation Office

SIO	Scenic Integrity Objective
SIP	State Implementation Plan
SLB	State Land Board (Colorado)
SMS	Scenery Management System
SO_2	sulfur dioxide
SWReGAP	Southwest Regional Gap Analysis Project
TCP	traditional cultural properties
tpy	tons per year
U.S.	United States
U.S.C.	United States Code
USACE	U.S. Army Corps of Engineers
USDA	U.S. Department of Agriculture
USFS	U.S. Forest Service
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
VOC	volatile organic compound
Western	Western Area Power Administration

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1.0 Introduction

Western Area Power Administration (Western), a power marketing administration within the United States (U.S.) Department of Energy (DOE), is proposing to rebuild and upgrade two 115-kilovolt (kV) single-circuit transmission lines between Flatiron Substation west of Flatiron Reservoir and the intersection of Mall Road and U.S. Highway 36 in Estes Park, Larimer County, Colorado (hereafter defined as the Project). The Project is subject to the environmental review process mandated under the National Environmental Policy Act (NEPA) of 1969.

This Environmental Impact Statement (EIS) analyzes the environmental consequences of seven action alternatives to rebuild and upgrade the existing 115-kV transmission lines, and the no-action alternative. Western is the lead Federal agency for the NEPA document. The U.S. Forest Service (USFS) has jurisdiction over National Forest System lands crossed by the transmission lines, is a cooperating agency for the EIS, and will be basing its own decision on this EIS.

This EIS has been prepared in accordance with the NEPA of 1969, as amended (42 United States Code [U.S.C.] Section 4321 et seq*.)*, the Council on Environmental Quality (CEQ) regulations for implementing the procedural provisions of NEPA (40 Code of Federal Regulations [CFR] Parts 1500-1508), and DOE and USFS NEPA procedures (10 CFR Parts 1021 and 1022, and 36 CFR Part 220).

1.1 Project Location

The Project is located in Larimer County, Colorado, and extends between Lake Estes on the east side of Estes Park and Western's Flatiron Substation, west of Flatiron Reservoir. The Project area is situated east of the community of Estes Park and west of the Town of Loveland. Major transportation corridors are U.S. Highways 36 and 34, which provide access between Front Range communities to the east and Rocky Mountain National Park to the west of the Project area. The Project area includes private lands in Larimer County, and public lands administered by the U.S. Department of the Interior (DOI), USFS, the Colorado State Land Board, Northern Colorado Water Conservancy District (NCWCD) and Larimer County. **Figure 1.2-1** shows the general location of the Project.

1.2 Background

Western's mission is to market and deliver renewable, reliable, cost-based Federal hydroelectric power and related services. Western undertakes a variety of construction projects, either on its own or in partnership with other utilities or power customers. Western owns, operates, and maintains two single-circuit transmission lines between the Estes Park and Flatiron Substations. Prior to the formation of the DOE, the DOI's Bureau of Reclamation (BOR) constructed and maintained the two existing transmission lines as part of the Colorado-Big Thompson (CBT) project. The lines were constructed to transmit electricity from hydropower generation sources within the CBT project. After the formation of the DOE and Western in 1977, ownership, operation, and maintenance of the transmission lines transferred from the BOR to Western.

The Estes-Lyons Tap (E-LS) is the more northern of the two lines and will be referred to in the remainder of this document as the North Line, except where the acronym gives historical context. The second, more southerly line consists of the Estes-Pole Hill (E-PH) and Flatiron-Pole Hill (F-PH) lines which connect the Pole Hill Substation to Estes Park and the Flatiron Substation, respectively (**Figure 1.2-1**). The two south segments will be referred to in this document as the South Line, except where the acronym gives historical context. Both existing transmission lines are 115-kV single-circuit lines constructed on wood pole H-frame structures. The South Line is 14.5 miles in length and the North Line is 14.1 miles long. Western's project only encompasses the single-circuit wood-pole transmission lines from the east side of the Estes causeway and does not involve the portions of the double-circuit transmission lines located on steel lattice structures along the Estes causeway.

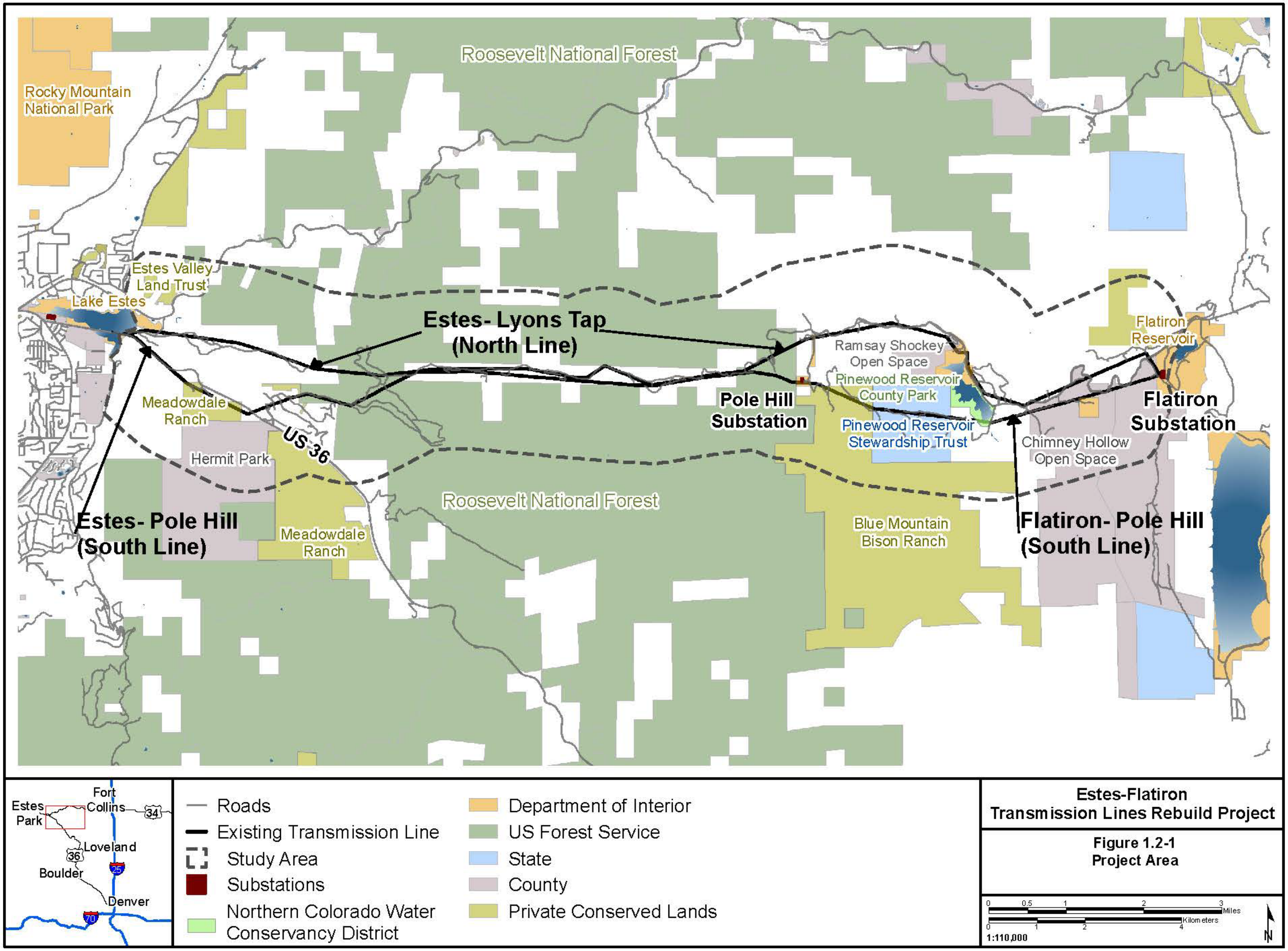


Figure 1.2-1
Project Area

The North Line was built in 1938 and the South Line in 1953. Most of the wood pole H-frame structures on the two lines are original and date from the time of construction. A single-mode fiber optic communication cable used by BOR, Western, and the Platte River Power Authority is part of the two lines. Although the majority of the existing rights-of-way (ROWs) are located on privately owned land, portions of both are located on public lands administered by the USFS, State Land Board, Larimer County Natural Resources Department, and BOR. Both of the existing lines are located within a designated utility corridor as defined in the 1984 Forest Plan for Arapaho and Roosevelt National Forests and Pawnee National Grassland (ARP) and the 1997 Revision (USFS 2012a).

1.3 Proposed Project

Western is proposing to rebuild the existing 115-kV system between Flatiron Substation and the intersection of Mall Road and U.S. Highway 36 in Estes Park. The Project would remove the existing 115-kV single-circuit transmission lines and wood structures and replace them with the following potential options: 1) a new double-circuit 115-kV transmission line on steel monopoles within a single ROW, potentially using a combination of two existing ROWs; 2) a new double circuit 115-kV transmission line on steel monopoles within a single ROW with a western portion buried in concrete cable trenches for about 2.6 miles; 3) both lines rebuilt as single-circuit transmission lines on wood-pole H-frame structures on separate ROWs, or 4) the No Action Alternative, which would keep the existing lines in place and continue established maintenance activities. The USFS action is to issue an authorization for the portion of the transmission line(s) rebuild that crosses National Forest System lands. The Project would improve access to the transmission lines for maintenance, increase the ability to restore outages more quickly, widen the ROWs where the existing ROW is inadequate, and implement an integrated vegetation management approach within the ROWs to ensure electrical clearance requirements are met and maintained for the life of the project. A detailed description of the alternatives, including the agency preferred alternative (APA) is provided in Chapter 2.0.

1.4 Purpose and Need

1.4.1 Western's Purpose and Need

Transmission systems in the U.S. are planned, operated, and maintained to meet North American Electric Reliability Corporation (NERC) reliability standards and National Electrical Safety Code (NESC) safety requirements. These organizations establish reliability, safety, and other standards for the bulk power system in the U.S. To fulfill its statutory mission, meet NERC and NESC standards, and comply with relevant legal requirements, Western must ensure its facilities meet current standards, are readily accessible for maintenance and emergencies (including vegetation maintenance), are resistant to wildfire, and are cost-effective for its customers. Through field inspections and maintenance records, Western has determined that the existing lines need to be upgraded and rebuilt.

1.4.1.1 Existing Structure Conditions

The existing wood structures are in poor condition and continue to deteriorate due to both age and the type of material with which they were constructed. Many of the existing structures on both lines suffer from core rot and cracking, and have reached or are reaching the end of their anticipated facility life. The majority of wood structures will need replacing in the near future to meet the strength and safety requirements found in NESC standards.

1.4.1.2 Existing Access Conditions

The transmission structures along the existing ROWs had access to them at one time for construction and maintenance. However, in the 60 to 75 years since the transmission lines were built, access has deteriorated at many locations. Portions of the existing lines are marginally accessible or not accessible at all, for routine maintenance and structure replacement. Inaccessible areas include sections of the existing transmission lines that span canyons, are located on steep cliff or rocky slopes, or require crossing the Pole Hill penstock (the water pipelines between Pinewood and Flatiron reservoirs).

1.4.1.3 Existing ROW Conditions

Portions of the existing transmission lines run parallel to each other in relatively close proximity. Each line has a separate ROW. The North Line has a ROW width of only 20 to 30 feet at most locations, which is inadequate to meet reliability and safety standards. The South Line has ROW widths that range from 75 feet to 130 feet for most of its length. Western would need to widen those portions of the ROW on both lines that have an easement width of less than 110 feet. The area crossed by the transmission lines is susceptible to mountain pine beetle infestation and currently has heavy fuel loads. Where ROWs have insufficient width and heavy fuel loading, they are more vulnerable to a large wildfire event. This level of risk does not meet applicable standards or Western’s commitment to its customers to provide reliable and safe power.

In many cases, ROW maintenance has been limited to removal of hazard trees. This practice typically does not address the encroaching vegetation until it becomes a threat that requires immediate attention to ensure no adverse effect to the transmission line or to avoid a fire caused by a transmission line. This reactive approach to hazardous vegetation maintenance is not conducive to ensuring the level of operating reliability that is required by today’s NERC standards, nor is it efficient or cost effective. Today’s stricter maintenance standards require a more proactive approach to vegetation management, with the goals of ensuring that there will be no tree-caused transmission line outages and minimizing the risk for wildfires. See Chapter 2.0 for further discussion of NERC standards and proposed vegetation management procedures.

1.4.2 Forest Service Purpose and Need

The USFS purpose and need is to determine whether to issue a special use permit for the proposed transmission lines upgrade and rebuild. In conjunction with the issuance, the USFS would bring Western's facilities under a current authorization with a defined ROW and an Operation and Maintenance Plan. The USFS would use the EIS to determine if the Project requires an amendment to the current Forest Plan.

1.5 Decision to Prepare an EIS

Western initially began preparation of an environmental assessment (EA) for the Project. Western’s Project is under a class of actions in the DOE NEPA Implementing Procedures (10 CFR Part 1021) that normally requires the preparation of an EA. Subsequent to the EA determination, Western held public meetings and received numerous written and oral comments from the public and agencies on the Project during the scoping period. The public expressed concerns regarding the impacts of the Project and some of the stakeholders requested evaluation of additional alternatives. In response to input received during the initial EA scoping process, Western determined that an EIS would be the more appropriate level of NEPA review.

1.6 Public Involvement

1.6.1 Scoping

Potential issues were identified through an expanded public involvement process that included agency discussions, two sets of public scoping meetings, and scoping comments received during two formal scoping periods. The first round of public meetings was held in Estes Park and Loveland, Colorado, on November 29 and 30, 2011. At that time, Western anticipated preparing an EA for the Project. The scoping period for the EA extended from November 29 through January 31, 2012. Additional comments were received through May 2012.

Subsequent to the initial EA scoping period, Western determined that an EIS was the appropriate level of analysis for this Project. A Notice of Intent (NOI) was issued on April 17, 2012 (77 Federal Register [FR] 22774; **Appendix A**). The NOI invited public participation in the EIS scoping process and solicited public comments on the scope of the EIS during a 90-day scoping period initially set to expire on July 16, 2012. An extension of the scoping period to August 31, 2012, was subsequently announced on the project website, through a press release, email notification, and direct mailing of a project newsletter. EIS scoping meetings were held on August 6, 2012, in Loveland, Colorado, and August 7, 2012, in Estes Park, Colorado. Both meetings utilized an open house format with exhibits and opportunities for interaction with Western and USFS representatives. In response to public requests to extend the scoping period beyond the August 31, 2012, deadline, Western further extended the scoping period to October 19, 2012.

In total, more than 660 comment letters, forms and emails were received during the two scoping periods for the EA and the EIS. Both the EA and EIS Scoping Summary Reports are available for download from the project website located at: https://www.wapa.gov/transmission/EnvironmentalReviewNEPA/Pages/estes-flatiron.aspx.

1.6.2 Alternative Development Workshops

Western implemented an expanded public involvement process for the Estes to Flatiron Transmission Lines Rebuild Project EIS. The expanded public involvement process included three public alternatives workshops held in Estes Park and Loveland during the public scoping period. The purpose of alternatives workshops was to solicit public input on route options and design features to be considered during the alternatives development process for the EIS. Workshops were held on October 2, 2012, in Loveland, and on October 3 and October 4, 2012, in Estes Park.

Alternatives workshops utilized an open house format, and sought to engage meeting attendees in interactive exercises to identify route options. Large-format informational displays provided information about the public involvement process, transmission line siting considerations, and context-sensitive design options. Maps depicting steep slopes, park and open space parcel boundaries, and viewsheds were on display, as well as large-format composite opportunity and constraint maps, to assist meeting participants with making informed suggestions on potential route options. Map booklets also provided detailed maps showing existing and proposed ROW in relation to parcel boundaries. Transmission structure options also were available for public review. A total of 49 meeting attendees signed in at the public alternatives workshops, including 27 at the meeting in Loveland, and 22 at the meetings in Estes Park.

1.6.3 Areas of Controversy

Rebuilding the transmission line on either the North Line or the South Line is controversial with the public. Neighborhood groups in proximity to the South Line expressed a strong preference for rebuilding the transmission line on the North ROW while neighborhood groups and residential uses in proximity to the North Line expressed a strong preference for rebuilding the transmission line on the South ROW. It should be noted that most, but not all, of the existing housing development construction occurred after the transmission lines were constructed. Homes within the oldest subdivision along the west region of the North Line were built starting in 1938 and into the 1940s. Homes adjacent to the South Line were first constructed in the early 1960s. A primary goal of alternatives development was to develop alternatives that responded to this conflicting input received from the public during scoping and the alternatives development workshops.

1.6.4 Issue Identification

Issues were defined as concerns about the potential effects of the Project. The range of issues was determined through agency, stakeholder, and public scoping, as well as through internal scoping between Western and the USFS. Each potential issue was evaluated to determine its relevance to the

Project. If the issue was determined to be a substantial concern, Western, in consultation with the USFS, evaluated whether it should be considered a “Key Issue” during the alternative development process. Western and the USFS cooperatively documented Key Issues. Key and other issues identified through scoping for the EIS are described in Sections 1.6.4.1 and 1.6.4.2 below.

1.6.4.1 Key Issues

Key Issues and other scoping inputs were used to guide the development of alternatives and compare the differences between the alternatives analyzed in detail. Key Issues underlined during the alternatives development include:

- Effects of new ROW acquisition on land uses, property owners, and Western's customers.
- Effects of the Project on scenic travel corridors (e.g., U.S. Highway 36), residential, and recreational viewsheds in the vicinity of Estes Park, residential developments, such as Meadowdale Hills and Newell Lake View subdivisions, and on National Forest System lands.
- Effects of new road construction in inaccessible areas with steep topography.
- Effects of the Project on recreational uses and experiences in the vicinity of Estes Park and Pinewood Reservoir, and on National Forest System lands accessed by USFS Road 122 (Pole Hill Road).
- Effects of the Project on protected areas, including county open space, lands protected by conservation easement, lands within the Stewardship Trust Program, and State Wildlife Areas. No protected areas have been identified on National Forest System lands.
- Effects of ROW expansion or new ROW acquisition on existing infrastructure (e.g., Upper Thompson Sanitation District’s treatment plant) and other structures.

1.6.4.2 Other Issues Selected for Detailed Analysis

Other issues define project effects that should be analyzed in detail in the EIS, but that have not driven alternatives development to the extent of the Key Issues. Other issues identified for detailed analysis include:

- Effects of the Project on property values and sources of revenue from tourism and outdoor recreation that Front Range communities and the regional economy rely upon.
- Effects of the Project (ground disturbance for access, pole removal, and new structure installation) on cultural resources.
- Effects of ROW clearing and road construction, road reconstruction, road reconditioning and ongoing maintenance on wetlands, soils, and water quality.
- Potential effects of electric and magnetic fields (EMFs) from high-voltage power lines on human health.
- Effects of the Project on wildlife; plants; fisheries; threatened, endangered and USFS sensitive species; management indicator species; and general species of wildlife, plants (vegetation) and fish.
- Effects of increased traffic on resources due to West Pole Hill Road improvement under Alternatives C and C1.

1.6.4.3 Issues Considered but Not Analyzed Further

The following issues were considered but not analyzed further:

- Comments that Western should replace the lattice structures along the causeway of Lake Estes as part of this Project. The lattice structures are already double-circuit and are not part of the scope of this Project.
- Comments that the E-PH transmission line is not within the USFS designated utility corridor as outlined in the ARP Forest Plan, and that consolidating the two lines on the South Line would not be in compliance with the ARP Forest Plan. The USFS has stated that the designated utility corridor includes both the transmission line ROWs (USFS 2012a).
- Comments that the Project is a "waste of taxpayer funds" were determined to be outside the scope of the EIS.
- A request that Western complete a socio-economic analysis of tourist and recreation based economies in Denver, Fort Collins, Boulder, and other Front Range cities supported by the Roosevelt National Forest. This issue is analyzed in the EIS; however, because socioeconomic effects of rebuilding the transmission would not extend beyond the immediate project vicinity, the analysis area is limited to the Town of Estes Park and Loveland.
- A request that Western expand notification during scoping and publish notices in papers in Denver, Boulder, and Longmont. Newspaper notices have been targeted for those communities where there is the greatest interest and potential for effects. Residents of Estes Park and Loveland would experience the greatest effects, and represent approximately 50 percent of the mailing addresses in the Project mailing list. Therefore, newspaper notices have been published in the Estes Park Trail-Gazette and Loveland Reporter-Herald. The USFS also published notices in their Newspaper of Record, which is the Fort Collins Coloradoan. Direct mailings, press releases, and website updates are the primary means to communicate project updates to individuals that have shown an interest in the Project and reside outside Estes Park and Loveland.
- Comments expressing general support for, or opposition to, the Project without supporting rationale were determined to be outside the scope of the EIS.

1.7 Decisions Framework

Western and the USFS prepared the EIS as the lead and cooperating Federal agencies, respectively. The results of the analysis are presented in this EIS and will form the basis for decisions regarding the Project.

Following the Draft EIS review and comment period, Western and the USFS considered comments submitted by the public, interested organizations and government agencies. Responses to all substantive comments are found in Chapter 9.0. Based on the Draft EIS and public input, Western and the USFS designated their APA and provided rationale in Sections 2.2.1.9 and 2.8. Public notice of the APA was released on Western's Project website as well as to interested parties December 2016. Western will issue a Record of Decision (ROD) no sooner than 30 days following the issuance of this Final EIS. Western may combine elements of alternatives considered in the EIS in the ROD.

As a cooperating agency, the USFS will prepare its own ROD in accordance with its respective policies and guidelines. The USFS is required to comply with all laws (National Forest Management Act [NFMA], NEPA, Section 7 of the Endangered Species Act [ESA], National Historic Preservation Act [NHPA], etc.), regulations, and policies for the portion of the Project on lands under its jurisdiction.

Instrumental to the decisions will be the consideration of measureable indicators that have been defined to measure the effects of the different alternatives with regard to key and other issues. The measurable indicators used to compare the alternatives are presented in Chapter 2.0, **Tables 2.9-1**,

2.9-2, and **2.9-3**. The USFS decision will be subject to a pre-decisional objection process. In order to have standing to object to the USFS decision, a person(s) or organization must have submitted specific written comments during the 45-day public comment period on the Draft EIS. These comments are addressed in the Final EIS in Chapter 9.0. The Final EIS and USFS draft ROD will be made available to the public. The 45-day Objection Period will begin with publication of a legal notice in the USFS newspaper of record, the Fort Collins Coloradoan. This objection process is provided in compliance with the Consolidated Appropriations Act of 2012.

1.8 Regulatory Framework

The Project would need to comply with applicable regulatory requirements, including statutes, regulations, executive orders, DOE orders and guidance, and permit requirements. Applicable requirements may include, but are not limited to, those listed below.

1.8.1 Statutes

- Antiquities Act of 1906 (54 USC §§ 320301-320303)
- Archaeological and Historic Preservation Act of 1960 (54 USC §§ 312501-312508), as amended
- Archaeological Resources Protection Act of 1979 (16 U.S.C. §§ 470aa-mm), as amended
- Bald and Golden Eagle Protection Act of 1940 (16 U.S.C. 668-668d), as amended
- Clean Air Act (CAA) of 1970 (42 U.S.C. §§ 7401 et seq.), as amended
- ESA of 1973 (7 U.S.C. § 136; 16 U.S.C. §§ 1531 et seq.), as amended
- Farmland Protection Policy Act of 1981 (7 U.S.C. §§ 4201-4209)
- Federal Water Pollution Control Act (Clean Water Act [CWA]) of 1972 (33 U.S.C. §§ 1251 et seq.), as amended
- Federal Noxious Weed Act of 1974, as amended (7 U.S.C. §§ 2814 et seq.)
- Historic Sites Act of 1935 (54 USC §320101)
- Migratory Bird Treaty Act (MBTA) of 1918 (16 U.S.C. §§ 703-712), as amended
- NEPA of 1969 (42 U.S.C. §§ 4321 et seq.)
- NFMA of 1976 (16 U.S.C. §§ 1600-1614)
- NHPA 1966 (54 USC §§ 300101 et seq)
- Native American Graves Protection and Repatriation Act of 1990 (25 U.S.C. § 3001 et seq.)
- Occupational Safety and Health Act of 1970 (29 U.S.C. § 1A651), as amended

1.8.2 Regulations

- CEQ Regulations for Implementing NEPA, 40 CFR Parts 1500-1508
- Determining Conformity of General Federal Actions to State or Federal Implementation Plans, 40 CFR Part 93, Subpart B
- Interagency Cooperation, ESA of 1973, as amended, 50 CFR Part 402
- U.S. Environmental Protection Agency (USEPA) Administered Permit Programs: the National Pollutant Discharge Elimination System (NPDES), 40 CFR Part 122
- Federal Hazardous Materials Transportation Regulations, 49 CFR Parts 171–180
- Hazardous Waste Management Regulations, 40 CFR Parts 260–270

- National Emission Standards for Hazardous Air Pollutants, 40 CFR Part 61
- National Register of Historic Places (NRHP), 36 CFR Part 60
- Occupational Safety and Health Standards and Regulations, 29 CFR Parts 1910 and 1926
- Protection of Historic Properties, 36 CFR Part 800
- U.S. Army Corps of Engineers (USACE) Regulatory Program Regulations, 33 CFR Parts 320-331.
- DOE NEPA Implementing Procedures, 10 CFR Part 1021
- DOE Compliance with Floodplain/Wetlands Environmental Review Requirements, 10 CFR Part 1022
- USFS NEPA Implementing Regulations, 36 CFR Part 220

1.8.3 Executive Orders

- Executive Order (EO) 11593, Protection and Enhancement of the Cultural Environment, May 13, 1971
- 11988, *Floodplain Management*, May 24, 1977
- EO 11990, *Protection of Wetlands*, May 24, 1977
- EO 12875, Enhancing the Intergovernmental Partnership, October 26, 1983
- EO 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations, February 11, 1994
- EO 13084, Consultation and Coordination with Indian Tribal Governments, May 14, 1998
- EO 13112, Invasive Species, February 3, 1999
- EO 13175, Consultation and Coordination with Indian Tribal Governments, November 6, 2000
- EO 13186, Responsibilities of Federal Agencies to Protect Migratory Birds, January 10, 2001
- EO 28357, Actions to Expedite Energy-Related Projects, May 18, 2001
- EO 13423, Strengthening Federal Environmental, Energy, and Transportation Management, 2007; and
- EO 13604, Improving Performance of Federal Permitting and Review of Infrastructure Projects, 2012.

1.8.4 DOE Orders and Guidance

- DOE Order 450.1, Environmental Protection Program
- DOE Order 451.1B, NEPA Compliance Program
- Office of NEPA Policy and Assistance, *Environmental Impact Statement Checklist*, November 12, 1997
- Office of NEPA Policy and Assistance, *Environmental Impact Statement Summary*, September 29, 1998
- Office of NEPA Policy and Compliance, *The EIS Comment-Response Process*, October 8, 2004
- Office of NEPA Policy and Compliance, Recommendations for the Preparation of EAs and EISs, Second Edition (the Green Book), December 23, 2004
- Office of NEPA Policy and Compliance, *EIS Distribution*, June 15, 2006

- Office of NEPA Policy and Compliance, Need to Consider Intentional Destructive Acts in NEPA Documents, December 1, 2006
- Office of NEPA Policy and Compliance, Procedures for Submitting Documents for Posting on the DOE NEPA Website, August 2008

1.8.5 Forest Service Directives

The USFS Directive System consists of the USFS manual and handbooks, which codify the agency's policy, practice, and procedure. The system serves as the primary basis for the internal management and control of all programs and the primary source of administrative direction to USFS employees. The Forest Service Manual (FSM) contains legal authorities, objectives, policies, responsibilities, instructions, and guidance needed on a continuing basis by USFS line officers and primary staff to plan and execute programs and activities. Forest Service Handbooks (FSH) are the principal source of specialized guidance and instruction for carrying out the direction issued in the FSM. Applicable USFS directives may include, but are not limited to, those listed below.

- FSM 1950, Environmental Policy and Procedures
- FSH 1909.15, Environmental Policy and Procedures Handbook
- FSM 2330, Publicly Managed Recreation Opportunities
- FSM 2520, Watershed Protection and Management
- FSH 2509.25, Watershed Conservation Practices Handbook
- FSM 2550, Soil Management
- FSH 2509.18, Soil Management Handbook
- FSM 2630, Management of Wildlife and Fish Habitat
- FSM 2670, Threatened, Endangered and Sensitive Plants and Animals
- FSH 2609.13, Wildlife and Fisheries Program Management Handbook
- FSM 2710, Special Use Authorizations
- FSH 2709.11, Special Uses Handbook
- FSH 701, Landscape Aesthetics, a Handbook for Scenery Management

1.8.6 State and Local Requirements

Federal agencies are not required to comply with the regulatory requirements of state or local land use regulations. Nevertheless, Western would plan, design, construct, and operate the Project in accordance with the substantive requirements of state and local plans and policies, whenever practicable.

1.9 Permits and Approvals

Permits and approvals that may be required for project implementation are summarized in **Table 1.9-1**.

Table 1.9-1 Permits and Approvals

Permit or Approval	Description	Statute or Regulation	Administrative Authority
Special-Use Authorization	A special-use authorization is a legal document such as a permit, term permit, lease, or easement, which allows occupancy, use, rights or privileges on National Forest System lands. The authorization is granted for a specific use of land for a specific period of time.	36 CFR Part 251	USFS
CWA § 401 Water Quality Certification	§ 401 of the CWA requires that federally permitted actions be reviewed for compliance with state water quality standards, if those actions may result in the discharge of pollutants to waters of the U.S within the state. State approval is granted via the § 401 Water Quality Certification.	§ 401 of CWA (33 U.S.C. §§1251 et seq.)	CDPHE
CWA § 402 NPDES Permit(s)	§ 402 of the CWA establishes the NPDES program regulating the discharge of pollutants to waters of the U.S. NPDES permits are required to authorize discharges of storm water associated with construction activities and discharges of construction dewatering effluent.	§ 402 of CWA (33 U.S.C. §§1251 et seq.)	CDPHE
CWA § 404 Department of the Army Permit	§ 404 of the CWA regulates the discharge of dredge and fill material into waters of the U.S. Regulated activities include most earthmoving activities in and along streams below the ordinary high water mark (OHWM), and within jurisdictional wetlands.	§ 404 of CWA (33 U.S.C. §§1251 et seq.)	USACE
ESA Section 7 Consultation	Required for all Federal actions to ensure minimization of adverse impacts to federally listed species. In 2017, Western initiated informal consultation with the USFWS to identify species and habitats of concern. A Biological Assessment was prepared for the Project.	ESA (16 U.S.C. §§ 1531 et seq.)	USFWS
NHPA Section 106 Consultation	Federal agencies are required to consult with the State Historic Preservation Office (SHPO) to seek ways to avoid, minimize, or mitigate adverse effects of a Federal action on historic properties.	NHPA (16 U.S.C. §§ 470 et seq.); 36 CFR Part 800	Colorado Office of Archaeology and Historic Preservation

CDPHE = Colorado Department of Public Health and Environment; NPDES = National Pollutant Discharge Elimination System; USFWS = U.S. Fish and Wildlife Service; USACE = U.S. Army Corps of Engineers.

1.10 Document Organization

The contents of each chapter of the EIS are as follows:

- Chapter 1.0 provides background information on the Project, states the purpose and need for the Project, and summarizes public involvement activities conducted in support of the EIS.
- Chapter 2.0 describes all alternatives considered in the EIS. It describes common features of transmission line design, construction, operation, and maintenance; discusses standard

construction processes (SCPs) and environmental protection measures (EPMs) to prevent or mitigate potential effects; and includes the APA definition and rationale, as well as a summary comparison of the environmental effects of the APA and alternatives.

- Chapter 3.0 describes the affected environment of resources that the alternatives could affect. Resources discussed include air quality; geology and paleontology; soils; water resources and floodplains; wetlands; vegetation; wildlife; special status and sensitive species; fuels and fire; land use and recreation; visual resources; socioeconomics, community resources and environmental justice; electrical effects and human health; cultural resources; and transportation.
- Chapter 4.0 describes the potential environmental effects of the alternatives. The chapter identifies the direct and indirect, short-term and long-term, beneficial and adverse effects, residual impacts, the relationship between short-term uses and long-term productivity, and irreversible and irretrievable commitments of resources for each resource identified in Chapter 3.0.
- Chapter 5.0 identifies the potential cumulative effects of the alternatives to each resource identified in Chapter 3.0. Cumulative impact is the impact on the environment that results from the incremental impact of the Project when added to the other past, present, and reasonably foreseeable future actions regardless of who undertakes the other actions.
- Chapter 6.0 provides a list of preparers, a contractor disclosure statement, and the distribution list for the Final EIS.
- Chapter 7.0 provides a list of references used in the document.
- Chapter 8.0 provides an index for the document.
- Chapter 9.0 provides the comments received on the Draft EIS from the public and agencies, and the responses to those comments.

2.0 Alternatives

2.1 Introduction

This chapter describes the range of alternatives considered to meet the identified Purpose and Need described in Chapter 1.0, including the No Action Alternative. The action alternatives include rebuilding the two separate transmission lines as a single double-circuit line using alternate alignments and designs, including underground construction for selected segments. An additional alternative would rebuild the two lines using structures very similar to those currently in use and generally located along the two existing ROWs. A double-circuit transmission line would carry six conductors on a single-pole structure within one ROW, while a single-circuit line would carry only three conductors on a single H-frame structure within one ROW. The existing ROWs would be expanded as needed and minor adjustments made to the alignments where necessary to comply with NERC and NESC requirements. The USFS action would be to issue a special use permit for the ROW of the Project that crosses USFS managed lands. USFS also would provide input on an Operation and Maintenance Plan for the portion of the transmission line rebuild Project that crosses National Forest System lands.

As described in Chapter 1.0, Western owns, operates, and maintains two transmission lines between the Flatiron Substation and the intersection of Mall Road and U.S. Highway 36 in Estes Park. Both lines begin as two distinct individual single-circuit lines at the Flatiron Substation near Loveland. The lines combine to a double-circuit line at the lattice structure located on Mall Road near Estes Park. This Project area ends where the lines become double-circuit at the easternmost lattice structure. The E-LT line is the more northern of the two lines and will be referred to in the remainder of this document as the North Line. The second, more southerly line, consisting of the E-PH and the F-PH lines will be referred to in this document as the South Line. Both existing transmission lines are 115-kV single-circuit lines constructed on wood pole H-frame structures.

Following public review of the Draft EIS, Western and the USFS, which is a cooperating agency on this Project, identified the APA in early December, 2016. All of the alternatives, and portions thereof described in detail were under consideration as well as the No Action Alternative. The APA is comprised of a combination of action alternatives analyzed in detail in the Draft EIS. See Sections 2.2 and 2.8 for further detail.

2.2 Alternatives Considered in Detail

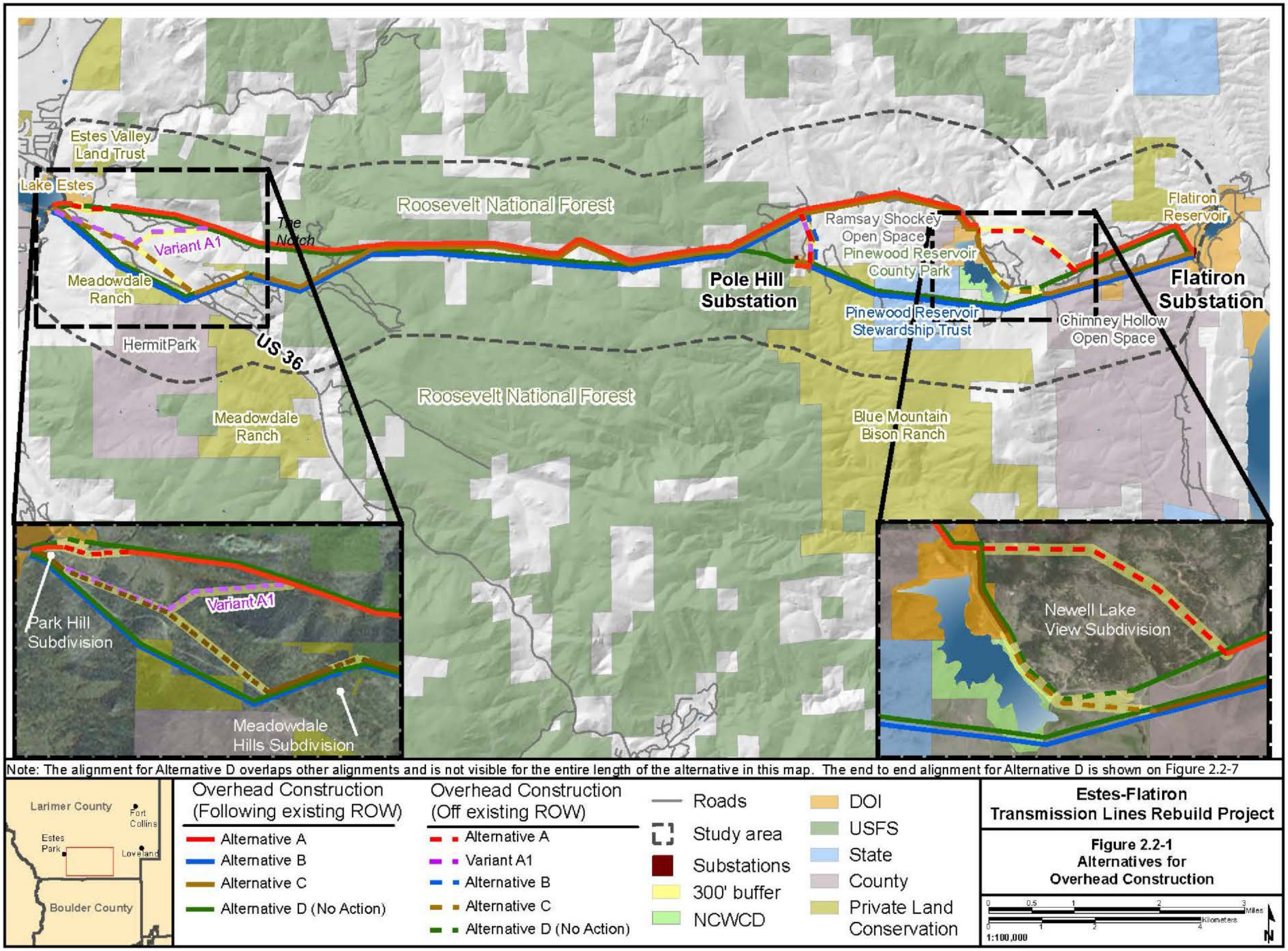
The development of a reasonable range of alternatives is an essential element of an EIS. As stated in the CEQ regulations for implementing NEPA, an EIS must rigorously explore and objectively evaluate all reasonable alternatives (40 CFR 1502.14a). NEPA also requires that a No Action Alternative be evaluated in addition to the action alternatives to establish a baseline for analysis, and to analyze the consequences of not implementing the Project.

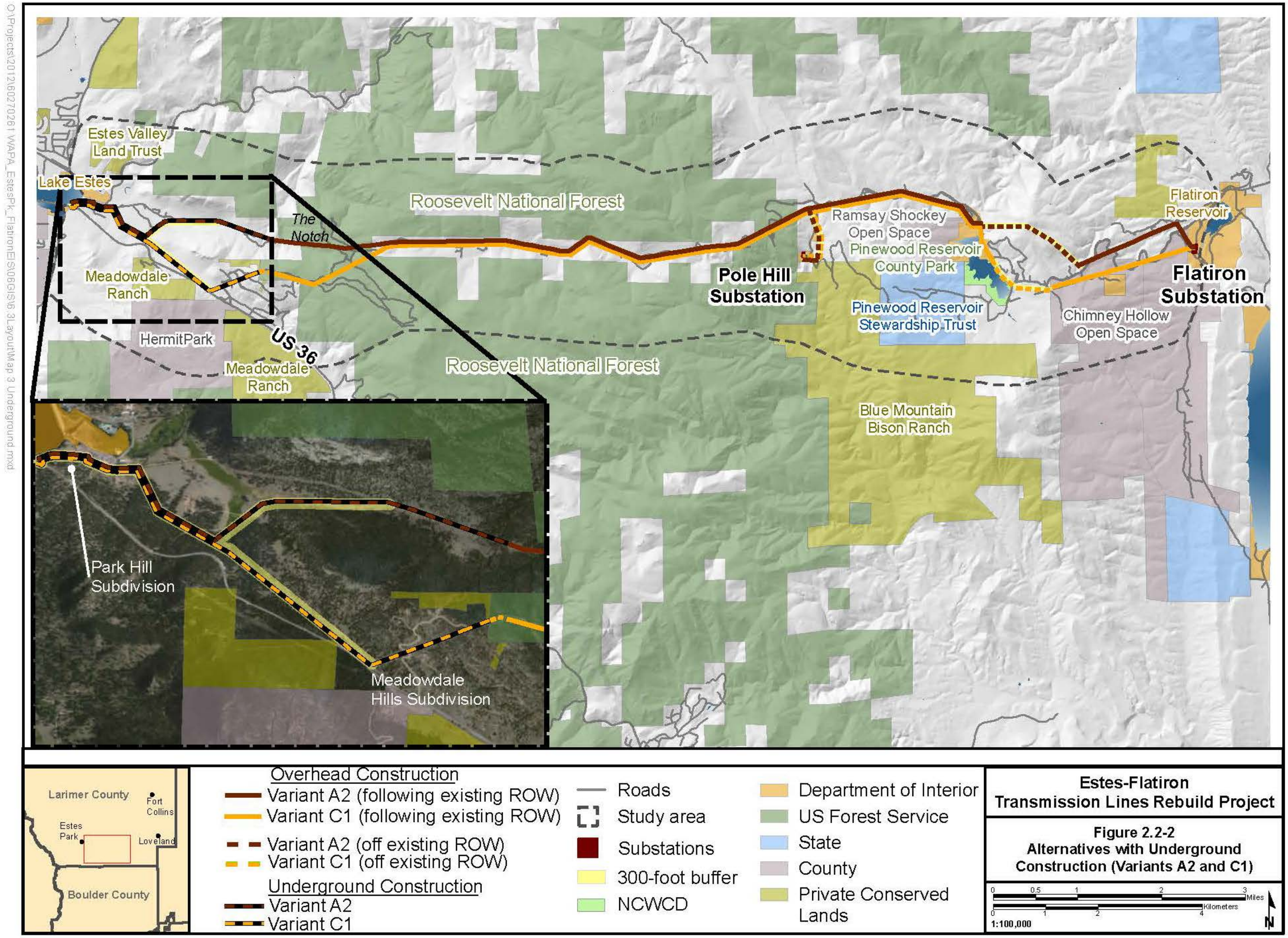
Alternatives Development Workshop

A range of reasonable alternatives for the Project was identified by evaluating routing opportunities and constraints, engineering design standards, public comments, and environmental resources that occur within the Project area. The objective was to identify alternatives that address public, environmental, and social concerns while meeting the Project purpose and need and engineering criteria for the transmission line rebuild Project. This process is subsequently described more in Section 2.2.1, and it resulted in a set of action alternatives evaluated in detail in the Draft EIS.

In the Draft EIS, seven full-length action alternatives to rebuild and upgrade the existing 115-kV transmission lines were identified for detailed analysis in addition to the No Action Alternative. These alternatives are described briefly below, and in greater detail in Sections 2.2.1.1 through 2.2.1.8. In this document "variant" alternatives refer to routing variations of the main alternative, whereas "reroutes" are any section of the alignment that is off existing ROW. The alignments of alternatives and routing variations using overhead construction methods are shown on **Figure 2.2-1**. The alignments of routing variations using underground construction methods are shown on **Figure 2.2-2**.

- **No Action Alternative** – Keep the existing transmission lines in service through continuing structure replacement and maintenance. The existing ROWs would be expanded as needed and minor adjustments made to the alignments where necessary in order to comply with NERC and NESC requirements. A segment through the Newell Lake View subdivision would be relocated and a new ROW acquired if necessary (see **Figure 2.2-1**).
- **Alternative A** – Rebuild and consolidate the transmission lines primarily on the existing North transmission line ROW. This alternative includes a reroute to the north and northeast of Newell Lake View subdivision and along Mall Road in Estes Park (see **Figure 2.2-3** in Section 2.2.1 subsequently).
  - **Variant A1** – Variant A1 is identical to Alternative A for all but the westernmost segment (see **Figure 2.2-4** in Section 2.2.1 subsequently). At a point in the valley between Mount Olympus and Mount Pisgah, this routing variation would depart from the alignment of the existing North Line and traverse along the base of Mount Pisgah before turning to the northwest and generally following an alignment parallel to U.S. Highway 36 for the remaining distance to the existing steel lattice double-circuit structure at the intersection of U.S. Highway 36 and Mall Road.
  - **Variant A2** – Variant A2 follows an alignment similar to Variant A1 except, the westernmost 2.7 miles of the transmission line would be constructed underground (**Figure 2.2-2**).
- **Alternative B** – Rebuild and consolidate the transmission lines, primarily on the existing South Line ROW. This alternative includes a 0.25-mile reroute along Pole Hill Road on National Forest System lands, and a 0.75-mile reroute to the North Line on new ROW in the vicinity of Pole Hill Substation (see **Figure 2.2-5** in Section 2.2.1 subsequently).
- **Alternative C** – Rebuild and consolidate the transmission lines along an alignment that utilizes a combination of the existing North and South line ROWs. This alternative includes reroutes off existing transmission line ROW east of Pinewood Reservoir, along Pole Hill Road on National Forest System lands, and on privately held land on the west end of the Project area (see **Figure 2.2-6** in Section 2.2.1 subsequently).
  - **Variant C1** – Rebuild and consolidate the transmission lines along an alignment that utilizes a combination of the existing North and South line ROWs. This alternative follows an alignment similar to Alternative C; except that the westernmost 2.7 miles of the transmission line would be constructed underground (**Figure 2.2-2**).
- **Alternative D** – Rebuild the two existing transmission lines in-kind as single-circuit lines located on separate ROWs. This alternative would utilize structures very similar to those currently in use, although structure height may increase by 5 to 10 feet. The existing ROWs would be expanded as needed and minor adjustments made to the alignments where necessary to comply with NERC and NESC requirements. This alignment includes a reroute to Pole Hill Road where there is inadequate ROW through Newell Lake View subdivision and relocation of one structure on the north side of the Upper Thompson Sanitation District parcel in Estes Park, to accommodate future expansion of their facility (see **Figure 2.2-7** in Section 2.2.1 subsequently).


Estes Valley Land Trust
Lake Estes
Meadowdale Ranch
Variant A1
The Notch
Hermit Park
US 36
Roosevelt National Forest
Meadowdale Ranch
Roosevelt National Forest
Pole Hill Substation
Ramsay Shockey Open Space
Pinewood Reservoir County Park
Pinewood Reservoir Stewardship Trust
Blue Mountain Bison Ranch
Flatiron Reservoir
Flatiron Substation
Chimney Hollow Open Space
Park Hill Subdivision
Meadowdale Hills Subdivision
Newell Lake View Subdivision
Note: The alignment for Alternative D overlaps other alignments and is not visible for the entire length of the alternative in this map. The end to end alignment for Alternative D is shown on Figure 2.2-7
Larimer County
Fort Collins
Estes Park
Loveland
Boulder County
Overhead Construction (Following existing ROW)
Alternative A
Alternative B
Alternative C
Alternative D (No Action)
Overhead Construction (Off existing ROW)
Alternative A
Variant A1
Alternative B
Alternative C
Alternative D (No Action)
Roads
Study area
Substations
300' buffer
NCWCD
DOI
USFS
State
County
Private Land Conservation
Estes-Flatiron Transmission Lines Rebuild Project
Figure 2.2-1 Alternatives for Overhead Construction
Miles
Kilometers
1:100,000
N


O:\Projects\2012\60270261 WAPA_EstesPk_FlatironEIS\06GIS\6.3LayoutMap 3 Underground.mxd
Estes Valley Land Trust
Lake Estes
The Notch
Roosevelt National Forest
Ramsay Shockey Open Space
Pinewood Reservoir County Park
Flatiron Reservoir
Meadowdale Ranch
Pole Hill Substation
Pinewood Reservoir Stewardship Trust
Flatiron Substation
Chimney Hollow Open Space
HermitPark
US 36
Meadowdale Ranch
Roosevelt National Forest
Blue Mountain Bison Ranch
Park Hill Subdivision
Meadowdale Hills Subdivision
Larimer County
Fort Collins
Estes Park
Loveland
Boulder County
Overhead Construction
Variant A2 (following existing ROW)
Variant C1 (following existing ROW)
Variant A2 (off existing ROW)
Variant C1 (off existing ROW)
Underground Construction
Variant A2
Variant C1
Roads
Study area
Substations
300-foot buffer
NCWCD
Department of Interior
US Forest Service
State
County
Private Conserved Lands
Estes-Flatiron Transmission Lines Rebuild Project
Figure 2.2-2
Alternatives with Underground Construction (Variants A2 and C1)
Miles
Kilometers
1:100,000
N

Each of these alternatives is described in detail in the remainder of this chapter, starting with a discussion of the alignments that were utilized and the process used to develop those alignments. Other elements of the alternatives are described in subsequent sections, including construction methods, design considerations and other Project features. Many of these elements are discussed under the heading Activities Common to All Action Alternatives (Section 2.3).

The detailed analysis of the seven full-length alternatives and the No Action Alternative supported Western's selection of an APA that grew out of the analysis and incorporated parts of several full-length alternatives. Linking portions of these analyzed alternatives would allow Western to further reduce expected environmental impacts while meeting the purpose and need objectives for the Project. The APA is described in Sections 2.2.1.9 and 2.8.1, and is depicted subsequently in **Figure 2.2-8**. The rationale for the selection is presented in Section 2.8.2.

2.2.1 Development of Alternative Alignments

To develop the range of alternatives considered, an evaluation of routing constraints and opportunities was completed focusing on an area generally 2 to 3 miles in width and extending between the Flatiron Substation and the Project terminus on the east side of Lake Estes. The 2- to 3-mile-wide study area was generated by mapping a 1-mile-wide buffer around all existing ROWs that have been in place for the last 60 to 75 years. This approach reflects Western's need to maximize use of existing ROW to reduce environmental impacts and ROW acquisition costs, avoid burdening new landowners who bought homes or land with no indication of a utility ROW near them when the property was acquired, and stay on existing disturbed ROW on USFS lands.

The initial step in this evaluation was to compile resource information within the study area. Using this information, an initial constraint/opportunity analysis was completed. The following constraint and opportunity criteria were incorporated into the analysis to address engineering and construction considerations (particularly access) as well as public scoping comments.

- Steep Slopes, which were defined as areas with slopes 30 percent or greater and no existing access.
- Visual Considerations, including those areas that would be highly visible from residences, recreation areas, and highways.
- Buildings, for which a 55-foot buffer was defined around existing buildings.
- Protected areas, including county open space, lands protected by conservation easement, lands within the Stewardship Trust Program, and State Wildlife Areas.

The results of this analysis were then used to create a composite map by highlighting areas with overlapping constraints. Varying tones were used to depict areas that ranged from no constraints to three overlapping constraints. This information was then used to assist in the identification of alternative alignments, which were subsequently incorporated into a series of overall alternatives.

A key step in the process was a series of alternatives development workshops that were held at the Estes Park Museum and the Bison Visitor Center near Flatiron Reservoir over a 3-day period in early October 2012. Workshop objectives included:

- Present opportunities, constraints, and other considerations that may influence potential transmission line routes.
- Suggest, review, and refine route options and design features.
- Provide a forum for the public to comment on or ask questions about the alternatives screening process.

In preparation for the alternatives workshops, Western compiled map data showing key siting considerations in the Project area. Mapped resource data were available for public review and comment and the public was invited to identify route options. Input on transmission line design features, such as structure type and finish, and method of construction also was requested. The workshops were attended by approximately 50 local residents and other interested parties and the input was considered in developing the alternatives described in this chapter.

The resulting alternatives are shown in **Figure 2.2-1** and **Figure 2.2-2**, and described in the remainder of this section. Additional potential alignments also were identified; these are discussed later in Section 2.7, Alternatives Considered but Dismissed. In all cases, the alternatives follow some portion of the existing transmission line alignments and the ROWs they utilize.

2.2.1.1 No Action Alternative

Consideration of the No Action Alternative is a required element of an EIS (40 CFR 1502.14(d)). Under the No Action Alternative, Western would leave in place both existing transmission lines from Mall Road in Estes to Flatiron Substation and replace structures at their current locations as they deteriorated. Maintenance requirements on the existing lines increase as the lines continue to age. The lines become difficult to keep in service in the very near term due to their age, deteriorating condition, and poor access. Western would need to replace deteriorating structures with increasing frequency. Approximately 70 to 80 percent of all structures will need replacement in the near future. Replacements of cross arms and other hardware would be required to keep the lines reliable and to ensure public and worker safety.

The No Action Alternative would require access to the existing transmission line ROWs to maintain the lines and replace deteriorated structures. See Section 2.3.2 for a discussion of the type and level of access required. In addition to maintenance and disturbance of the two ROWs and associated access roads, the No Action Alternative would involve the acquisition of additional ROW on private lands at locations where an adequate ROW had not been previously acquired. ROW widths along the existing transmission lines range from 20 to 130 feet. At locations with limited ROW width, it is difficult to maintain appropriate vegetation clearances and compliance with applicable reliability standards per, for example, NERC Standard FAC-003-1, Transmission Vegetation Management Program (NERC 2006). To comply with applicable standards and maintain an acceptable level of reliability, Western would require additional ROW at all locations on private land where the current ROW width is less than 75 feet. Depending on maintenance requirements, additional ROW would be required at some locations where the existing ROW width is less than 110 feet.

For much of the North Line, this would require acquisition of an additional 45 to 55 feet of ROW width over nearly its entire length, the only exceptions being short segments near Mall Road in Estes and near the Flatiron Substation. The South Line has sufficient ROW for the transmission line, with no new ROW expected to be needed except for some formal access. In one segment through the Newell Lake View subdivision, the existing line would be relocated for all alternatives. New ROW would be acquired where necessary. This is because several homes were built immediately adjacent to the existing transmission line ROW, thus creating an inadequate buffer that is not in compliance with Western's current ROW requirements.,

A basic difference between the action alternatives and No Action is that activities required to remove and replace deteriorated structures and other access improvements required for maintenance activities would occur incrementally over a longer period of time instead of within a specified construction schedule. Ultimately, the No Action Alternative would be similar to Alternative D in terms of activities required to maintain the lines in service and the amount of area disturbed. Western would coordinate with the USFS regarding pole replacement on National Forest System land and would not seek authorization to expand its ROW for the South Line. However, additional authorization would be needed for the North Line ROW expansion.

2.2.1.2 Alternative A – Construct a Double-circuit Line on a Consolidated ROW (North)

Alternative A would construct, operate, and maintain a new double-circuit line along the alignment of the existing North Line between the Flatiron Substation and the east shore of Lake Estes at Mall Road and U.S. Highway 36 (**Figure 2.2-3**). The existing structures would be removed and replaced with new double-circuit structures. See **Figure 2.2-9** and **Table 2.2-1** for information on structure design and dimensions for a description of the structure design. The new line would require a 110-foot ROW and generally follow the existing alignment except at two locations, both off National Forest System land. One of these departures from the existing alignment would occur in the vicinity of Newell Lake View subdivision where existing ROW is inadequate. To avoid these impacts, the alignment would depart from the existing ROW at a point approximately 1 mile east of the subdivision. At that point, the new alignment would turn to the northwest, using topography to reduce visibility where possible and traversing through steep and rugged terrain. The alignment would rejoin the existing transmission line alignment just north of Pinewood Lake Dam and continue along that alignment for most of the remaining distance to the intersection with the existing double-circuit line at Mall Road. The second departure from the alignment of the existing transmission line would occur east of Mall Road. Just east of the Upper Thompson Sanitation District's office and Mall Road, the new alignment would jog to the south along Mall Road to avoid a conflict with the Upper Thompson Sanitation District wastewater treatment plant. The reroute is referred as the Mall Road reroute in this document.

As depicted in **Figure 2.2-3** (center inset), another element of Alternative A is a short line segment (0.75 mile) that would extend south to the Pole Hill Substation. This segment would require new ROW and would be built using the same design as the double-circuit line.

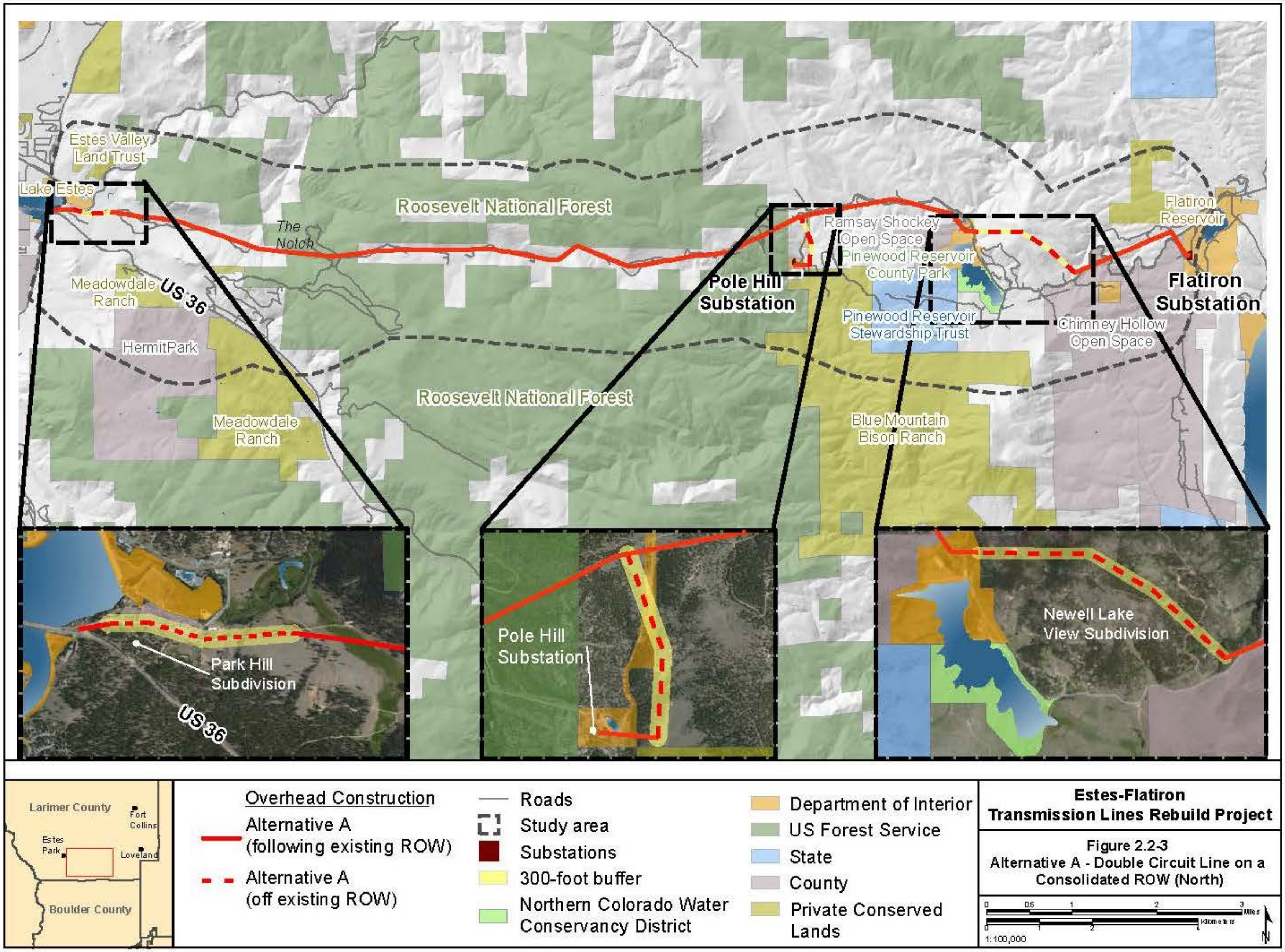
Construction of a double-circuit line along the alignment of Alternative A would allow the existing South Line to be removed and the ROW allowed to return to natural vegetation patterns. See Section 2.3.5 for a discussion of the removal process. Under Alternative A, the western end of Pole Hill Road would not be improved, and the road would retain its challenge for high clearance off road vehicle use (hereafter noted as four-wheel drive use). See Section 2.3.2.1 for additional information on access requirements under each of the alternatives.

2.2.1.3 Variant A1 – Western Alignment Option

Variant A1 is identical to Alternative A for all but the westernmost segment (**Figure 2.2-4**). At a point in the valley between Mount Olympus and Mount Pisgah, this routing variation would depart from the alignment of the existing North Line and traverse along the base of Mount Pisgah before turning to the northwest and generally following an alignment parallel to U.S. Highway 36 for the remaining distance to the intersection with the existing double-circuit line at Mall Road. This segment would require a new ROW for most of its length. Under Variant A1, the western end of Pole Hill Road would not be improved, and the road would retain its challenge for four-wheel drive use. See Section 2.3.2.1 for additional information on access requirements under each of the alternatives.

2.2.1.4 Variant A2 – Underground Construction along a Segment of Alternative A

Variant A2 is identical to Alternative A for all but the westernmost segment. The transmission line would be rebuilt aboveground following Alternative A until intersecting the underground portion of Variant A2. Structure types and construction methods along the aboveground portions of this alternative would be the same as described for Alternative A. The westernmost portion of this variant would be constructed underground following a new alignment as previously shown on **Figure 2.2-2**. Underground construction methods applicable to Variant A2 are described in Section 2.2.4. Under Variant A2, the western end of Pole Hill Road would not be improved, and the road would retain its challenge for four-wheel drive use. See Section 2.3.2.1 for additional information on access requirements under each of the alternatives.



Estes Valley Land Trust
Lake Estes
Roosevelt National Forest
The Notch
Meadowdale Ranch
US 36
HermitPark
Meadowdale Ranch
Roosevelt National Forest
Pole Hill Substation
Ramsay Shockey Open Space
Pinewood Reservoir County Park
Pinewood Reservoir Stewardship Trust
Blue Mountain Bison Ranch
Flatiron Reservoir
Flatiron Substation
Chimney Hollow Open Space
Park Hill Subdivision
US 36
Pole Hill Substation
Newell Lake View Subdivision
Larimer County
Fort Collins
Estes Park
Loveland
Boulder County
Overhead Construction
Alternative A (following existing ROW)
Alternative A (off existing ROW)
Roads
Study area
Substations
300-foot buffer
Northern Colorado Water Conservancy District
Department of Interior
US Forest Service
State
County
Private Conserved Lands
Estes-Flatiron Transmission Lines Rebuild Project
Figure 2.2-3
Alternative A - Double Circuit Line on a Consolidated ROW (North)
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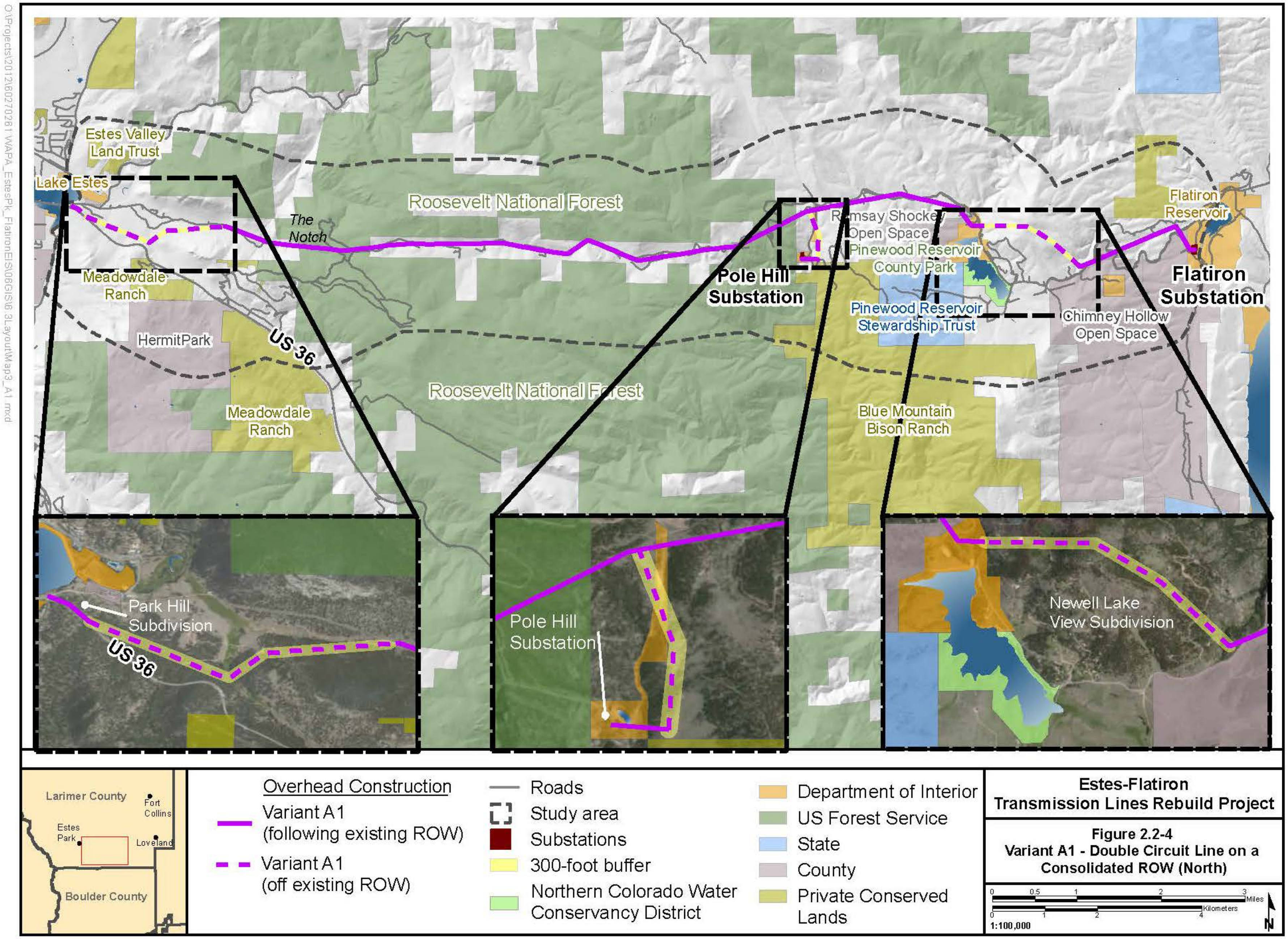


Figure 2.2-4
Variant A1 - Double Circuit Line on a Consolidated ROW (North)

2.2.1.5 Alternative B – Construct a Double-circuit Line on a Consolidated ROW (South)

Alternative B would construct, operate, and maintain a new double-circuit line along the alignment of the existing South Line for most of the distance between Flatiron Substation and the intersection of Mall Road and U.S. Highway 36 (refer to **Figure 2.2-5**). The existing structures would be removed and replaced with new double-circuit structures. Refer to **Figure 2.2-9** and **Table 2.2-1** for information on structure design and dimensions. The new line would require a 110-foot ROW and generally follow the existing alignment except at two locations. Just east of the Pole Hill Substation the alignment of Alternative B would turn north and partially parallel Lone Elk Road for 0.75 mile until intersecting the alignment of the existing North Line. A new ROW would be required for this segment. Alternative B diverts to the north at this location to avoid: 1) crossing the Pole Hill Penstock and 2) crossing the steep and rocky terrain located west of the Pole Hill Substation. Both the penstock and the rough terrain west of Pole Hill Substation would make permanent structure access problematic.

Alternative B would then follow the alignment of the existing North Line for approximately 1 mile to a point where the alignments of the two existing lines converge and parallel each other on separate ROWs. West of this point, Alternative B would follow the alignment of the existing South Line. A second 0.25-mile reroute would move the transmission line off the existing ROW to parallel the western end of Pole Hill Road on National Forest System land (see **Figure 2.2-5**).

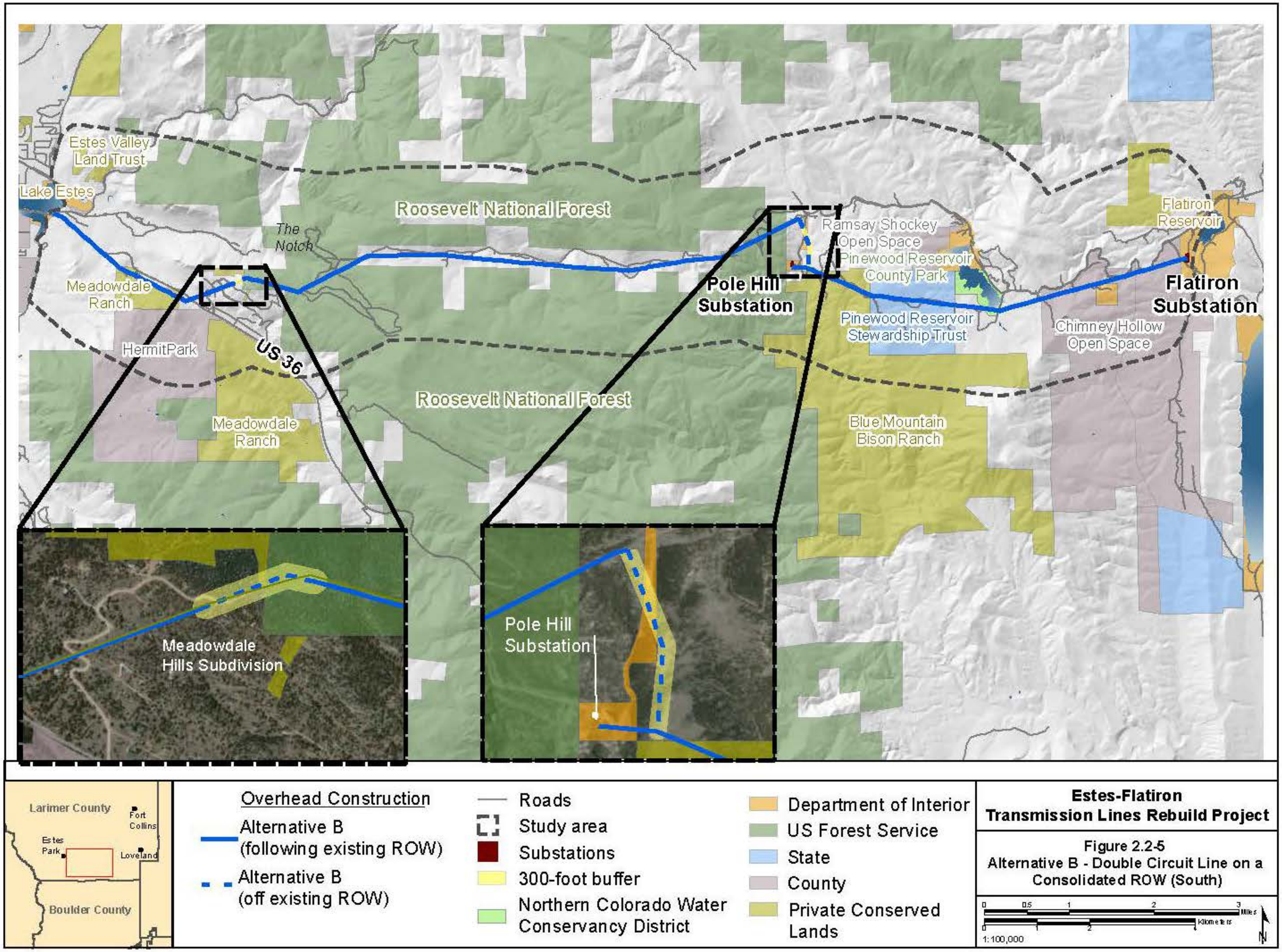
Because Alternative B turns to the north prior to reaching the Pole Hill Substation, a short (less than 0.25-mile) segment of transmission line would have to be constructed to maintain an electrical connection to the substation.

Construction of a double-circuit line along the alignment of Alternative B would allow the existing North Line to be removed and the ROW to return to natural vegetation patterns. See Section 2.3.4 for a discussion of the removal process. However, it would be necessary to leave a portion of the existing structures in place to maintain the existing fiber optic service provided to Pinewood Dam. This would be accomplished by leaving a single pole in place at each existing structure site along the North Line between the dam and the vicinity of the Green Mountain Drive. The remaining single pole at each structure site would be utilized to support the fiber optic line.

Under Alternative B, the western end of Pole Hill Road would not be improved, and the road would retain its challenge for four-wheel drive use. New access would be needed in the west region for construction and maintenance. The previous access road has been closed as a result of flood damage. See Section 2.3.2.1 for additional information on access requirements under each of the alternatives.

2.2.1.6 Alternative C – Construct a Double-circuit Line on a Consolidated ROW Using a Combination of Alignments

Alternative C would build a new double-circuit line between Flatiron Substation and the intersection of Mall Road and U.S. Highway 36 using a combination of alignments, including the alignments of both existing lines as well as new alignments in some locations (**Figure 2.2-6**). See **Figure 2.2-9** and **Table 2.2-1** for information on structure design and dimensions. After leaving the Flatiron Substation, Alternative C would follow the alignment of the existing South Line for a distance of just over 2 miles before turning to the northwest as it approaches Pinewood Lake. Just east of Pinewood Lake, Alternative C would leave the alignment of the existing South Line and follow a new alignment, generally paralleling Pole Hill Road along the south edge of the Newell Lake View subdivision until intersecting with the alignment of the existing North Line near Pinewood Lake Dam. From this point, Alternative C would follow the alignment of the existing North Line to the point where the North and South lines diverge just east of The Notch (**Figure 2.2-6**). Alternative C would then cross over to the alignment of the South Line at the point where the two existing lines separate and continue on existing



Estes Valley Land Trust
Lake Estes
Meadowdale Ranch
Hermit Park
US 36
The Notch
Roosevelt National Forest
Meadowdale Ranch
Roosevelt National Forest
Pole Hill Substation
Ramsay Shockey Open Space
Pinewood Reservoir County Park
Pinewood Reservoir Stewardship Trust
Blue Mountain Bison Ranch
Chimney Hollow Open Space
Flatiron Reservoir
Flatiron Substation
Meadowdale Hills Subdivision
Pole Hill Substation
Larimer County
Fort Collins
Estes Park
Loveland
Boulder County
Overhead Construction
Alternative B (following existing ROW)
Alternative B (off existing ROW)
Roads
Study area
Substations
300-foot buffer
Northern Colorado Water Conservancy District
Department of Interior
US Forest Service
State
County
Private Conserved Lands
Estes-Flatiron Transmission Lines Rebuild Project
Figure 2.2-5
Alternative B - Double Circuit Line on a Consolidated ROW (South)
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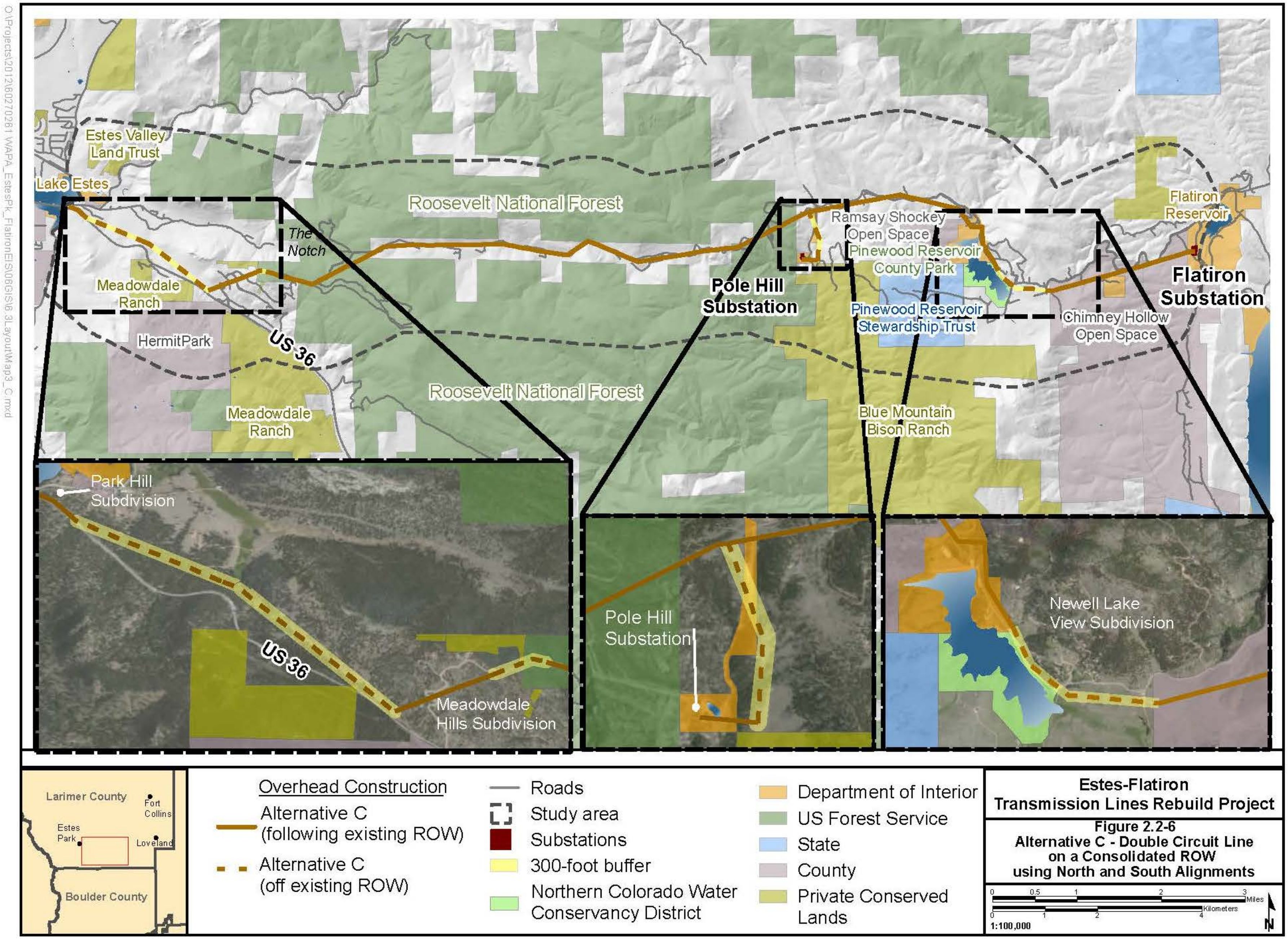
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Pole Hill Substation
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Pinewood Reservoir County Park
Pinewood Reservoir Stewardship Trust
Blue Mountain Bison Ranch
Chimney Hollow Open Space
Flatiron Reservoir
Flatiron Substation
Park Hill Subdivision
US 36
Meadowdale Hills Subdivision
Pole Hill Substation
Newell Lake View Subdivision
Larimer County
Fort Collins
Estes Park
Loveland
Boulder County
Overhead Construction
Alternative C (following existing ROW)
Alternative C (off existing ROW)
Roads
Study area
Substations
300-foot buffer
Northern Colorado Water Conservancy District
Department of Interior
US Forest Service
State
County
Private Conserved Lands
Estes-Flatiron Transmission Lines Rebuild Project
Figure 2.2-6
Alternative C - Double Circuit Line on a Consolidated ROW using North and South Alignments
0 0.5 1 2 3 Miles
0 1 2 4 Kilometers
1:100,000
N

ROW and a 0.25-mile reroute to parallel the western end of Pole Hill Road on National Forest System land. The alignment would continue on existing ROW through the Meadowdale Hills subdivision to U.S. Highway 36. Instead of crossing the highway at this location, Alternative C would follow a new alignment generally parallel to U.S. Highway 36 for the remaining distance to the intersection of Mall Road and U.S. Highway 36.

New ROW would be required for this segment, which is intended to reduce visibility from U.S. Highway 36. To further reduce visibility, special design measures would be considered for this segment and Meadowdale Hills subdivision, including the use of structures with a lower height and shorter span. See **Figure 2.2-9** and **Table 2.2-1** for information on structure design and dimensions.

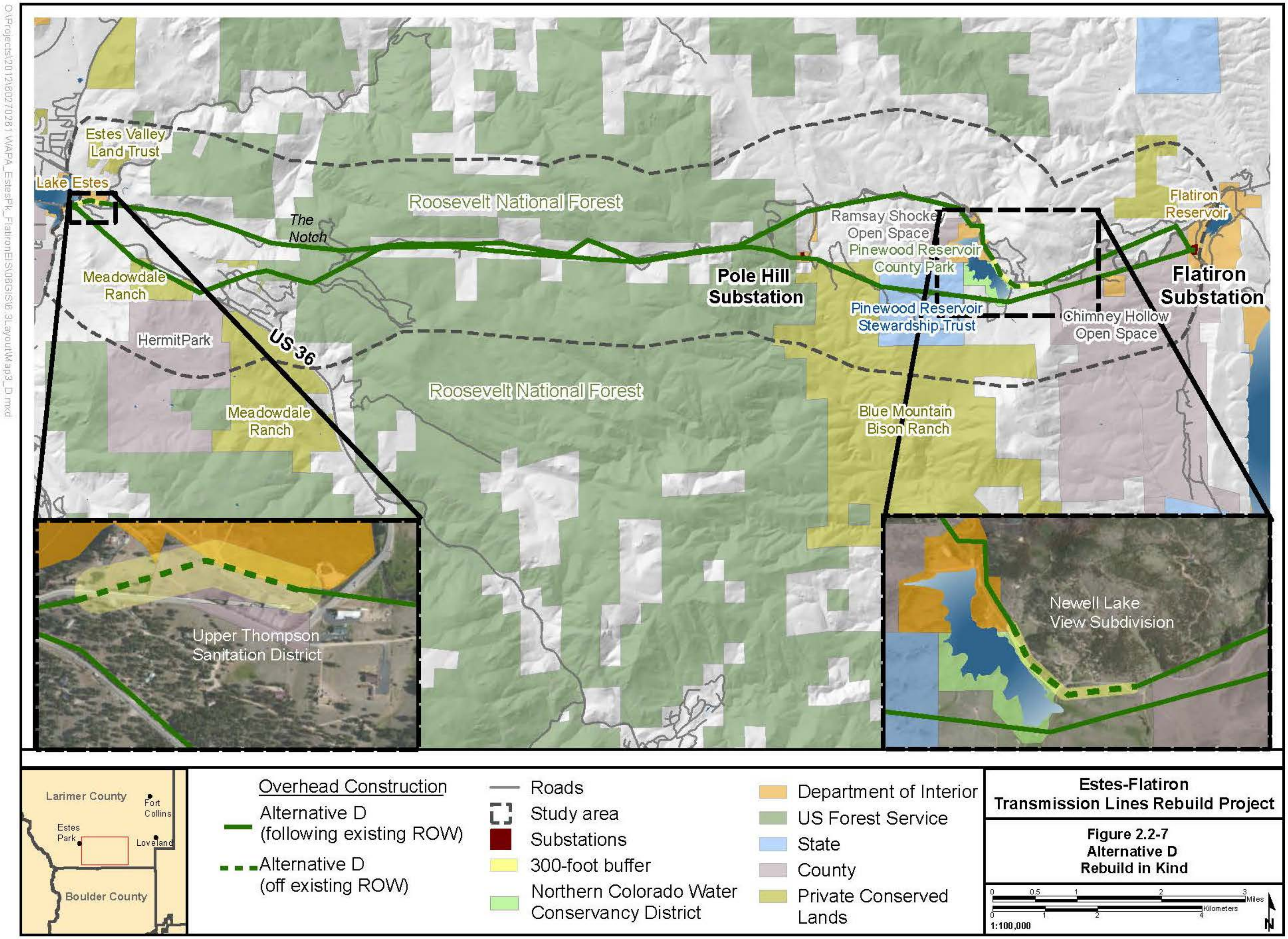
Because Alternative C would turn to the north prior to reaching the Pole Hill Substation, a short (less than 0.25-mile) segment of double-circuit transmission line would have to be constructed to maintain an electrical connection to the substation.

At locations where the Alternative C alignment follows one of the existing transmission lines, the existing structures would be replaced with new double-circuit structures, but exact locations would vary depending on final design. At other locations where the new double-circuit line is not using an existing or expanded ROW, existing structures would be removed and the ROW allowed to return to natural vegetation patterns. See Section 2.3.5 for a discussion of the removal process. Under Alternative C, Pole Hill Road would be reconstructed on National Forest System land to level the grade, removing the challenge for four-wheel drive use. New access would be needed in the west region for construction and maintenance. The previous access road has been closed as a result of flood damage. See Section 2.3.2.1 for additional information on access requirements under each of the alternatives.

2.2.1.7 Variant C1 – Underground Construction along a Segment of Alternative C

Variant C1 is identical to Alternative C for all but the westernmost segment. The transmission line would be rebuilt aboveground following Alternative C until intersecting the USFS boundary near the Meadowdale Hills subdivision. Structure type and construction methods along the aboveground portions of this alternative would be the same as described for Alternative C. The westernmost portion of this alternative, from Mall Road to the USFS boundary adjacent to the Meadowdale Hills subdivision, would be constructed underground following a new alignment as shown previously on **Figure 2.2-2**. Underground construction methods applicable to Variant C1 are described in Section 2.2.4.

Under Variant C1, Pole Hill Road would be reconstructed on National Forest System land to level the grade, removing the challenge for four-wheel drive use. New access would be needed in the west region for construction and maintenance. The previous access road has been closed as a result of flood damage. See Section 2.3.2.1 for additional information on access requirements under each of the alternatives.



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Pole Hill Substation
Ramsay Shockey Open Space
Pinewood Reservoir County Park
Pinewood Reservoir Stewardship Trust
Blue Mountain Bison Ranch
Chimney Hollow Open Space
Flatiron Reservoir
Flatiron Substation
Upper Thompson Sanitation District
Newell Lake View Subdivision
Larimer County
Fort Collins
Estes Park
Loveland
Boulder County
Overhead Construction
Alternative D (following existing ROW)
Alternative D (off existing ROW)
Roads
Study area
Substations
300-foot buffer
Northern Colorado Water Conservancy District
Department of Interior
US Forest Service
State
County
Private Conserved Lands
Estes-Flatiron Transmission Lines Rebuild Project
Figure 2.2-7
Alternative D
Rebuild in Kind
Miles
Kilometers
1:100,000
N

2.2.1.8 Alternative D – Rebuild In-kind

Alternative D (**Figure 2.2-7**) would rebuild both the existing North and South lines in-kind as single-circuit lines using structures very similar to those currently in use. Refer to **Figure 2.2-9** and **Table 2.2-1** for information on structure design and dimensions. The existing ROWs would be expanded as needed and minor adjustments would be made to the alignments where necessary for compliance with NERC requirements. Additionally, extensive access road construction would be required to access each structure location. An adjustment to the alignment would occur in the vicinity of the Newell Lake View subdivision where there is inadequate ROW. To avoid these impacts, the alignment would depart from the existing ROW near the east boundary of the subdivision and follow an alignment generally along Pole Hill Road, rejoining the existing ROW just north of Pinewood Lake Dam. The location of one structure on the north side of the Upper Thompson Sanitation District parcel in Estes Park also would be adjusted to accommodate future expansion of their facility (**Figure 2.2-7**).

Under Alternative D, the western end of Pole Hill Road would not be improved, and the road would retain its challenge for four-wheel drive use. See Section 2.3.2.1 for additional information on access requirements under each of the alternatives.

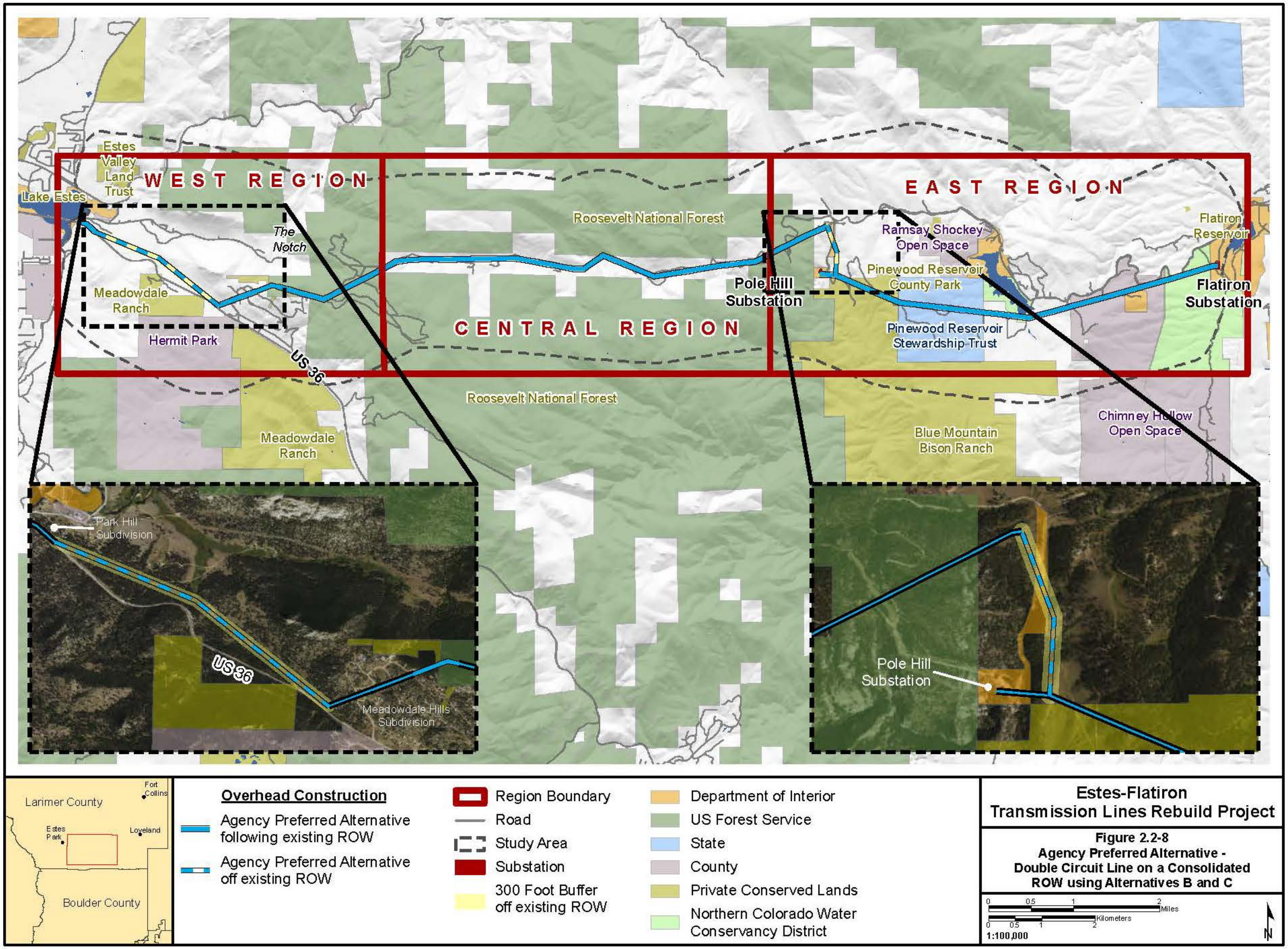
2.2.1.9 Agency Preferred Alternative – Construct a Double-circuit Line on a Consolidated ROW Using a Revised C Alignment with a Portion of Alternative B

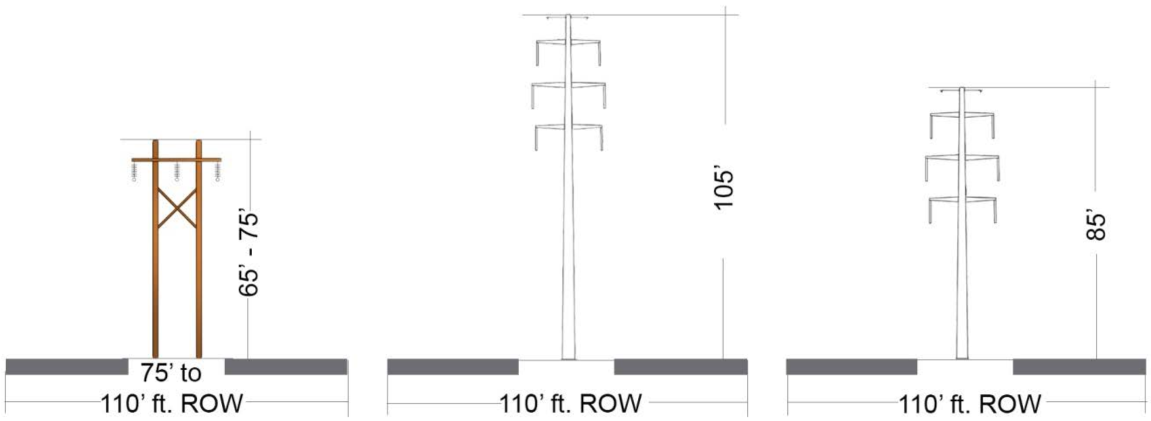
As depicted in **Figure 2.2-8**, the APA would be a new double-circuit line between Flatiron Substation and U.S. Highway 36 at the intersection of Mall Road using Alternative C alignment in the west and primarily Alternative C alignment in the center, and Alternative B alignment in the east.

In the west region, the APA would follow the Alternative C alignment along Pole Hill Road through the Meadowdale Hills subdivision to U.S. Highway 36 (inset, **Figure 2.2-8**). In adapting part of Alternative C for the APA, the four-wheel drive of West Pole Hill Road would not be reconstructed or improved on National Forest System land, retaining the challenge for four-wheel drive use in response to Draft EIS public comments. New access would be needed in the west region for construction and maintenance. The previous access road has been closed as a result of flood damage. In addition, instead of crossing over U.S. Highway 36, the APA would follow the Alternative C alignment for 1.7 miles, generally parallel to and north of U.S. Highway 36 down the valley for the remaining distance to the intersection of Mall Road and U.S. Highway 36.

New ROW would be required for the last segment on the west end of Alternative C to reduce visibility from U.S. Highway 36. Special design measures would be considered for this segment within the Meadowdale Hills subdivision, including the use of structures with a lower height and shorter span, if they provide a lower visual impact. This option could result in a structure-for-structure replacement instead of eliminating some structures entirely. Refer to **Figure 2.2-9** and **Table 2.2-1** for information on structure design and average dimensions.

In the central region on private lands (**Figure 2.2-8**), the APA primarily would follow the North Line, but may shift to the South Line and back again to stay close to Pole Hill Road, thus minimizing the need for access roads and ROW maintenance disturbance.


WEST REGION
CENTRAL REGION
EAST REGION
Estes Valley Land Trust
Lake Estes
The Notch
Meadowdale Ranch
Hermit Park
US 36
Roosevelt National Forest
Pole Hill Substation
Ramsay Shockey Open Space
Pinewood Reservoir County Park
Pinewood Reservoir Stewardship Trust
Flatiron Reservoir
Flatiron Substation
Blue Mountain Bison Ranch
Chimney Hollow Open Space
Park Hill Subdivision
Meadowdale Hills Subdivision
Larimer County
Fort Collins
Estes Park
Loveland
Boulder County
Overhead Construction
Agency Preferred Alternative following existing ROW
Agency Preferred Alternative off existing ROW
Region Boundary
Road
Study Area
Substation
300 Foot Buffer off existing ROW
Department of Interior
US Forest Service
State
County
Private Conserved Lands
Northern Colorado Water Conservancy District
Estes-Flatiron Transmission Lines Rebuild Project
Figure 2.2-8
Agency Preferred Alternative - Double Circuit Line on a Consolidated ROW using Alternatives B and C
Miles
Kilometers
1:100,000



Average 115-kV Single-circuit Wood Pole H-frame Structure Alternatives D and No Action	Average 115-kV Double-circuit Single-pole Standard Steel Structure Alternatives A, A1, A2, B, C, C1, APA	Average 115-kV Double-circuit Single-pole Standard Steel Short Structure Alternatives A, A1, A2, B, C, C1, APA

Figure 2.2-9 Existing 115-kV Single-circuit Wood Pole H-frame Structure and Proposed 115-kV Double-circuit Single-pole Steel Structures

In the east region, from the Flatiron Substation, the APA would follow the Alternative B alignment along the existing South Line to the Pole Hill Substation. Just east of the Pole Hill Substation, the APA would continue to follow the alignment of Alternative B which would turn north and partially parallel Lone Elk Road for 0.75 mile until intersecting the alignment of the existing North Line. A new ROW along existing roads would be required for this short segment, as well as new access spur roads to new structures. Shifting to the North Line at this point would avoid crossing the Pole Hill Penstock and the steep and rocky terrain west of the Pole Hill Substation.

At locations where the APA alignment would follow the existing transmission line routes, the existing structures would be replaced with new double-circuit galvanized steel monopole structures. Individual structure locations could vary depending on final design. Should the same number or fewer steel monopole structures be placed on the existing centerline adjacent to National Forest System roads, a change to Recreation Opportunity Spectrum (ROS) classification would not occur, and would not require a Forest Service Plan Amendment.

On abandoned ROW, existing structures would be removed and the ROW allowed to return to natural vegetation patterns. See Section 2.3.4 for a discussion of the removal process.

2.2.2 Description of Transmission Facilities

Figure 2.2-9 shows a typical single-circuit 115-kV wood H-frame structure, which is the structure type that is utilized along both the existing North and South lines, and a 115-kV double-circuit steel structure. The single-pole double-circuit steel structures would replace the existing single-circuit wood structures and would be utilized for all segments of Alternatives A, B, and C; Variant A1; and overhead sections of Variants A2 and C1. The structures would be set in augered holes with an average depth of 18 feet; however, a maximum depth of up to 30 feet may be required at some locations. Structures located at a point where the alignment makes major angles would have a larger diameter and require a concrete foundation to provide additional support.

Table 2.2-1 Typical Transmission Structures

Description	Alternatives A, A1, A2, B, C, and C1, APA 115-kV Double-circuit Single-pole Standard Steel Structures	Alternatives A, A1, A2, B, C, and C1, APA 115-kV Double-circuit Single-pole Shortened Steel Structures[1]	Alternative D 115-kV Single-circuit Wood-pole H-frame Structures
ROW width	110 feet	110 feet	110 feet
Span between structures (average)	850 feet	450 feet	600 to 700 feet
Span between structures (maximum)	1,300 feet	700 feet	1,300 feet
Number of structures (average)	6 per mile	12 per mile	8 per mile
Height of structure (average)	105 feet	85 feet	65 feet
Height of structure (typical range)	100 to 130 feet	80 to 110 feet	50 to 75 feet
Width of structure cross/davit arm	20 feet at davit arm	20 feet at davit arms	25 feet at cross arm
Width of structure at ground level	4 to 8 feet	3 to 7 feet	12 feet
Structure base area	28 square feet per structure	23 square feet per structure	3.5 square feet per pole
Land disturbed by construction at each structure base	11,350 square feet (0.26 acre) on average	11,350 square feet (0.26 acre) on average	9,500 square feet (0.22 acre) on average
Distance between conductor stringing sites	1.5 to 3 miles	1.5 to 3 miles	1.5 to 3 miles
Land disturbed at each stringing site	0.25 acre 105 feet x 105 feet	0.25 acre 105 feet x 105 feet	0.25 acre 105 feet x 105 feet
Conductor type and size	ACSR 795 kcmil	ACSR 795 kcmil	ACSR 795 kcmil
Circuit conductors configuration	Vertical	Vertical	Horizontal
Minimum ground clearance beneath conductors	22 feet	22 feet	22 feet

[1] Structures with a shorter average height and span would be considered parallel to U.S. Highway 36 or adjacent to residential subdivisions.

kcmil = thousand circular mil.

The steel pole structures would be galvanized steel. In some select western subdivisions and USFS lands, self-weathering steel structures were considered for visual reasons. The latest field experience information from the utility industry on self-weathering structures indicates that ongoing corrosion weakens these structures, therefore shortening their expected service life. For this reason, and the fact the Forest Service prefers dull galvanized steel, self-weathering steel structures would not be used for this Project. Conductor size would be increased from 397.5 Aluminum Conductor Steel-Reinforced (ACSR) to 795 ACSR. The new steel structures would average 105 feet tall, approximately 40 feet taller than the existing 65-foot-tall H-frame structures (**Table 2.2-1**). The additional height is required to accommodate the double-circuit line configuration as the minimum distance between the lower conductors and the ground at mid-span must be maintained. Structure heights would vary depending on site-specific considerations, particularly terrain. At locations where visibility from sensitive viewpoints is a major concern, structures with a shorter average height (85-foot) and shorter average span length could be utilized. For example, structures with a shorter average height and span would be considered parallel to U.S. Highway 36 or adjacent to residential subdivisions, such as Park Hill, Meadowdale Hills, and/or Newell Lake View subdivisions, and on National Forest System lands. However, the visual trade-off with shorter structures is that the shorter design would result in roughly twice the number of structures in a given length of ROW to meet required conductor clearances. The Design Phase of this Project would provide the opportunity for Western to address pole height exceptions for specific locations.

The wood H-frame structure design that would be utilized for Alternative D would be very similar to the design shown in **Figure 2.2-9**. However, the conductor size would be increased to 795 ACSR on each line, resulting in taller structures (5 to 10 feet) than those currently in use. Two overhead groundwires, one of which being fiber optic groundwire, would be added to the top of the structures to replace the existing system that would be removed by reconstruction of the two existing lines. Under the No Action Alternative, the conductor would not be replaced and any poles replaced during routine maintenance of the line would be similar in appearance and dimension to the existing poles.

2.2.3 Comparison of ROW Lengths and Land Ownership Crossed

Table 2.2-2 provides a comparison of alternative ROW lengths and land ownership crossed by alternative ROWs.

2.2.4 Underground Construction

Variants A2 and C1 would build a portion of the new line underground. The locations of the underground segments are shown in **Figure 2.2-2**. The length of underground construction would be 2.67 miles for Variant A2 and 2.74 miles for Variant C1.

Cross-linked polyethylene cable is the proposed type for the underground Variants A2 and C1. Each transmission line circuit would utilize three separate cables, just as three bare conductors are required for aboveground transmission lines. The single duct bank required for the proposed double-circuit North Line and South Line would accommodate six cross-linked polyethylene power cables, two fiber optic communications cables, and two spare conduits. Polyvinyl chloride conduits would be set in a concrete duct bank designed to enclose and protect the conduits, and to dissipate the normal heat generated by the power cables. Installing two circuits underground in a common concrete-encased duct bank entails deep excavation using sloped trenches or trench boxes. The duct bank would be approximately 4 feet in height and 6 feet wide, located at the bottom of a 9-foot-deep trench. The top of the concrete duct bank would be covered with 5 feet native soil backfill (HDR 2013). Photos of typical underground construction methods are provided in **Figure 2.2-10**.

Table 2.2-2 Comparison of Alternative Elements

Alternative	Total Length (miles)	Within Existing ROW (miles)	Within New ROW (miles)	Land Ownership Crossed (miles)					
				County	SLB	NCWCD	USFS	DOI	Private/ Other
No Action	28.6	27.6	1	1.7	1.0	1.5	3.4	0.2	20.8
A	15.1	12.6	2.4	0.6	-	0.4	1.5	0.1	12.5
Variant A1	15.2	11.4	3.7	0.5	-	0.4	1.5	0.1	12.7
Variant A2	15.3	11.3	4.0	0.5	-	0.4	1.5	0.1	12.8
B	14.8	13.8	1.0	1.0	1.0	0.8	2.0	0.1	9.9
C	15.5	12.1	3.4	1.1	-	1.1	2.0	0.1	11.2
Variant C1	15.6	11.7	4.0	1.1	-	1.1	2.0	0.1	11.3
APA	14.9	12.4	2.5	1.0	1.0	0.8	2.0	0.1	10.0
D	28.6	27.6	1	1.7	1.0	1.5	3.4	0.2	20.8

SLB = State Land Board (Colorado), NCWCD = Northern Colorado Water Conservancy District, DOI = U.S. Department of the Interior.

Trench dimensions would be wider and deeper in places where vaults are located. Vaults are large concrete boxes buried at specific intervals along the route centerline to provide permanent access to the conduits for cable installation, and adequate space for installing and securing polymer pre-molded cable splices. Separate vaults would be used for each circuit. The number and spacing of vaults required for an underground transmission line would be dictated by the length of cable that can be transported on a reel, the cable’s allowable pulling tension, elevation changes along the route, and the internal cable sidewall pressure encountered as it is installed through bends in the centerline. A 115-kV cross-linked polyethylene cable requires a splice every 900 to 3,500 feet, depending on topography (Public Service Commission of Wisconsin 2011).

The conceptual design for the proposed underground transmission circuits assumes 11 separate splice vaults would be constructed for each circuit, for a total of 22 splice vaults (HDR 2013). Vault dimensions would be approximately 10 feet by 30 feet and 10 feet high. They would have two chimneys constructed with manholes which workers would use to access the vault interior for cable pulling, splice installation, and periodic inspection. Covers for the manholes would be flush with the finished road surface or ground elevation. Vaults would be either prefabricated and transported to the site in two pieces, or constructed onsite (HDR 2013).

Where suitable deep soils occur, backhoes most commonly would be used to dig trenches for the duct bank and vaults. Blasting may be required in shallow, rocky settings. Where the transmission lines would be constructed in unpaved areas, all shrubs and trees would be cleared in the area to be trenched for approximately 25 feet on each side of the centerline. Jack and bore construction would be used in areas where open trench construction is prohibited by major existing features such as railroads, waterways, or other large facilities or utilities. For the route selections studied, no such obstructions are currently anticipated. When bedrock or subsoils primarily consisting of large boulders are encountered, as would be the case for at least some of the proposed sites, blasting would be necessary. Small controlled blasts would fracture the rock, with little to no fly rock rising from the site. The blasts would create a short-term boom (less than 0.5 second), resulting in a short-term localized change in noise levels and ground vibrations.

Cable pulling and splicing would occur after the duct banks and vaults are completed. A typical setup is to position the supply reel trailer at the transition structure, or at one vault and position pulling winch equipment at the next vault. Cables would be individually pulled through the duct bank between vaults, or from the transition structure to the nearest vault. Cables are usually pulled in the direction of higher elevation to lower elevation (Public Service Commission of Wisconsin 2011).

230-kV single-circuit duct bank under construction, Longmont, Colorado

115-kV single-circuit duct and termination structure in open space in Jefferson County, Colorado

Exposed sections of conduits, duct bank, and backfill constructed for 230-kV single-circuit in Longmont, Colorado

Interior of a vault, before cable installation, for 230-kV single-circuit transmission line in Denver, Colorado

Figure 2.2-10 Examples of Underground Transmission Line Construction

The connections between overhead and underground lines would require mounting porcelain cable terminations on special single-pole steel structures, also known as transition structures. These structures would be approximately 100 feet tall and 5 feet wide at the base (HDR 2013). They would each accommodate three cable terminations, with relatively wide separations, to meet the electrical code safety requirements of the overhead line. Two transition structures would be required at each termination site for the proposed double-circuit transmission line. Alternatively, cable terminations may be located in an enclosed, fenced, secured area with two customary single-pole dead-end structures. This approach would reduce the visibility of the cable terminations and yield simpler construction and inspection access.

Disturbed areas would be restored with topsoils that were excavated and stockpiled during construction or with new topsoil. Permanent surface monuments would be installed to mark the easement centerline, and to document the presence of the duct bank beneath. Any infrastructure impacted by the construction Project such as roadways, driveways, curbs, and private utilities would be restored to their previous function, and yards and pastures vegetated as specified in landowner easements. Post-construction, trees, large shrubs, or any woody vegetation would not be allowed within a 75-foot ROW for underground sections of the line. Some herbaceous vegetation and agricultural crops may be allowed to return to the ROW.

2.3 Activities Common to All Action Alternatives

This section describes those activities that would occur with any of the action alternatives, though each alternative would have some differences based on the site-specific conditions encountered (e.g., the type of terrain crossed, vegetation types, and availability of existing access roads). Conventional, aboveground construction methods would be used exclusively under Alternatives A, B, C, D, and Variant A1, and would be used in combination with underground construction methods under Variants A2 and C1. Western would maintain electrical service during construction and also would keep the fiber optic communications system in service.

The transmission line ROW would be both aerially and ground surveyed along its centerline. The survey data would be used during the design phase to determine structure locations and heights needed to meet the transmission line design criteria for conductor clearances.

SCPs would be employed to minimize potential adverse effects during construction activities (see Section 2.5, Standard Construction Practices).

Western's standard construction specification requires the construction contractor to have a Safety and Health Program and to take necessary precautions to protect the safety and health of employees and members of the public, and to prevent damage to public and private property. Prior to the start of construction, the construction contractor would be required to submit its Safety and Health Program to Western for approval. At a minimum, the Safety and Health Program would be required to include designation of an on-site superintendent, safety and health policy statements, provisions for first aid and medical care of any injured employees, provisions for employee training, fire protection, health and sanitation facilities, procedures for specific sequences of work to ensure adequate activity hazard analysis, provisions for use of personal protection equipment, procedures for protecting the public, company policy and procedures for enforcing safety and health regulations, procedures required by Occupational Safety and Health Administration (OSHA) 1926, Subpart D (Occupational Health and Environmental Controls), inspection program, fall protection policy and program, and provisions for line-clearance tree trimming operations per OSHA 1910.269.

The construction contractor would be required to keep roads open without unreasonable delays and to provide and maintain suitable detours. The construction contractor would abide by conditions in the USFS operations and maintenance plan as well as the stipulation within their contract with Western. Protection of the public would be provided as required by OSHA 1926, Subpart G, "Signs, Signals, and

Barricades," by utility industry standards specific to transmission line construction and maintenance, and by the public agency having law enforcement jurisdiction for the roadway.

2.3.1 Acquisition of Land Rights

To access, construct, and maintain the Project, Western would need to obtain easements for some segments of the transmission lines or access roads. In order to select specific structure locations, a combination of aerial and ground surveys, environmental and engineering field studies, and geologic investigations would be necessary. Western would request rights-of-entry from landowners prior to entering areas where it does not have an existing easement. Western would select final sites to minimize effects to the properties crossed and to satisfy design criteria, such as maintaining adequate conductor-to-ground clearance. Western would compensate for or repair any damage to fences or other property caused by the surveys and studies.

Western would negotiate and purchase any additional necessary easements from landowners under Federal property acquisition guidelines (the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970 and its regulations, located at 42 U.S.C. § 4601 et seq. and 49 CFR Part 24). A qualified real estate appraiser would appraise the easement at fair market value. The appraiser would determine the value of the easement using customary appraisal methods, including analysis of available market data and comparable sales, and by taking into consideration the rights being acquired from the landowner. The appraiser would invite the landowner(s) to accompany him/her during the property inspection. Landowners could then identify any property features and uses believed to be of importance in determining the value of the easement. Western would present landowners with a written offer and a contract to purchase the required easements. Western's realty specialist would explain the contract and discuss the basis for payment. Once the conditions of the agreement are met, the transaction would be processed. Western would make full payment for easements to landowners, and would pay for any title insurance and all recording fees.

If Western and a landowner are unable to agree on purchase of an easement, Federal and state laws enable Western to acquire property rights for facilities to be built in the public interest through eminent domain proceedings. During the proceedings, a court would determine the compensation that Western would pay to the landowner.

When construction on a particular ROW is ready to begin, Western would advise the landowner(s) of the construction schedule. Western would make reasonable attempts to take into account the use and condition of the land to minimize any inconvenience. Western would compensate landowners for crop and property damage that occurs as a result of construction or maintenance of the transmission line. If a landowner believes that damage has occurred and has not been recognized, he or she could contact the Western realty specialist.

The landowner would retain title to the land over which Western's easement crosses, and would be able to continue using that land for activities that do not interfere with Western's use of the ROW. These uses may include parking, cultivation, and livestock grazing, among others. Activities typically not permitted in transmission line ROWs are those that pose a safety risk, reduce ground-to-line clearance, interfere with access to the line for maintenance, or jeopardize the integrity of the support structures. Buildings and structures may not be erected in the ROW because they could impede the safe operation of the transmission line or interfere with access for maintenance. For safety reasons, equipment that can extend higher than 14 feet, such as dump trucks, cranes, derricks, bale wagons, and stack movers, should not be used around transmission structures and lines (per NESC guidelines). Likewise, pumps, wells, and flammables must not be placed in a ROW. Properly grounded and permitted fences are acceptable as long as adequate gates for access have been installed.

2.3.2 Access Considerations

Regardless of the alternative selected, Western would need access to each structure site to construct and maintain the new transmission line and/or remove the existing line. Western would utilize existing access that was developed during the construction of the existing lines to the extent possible. Where existing access is inadequate for line removal or new construction, Western would need to improve existing access or establish new access from the nearest existing road or spur road to each structure site.

At some locations where there are existing roads, improvements may be needed to provide the necessary degree of access. Western would reconstruct or recondition roads only to the extent that it is necessary to provide access for construction equipment. Native material would be the primary source of road fill needed. Aggregate would be used only when needed to reduce further impacts to the road prism or as called for by specific engineering activities (e.g., for culvert installations).

It should be noted that new structures would not be specifically sited until the transmission line is designed following completion of the EIS and issuance of a ROD. After new structure sites are identified, Western would consult with landowners and the USFS on the location of new access routes needed for construction and maintenance. Western would conduct cultural and biological surveys along the access routes identified, and document the results in reports. Western would only authorize construction of new access routes following receipt of appropriate USFS, SHPO, and USFWS approvals or concurrences, as well as obtaining easements for access.

In order to minimize road building, Western would consider overland access where topography, soil, and vegetation conditions support overland travel with minimum disturbance and compaction. In this case, although an access road may not be constructed, an easement access would still be obtained. In most cases, where slopes are less than 15 percent, Western would not need to establish new access roads. Instead, access would be by travel within the ROW from the closest existing access road or spur road, resulting in temporary disturbances. Western would expect vegetation to recover quickly at these locations because it would not be graded or cleared.

For alternatives that propose to consolidate ROWs (Alternatives A, B, and C, the variants, and the APA), permanent access would be needed on the ROW where the consolidated double-circuit transmission line would be rebuilt. Only temporary access would be required to remove the existing single-circuit line from the ROW that would be abandoned. In areas with steep and rough slopes, temporary access to structures that need to be removed would be accomplished by foot, tracked vehicle, or all-terrain vehicle (ATV). Alternative D would rebuild single-circuit lines on both existing ROWs, and permanent access would be needed to each structure on both the North and South lines.

Table 2.3-1 provides estimates of the lengths of temporary and permanent access improvements needed for removal of the existing line and new construction under each of the action alternatives.

Table 2.3-1 Temporary and Permanent Access Requirements by Alternative

Access Type*	A	A1	A2	B	C	C1	APA	D
Temporary access for decommissioning the existing line only (miles)	7.1	7.1	7.1	7.1	8.2	8.2	7.9	0.1
Permanent access for long-term maintenance of rebuilt line (miles)	5.6	5.7	5.9	6.8	5.5	4.8	7.2	11.3

* Estimated mileage is for access spurs from existing state, county, private, or USFS roads.

2.3.3 Access Requirements on National Forest System Land

2.3.3.1 National Forest System Roads

USFS roads that provide access to Western's existing ROWs are all classified as Maintenance Level 2 (ML2). ML2 is assigned to roads open for use by high clearance vehicles where passenger car use is not considered. No change in classification is proposed for any USFS road. However, under Alternative C and Variant C1, Western proposes to reconstruct sections of USFS Road 122, to allow for passage of semi-trailer trucks to structure locations. Under this alternative, grinding, chipping, or blasting could be used to level the grade on the west end of Pole Hill Road. Use of imported aggregate would be limited and would be used only when needed to achieve proper grades for haul. Alternatives A, B, D, and the APA and Variants A1 and A2 propose either no improvements to USFS roads or limited reconditioning to remove ruts post-construction. Western's SCPs would be applied as appropriate (see Section 2.5, Standard Construction Practices).

The length of USFS roads where road reconstruction or limited road reconditioning is proposed is summarized by alternative in **Table 2.3-2**.

Table 2.3-2 National Forest System Road Reconstruction or Reconditioning

Road Category	A, A1, and A2	B	C and C1	APA	D
Unimproved system road (miles)	1.4	0.4	0.0	0.4	0.4
Limited reconditioning of existing ML2 system road post-construction (miles)	2.2	3.2	0.2	3.8	3.2
Reconstruction of existing ML2 system road for construction (miles)	0	0	3.4	0	0

2.3.3.2 Permanent Access

Permanent access between USFS roads and structure sites is needed to reach the rebuilt line on either one ROW (Alternatives A, B, C, and variants) or two ROWs (Alternative D). The roads Western currently uses for access to the transmission lines would continue to be used to the extent feasible. Where existing access is inadequate or does not reach new proposed structure locations, new permanent access roads are proposed. Permanent access roads are proposed to be classified as ML2 and Traffic Service Level “C.” Western would recondition/reconstruct roads only to the extent that it is necessary to provide access for construction and maintenance equipment. The proposed designation is for administrative use only. During the design phase, Western would consult with the USFS on access road alignments, the potential use of gates or other means to prevent unauthorized access, and conduct biological, wetland and cultural surveys for any new roads not previously surveyed. If necessary, Western would obtain the appropriate permits from the USACE.

2.3.3.3 Temporary Access

Temporary access for line decommissioning on National Forest System land would utilize Western's existing access roads, existing non-system two-track, and overland travel, wherever possible for each of the alternatives. New temporary access roads would have a design width of 10 feet, and Western would construct temporary access roads only to the extent that it is necessary to provide access for four-wheel drive trucks. After implementation is complete, new temporary access roads would be obliterated and revegetated as needed.

2.3.3.4 Road Decommissioning

Alternatives A, B, C, and the variants propose to rebuild the transmission line as a double-circuit line on one of two existing ROWs. The other ROW would be decommissioned by removing structures, insulator bundles and crossarms, and conductors, and revegetating the ROW as needed. After the ROW is decommissioned, Western's existing or temporary access to that ROW on National Forest System land also would be decommissioned. Access decommissioning may consist of providing for proper drainage and allowing the access route to naturally revegetate. It also may involve more active restoration methods such as scarification and reseeding, depending on local site conditions. Additionally, blocking access to unauthorized travel also would be considered, as negotiated with the USFS.

2.3.3.5 Access by Alternative

The miles of permanent and temporary access on National Forest System lands for line removal and new construction under each of the action alternatives and variants are summarized in **Table 2.3-3** below.

Table 2.3-3 Access on National Forest System Lands by Alternative

Road Category	A, A1, and A2	B	C and C1	APA	D
Permanent Access (Administrative Designation)					
Existing Western access designated for administrative use (miles)	0.4	0.2	0.2	0.2	0.6
New administrative road for permanent access (miles)	0.9	0.6	0.6	0.6	1.9
Temporary Access					
New temporary road for line decommissioning (miles)	0.4	0.9	0.9	0.9	0.0
Temporary access by non-system two-track (miles)	0.6	0.5	0.5	0.5	0.0
Temporary access by overland travel (miles)	0.3	0.3	0.3	0.3	0.0
Decommissioning					
Existing Western access to be decommissioned (miles)	0.2	0.3	0.3	0.3	0.0

2.3.4 Construction Staging Areas on all Lands

Existing substations and their immediate surroundings would be used to the extent possible for equipment staging, material laydown, and storage facilities. This would apply to all lands and alternatives. Additionally, Western anticipates that two 62,500-square-foot temporary staging areas (approximately 3 acres, combined) would be necessary to support implementation of any action alternative. The location of staging areas would be determined by the construction contractor during the construction phase; staging areas would be sited in accordance with Western's SCPs (see **Table 2.5-1**) and would be located at sites previously disturbed where practical and not on USFS land. Existing or portable concrete batch plants would be used to supply poured concrete for foundations for transmission line structures. In accordance with the SCPs, staging areas would be surveyed, as necessary, for cultural and other resources prior to disturbance.

2.3.5 Existing Line Removal on all Lands

The construction contractor would determine how to remove existing structures. Landowners would be consulted to determine if structures would be cut off at ground level or completely removed. Generally, structures would be lowered to the ground and stripped of hardware, arms, and braces. The conductor would be removed and coiled up prior to "laying" down existing structures or coiled up after the structures have been removed from the ROW. Pulling sites may be needed to pull the conductors. The construction contractor would have the option to remove guy anchors or cut them off 30 inches below ground level. In areas with steep topography or poor access, wood-pole structures may be dropped and given to the landowners or left in place, removed by dragging with a drag line, or removed by other means. If poles are left in place, they would be flush cut at ground and left on-site in the ROW in long sections or bucked up.

Construction waste materials would be collected, hauled away, and recycled or disposed of at approved sites. Often old utility poles are offered to landowners for their use. All disturbed areas not returned to agricultural cultivation would be reseeded to minimize erosion and the invasion of noxious weeds. All disturbance areas would be restored to their original condition as feasible. Damaged roads, gates, fences, or landscaping would be repaired.

The contractor would be required to prepare and implement a safety program in compliance with appropriate Federal, state, and local safety standards and requirements, and as approved by Western.

2.3.6 Clearing and Grading on all Lands

Crews would remove trees and shrubs from the structure location and along the ROW as necessary to provide access for construction equipment and activities. Methods for vegetation clearing and debris disposal are described in detail in **Appendix B**. Vegetation removal for ROW maintenance is described in Section 2.6.

2.3.7 Structure and Conductor Installation on all Lands

Direct embedded single-pole steel structures are proposed for Alternative A, Variant A1, Alternatives B, C, and the APA. A truck-mounted or track-mounted auger would be used to excavate holes for the structures. The steel poles would be assembled at the pole sites, or portions of the poles may be assembled at the staging areas and then hauled to the sites. The structures would be lifted into place with cranes or helicopter and held in place while concrete trucks backfill the excavation, filling the hole around the structure.

If site conditions or design requirements indicate a need, single-pole structures that bolt to a foundation would be used. The foundations would be constructed by installing rebar cages and anchor bolt cages in the excavated holes. Concrete would then be poured into the formed foundation to secure these cages in place. The fully assembled steel poles would then be bolted to the foundation anchor bolts. Excess soil would be spread evenly around the base of the poles and revegetated or removed from the site.

For Alternative D, which involves wood pole structure replacement, holes would be augered for new structure poles. Approximately 10 percent of the total structure height plus an additional 2 feet of each structure would be placed underground (e.g., a 70-foot-tall structure would have approximately 9 feet underground). Construction crews would assemble new structures within the ROW, and then position the structures into augered holes using cranes. Dirt from the excavations would be used to backfill around the new poles and to fill in the holes from the removed structures. Excess dirt would be spread near the pole and leveled with existing topography or removed from the site.

Assembly of transmission line structures would occur on site where insulators, braces, and other equipment would be attached to the structures while they are still on the ground. Boom trucks and cranes would be used to raise the structures into the foundation bore holes.

The Project would require level sites approximately every 2 to 3 miles along the transmission line to house reels of transmission cable and to serve as staging areas for wire-pulling. Western would try to avoid locations that require grading or removal of vegetation. The conductor pulling, sagging, and clipping operations would take place after the structures are in place. The conductor would not touch the ground during stringing or tensioning. Pulleys would be attached to the insulators to string the conductors, which then would be pulled to the appropriate tension. Contractors would use either a ground vehicle or helicopter to install the pulling cable. Where necessary, traffic would be slowed or alerted while activities are occurring that could affect public safety.

Conductor pulling is limited by reel size; typically, a conductor of the required diameter can be loaded onto reels in 10,000- to 15,000-foot segments. Most disturbance during this phase of construction would occur within the existing or expanded ROW. However, at some locations (e.g., at pulling and tensioning sites near an angle in the alignment) areas outside the ROW may be disturbed during construction.

2.3.8 Site Cleanup and Restoration on all Lands

Crews would remove construction debris and other materials from construction sites following construction and dispose of it in a certified private, public, or construction and demolition landfill, as appropriate. Where appropriate, usually areas with compactive soil types or where compaction would cause a problem, crews would loosen and level disturbed soil areas with harrowing or disking to approximate preconstruction contours. Ruts and scars that would interfere with overland travel would be filled or recontoured. Disturbed areas would be reseeded and mulched, as needed, using an approved mix as soon as practical after construction activities are completed in any given area. On National Forest System lands, an approved seed mix would be used for restoration. In some areas, mulching, netting, or turf reinforcement mats may be necessary to protect seeded areas from erosion. If used, mulching would consist of weed-free hay or other approved material. Private lands would be reseeded in consultation with private landowners. Periodically, crews would monitor disturbed or revegetated areas for erosion and to determine if site restoration is adequate. Areas may be reseeded as necessary to establish cover.

Drainage structures and other improvements not needed for permanent maintenance of the transmission lines would be removed. Similarly, access roads or trails that are not needed for ongoing maintenance access would be blocked and reclaimed, as negotiated with the USFS or private landowners.

2.3.9 Workforce on all Lands

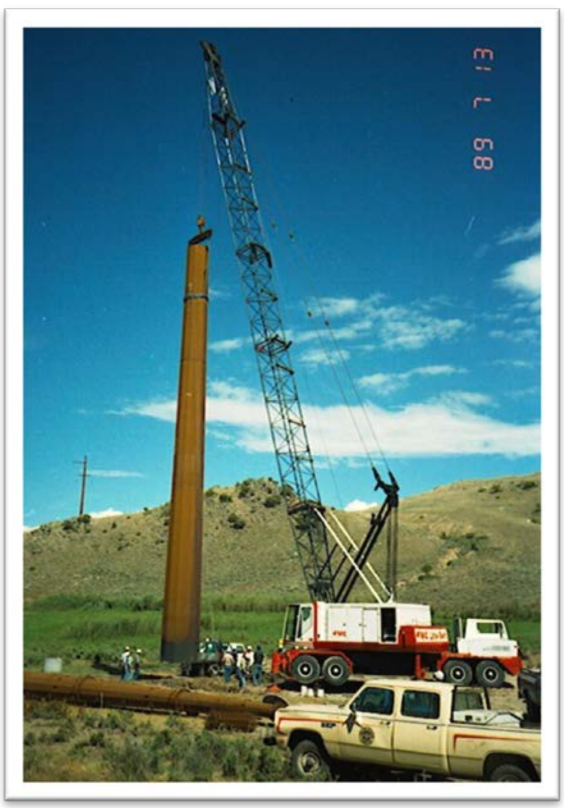
The workforce would typically be a combination of local labor acquired by contractors, and a mobile labor workforce that specializes in transmission line construction and temporarily relocates to the area where the work necessitates. Construction would be accomplished by two or three crews of five to six persons each. The construction contractor would determine the nature and make-up of the workforce.

2.3.10 Construction Sequencing on all Lands

The transmission line rebuild is expected to take eight to twelve months to complete. **Table 2.3-4** lists the typical sequence of construction activities for overhead transmission line and the equipment needed for each task. Photos of typical overhead construction methods are provided in **Figure 2.3-1**. Underground construction methods applicable to Variant A2 and Variant C1 are described in Section 2.2.4.

Hauling structure on an access road

Auger drilling for structure base



Setting a structure base

Setting the top of a structure

Figure 2.3-1 Examples of Overhead Transmission Line Construction

Table 2.3-4 Construction Activities and Equipment

Task	Equipment
Surveying	Utility vehicles, pickups, ATVs
Access	Graders, caterpillars, dump trucks, water trucks
ROW Clearing	Brush hogs, mowers, chain saws, skidders, bulldozers
Staging	Flatbeds with cranes, delivery trucks, pickups
Excavation	Backhoes, rotary drilling rigs, augers, cement mixers, pickups, ATVs, portable compressors
Structure Assembly	Cranes, material trucks, carryalls, pickups
Structure Placement	Cranes, boom trucks, pickups, semi-trailer trucks, helicopters
Cable Pulling	Boom trucks/man lifts, reel trailers, hydraulic tensioning equipment, pickups, helicopters
Cleanup	Flatbeds, dump trucks, pickups
Restoration	Seeding equipment, hand-seeding equipment, caterpillars, backhoes, flatbeds, pickups

2.3.11 Construction Disturbance and Monitoring on all Lands

During construction, a construction inspector (Western employee or hired independent contractor) would be present in the field to ensure implementation of SCPs and Project-specific design criteria (Section 2.5.2). An estimate of short-term disturbance areas associated with transmission line construction and access routes are provided in **Tables 2.3-5** and **2.3-6**. Long-term disturbance for structure bases would be less than 0.1 acre for any alternative.

Table 2.3-5 Summary of Short-term Disturbance for Transmission Line Construction by Alternative

Project Component	Disturbance Area	Short-term Disturbance by Alternative (acres)						
		A/A1	A2	B	C	C1	APA	D
Structure installation	11,350 square feet per structure	18 - 24	15 - 20	20 - 26	19 - 25	15 - 21	19-26	56 - 65
Conductor stringing sites	0.25 acre per site	1 - 3	1 - 2	1 - 3	1 - 3	1 - 2	1-3	2 - 5
Staging areas	2-3 sites; 5 acres per site	10 - 15	10 - 15	10 - 15	10 - 15	10 - 15	10-15	10 - 15
Removal of existing H-frame structures	9,500 square feet per structure	45	44	45	45	44	45	41
Pulling sites for line removal	0.25 acre per site	1 - 3	1 - 2	1 - 3	1 - 3	1 - 2	1-3	2 - 5
Underground construction	9 acres per mile	NA	24	NA	NA	25	NA	NA
Total		75 - 90	95 - 108	77 - 92	75 - 90	96 - 108	76-91	112 -132

NA = not applicable.

Table 2.3-6 Summary of Short-term and Long-term Surface Disturbance for Access Routes

Disturbance Type	A	A1	A2	B	C	C1	APA	D
Short-term disturbance for temporary access (acres)	7	7	7	7	8	8	8	0
Long-term disturbance for permanent access (acres)	10	10	11	13	10	9	13	21

* Assumes 8-foot-wide access route for temporary access and 15-foot-wide access route for permanent access.

2.3.12 Operation and Maintenance Activities Common to All Alternatives

Operation and maintenance of the lines would be the responsibility of Western. Throughout the life of the Project, Western would conduct the following operation and maintenance activities:

- Routine aerial inspections of the integrity and condition of the transmission lines, and after wind, ice, and lightning events that cause forced outages. Aerial line patrol is recognized as the most efficient and cost effective method to customers for maintaining the electric power grid. Western maintains and operates their helicopters under Federal Aviation Regulations Parts 135, 133, and 91 as is applicable to the mission being flown.
- Ground inspections once per year, and as needed after weather events, to identify any repair or routine maintenance needs. Maintenance activities would include repairing damaged conductors, insulators, or structure components. Western could conduct climbing inspections on transmission line structures if aerial or ground inspections find problems.
- Maintenance of access roads for Western's use, including surfacing, adequate drainage to reduce erosion damage, and removing downed trees and/or branches.
- Removal of trees and brush that create access, safety, or clearance problems for operation of the transmission lines, and noxious weed control as described in Section 2.6 below.

2.4 Comparison of Alternative Costs

A comparison of estimated life-cycle costs for the nine end-to-end alternatives by region is provided in **Table 2.4-1** below. The west, east, and central regions are portrayed in **Figure 2.2-8**. Estimated construction costs take into account the terrain, construction difficulty, length of line, and escalation for projected construction date. Estimated construction costs do not include costs for planning, lands and rights, environmental surveys and compliance, geologic investigations, designs and specifications, or construction supervision. The number of acres of land to be acquired for new or expanded ROWs is subsequently estimated in **Tables 2.8-1**, **2.8-2**, and **2.8-3**. Land acquisition costs in **Table 2.4-1** are based on a market analysis completed by Western to determine landowner compensation and land acquisition costs, including: acquisition labor costs, surveys, legal review, title policies, appraisals, and possible condemnations.

Table 2.4-1 Preliminary Transmission Line Cost Estimates by Alternative[1,2,3,4,5]

	Alternative ($ millions)								
West Region	**A**	**A1**	**A2**	**B**	**C**	**C1**	**APA**	**D**	**No Action**
80-year construction cost	5.6	5.9	32.1	6.1	5.6	31.0	5.6	17.6	19.2
80-year maintenance cost	0.3	0.3	0.2	0.3	0.3	0.1	0.3	1.0	1.0

Table 2.4-1 Preliminary Transmission Line Cost Estimates by Alternative[1,2,3,4,5]

West Region	Alternative ($ millions)								
80-year vegetation management cost	0.4	0.4	0.2	0.6	0.5	0.2	0.5	0.9	0.9
Total 80-year life cycle cost	6.4	6.6	32.5	7.0	6.4	31.3	6.4	19.5	21.1
Easement acquisition cost	1.1	0.8	0.8	0.0	0.0	0.6	0.0	0.9	0.9
Total	**7.5**	**7.4**	**33.2**	**7.0**	**6.4**	**32.0**	**6.4**	**20.5**	**22.0**
	Alternative ($ millions)								
Central Region	**A, A1, A2**			**B**	**C, C1**		**APA**	**D**	**No Action**
80-year construction cost	5.8			5.8	5.8		5.8	17.6	19.3
80-year maintenance cost	0.4			0.4	0.4		0.4	1.0	1.0
80-year vegetation management cost	0.6			0.6	0.6		0.6	1.1	1.1
Total 80-year life cycle cost	6.7			6.7	6.7		6.7	19.6	21.4
Easement acquisition cost	0.3			0.3	0.3		0.3	0.3	0.3
Total	**7.0**			**7.0**	**7.0**		**7.0**	**19.9**	**21.7**
	Alternative ($ millions)								
East Region	**A, A1, A2**			**B**	**C, C1**		**APA**	**D**	**No Action**
80-year construction cost	7.5			5.2	5.8		5.2	16.6	18.4
80-year maintenance cost	0.5			0.4	0.5		0.4	1.1	1.1
80-year vegetation management cost	0.6			0.6	0.7		0.6	1.2	1.2
Total 80-year life cycle cost	8.6			6.2	7.0		6.2	18.9	20.7
Easement acquisition cost	0.5			0.1	0.5		0.1	0.5	0.5
Total	**9.0**			**6.3**	**7.5**		**6.3**	**19.4**	**21.2**

[1] 80-year costs include maintenance and replacement costs.
[2] 80-year overhead transmission line costs for Alternative D includes replacement costs after 40 years due to use of wood structures.
[3] 80-year underground cost estimates include replacement cost of the dielectric cables after 40 years.
[4] No Action construction costs include construction costs associated with moving sections of the North Line off onto new ROW as described in Section 2.2.1.1.
[5] No Action construction costs include construction cost for line rebuild within the next 10 years due to existing status of aging wood structures, in addition to replacement costs after 40 years due to use of wood structures.

2.5 Environmental Project Safeguards

Standard construction practices, project design criteria, and environmental protection measures are requirements for the construction, maintenance, and decommissioning activities regardless of which alternative is chosen and presented in the ROD. These actions all were developed or mandated to avoid or reduce impacts to resources, and they are required for implementation of the Project on USFS lands.

2.5.1 Standard Construction Practices

Western has SCPs, including standard operation and maintenance practices that avoid or minimize impacts to the environment to the greatest extent practicable. Design criteria are actions or measures integrated into the Project design to avoid, minimize, reduce, or eliminate adverse effects as a result of implementing the action alternatives. For the Estes-Flatiron transmission lines rebuild, Western's SCPs identified in **Table 2.5-1** would be implemented for the construction of any action alternative. These measures are part of Western's Project and are incorporated into all impact assessments in this EIS. Maintenance activities under the No Action Alternative may be performed by a Western maintenance crew, rather than by a construction contractor; however, SCPs would still apply.

Table 2.5-1 Western's Standard Construction Practices

Ref. #	Standard Construction Practices
SCP 1	The contractor shall limit the movement of its crews and equipment to the ROW, including access routes. The contractor shall limit movement on the ROW to minimize damage to grazing land, crops, or property, and shall avoid unnecessary land disturbance.
SCP 2	When weather and ground conditions permit, the contractor shall obliterate contractor-caused deep ruts that are hazardous to farming operations and to movement of equipment. Such ruts shall be leveled, filled, and graded, or otherwise eliminated in an approved manner. In hay meadows, alfalfa fields, pastures, and cultivated productive lands, ruts, scars, and compacted soils shall have the soil loosened and leveled by scarifying, harrowing, discing, or other approved methods. Damage to ditches, tile drains, terraces, roads, and other features of the land shall be corrected. Before final acceptance of the work in these agricultural areas, ruts shall be obliterated, and trails and areas that are hard-packed as a result of contractor operations shall be loosened, leveled, and reseeded. The land and facilities shall be restored as nearly as practicable to their original conditions.
SCP 3	Water bars or small terraces shall be constructed across ROW and access roads when needed to prevent water erosion and to facilitate natural revegetation.
SCP 4	The contractor shall comply with applicable Federal, state, and local environmental laws, orders, and regulations. Prior to construction, supervisory construction personnel and heavy equipment operators will be instructed on the protection of cultural and ecological resources.
SCP 5	The contractor shall exercise care to preserve the natural landscape, and shall conduct its construction operations to prevent any unnecessary destruction, scarring, or defacing of the natural surroundings in the vicinity of the work. Except where clearing is required for permanent works, construction roads, or excavation operations, trees, native shrubbery, and vegetation shall be preserved and shall be protected from damage by the contractor's construction operations and equipment. To the extent practicable considering the need to protect transmission lines from encroaching vegetation and vegetation hazards (especially trees) edges of clearings and cuts through tree, shrubbery, or other vegetation would be irregularly shaped to soften the visual impact of straight lines within the ROW.

Table 2.5-1 Western's Standard Construction Practices

Ref. #	Standard Construction Practices
SCP 6	On completion of the work, work areas shall be scarified or left in a condition that would facilitate natural revegetation, provide for proper drainage, and prevent erosion. The contractor would repair damages resulting from the contractor's operations. Newly created access roads will be left to revegetate to height that still allows vehicle passage.
SCP 7	Construction staging areas shall be located and arranged in a manner to preserve trees and vegetation to the maximum practicable extent. Staging areas will not be placed within wetlands, including fen wetlands, riparian communities, or in proximity to surface waters. On abandonment, storage and construction buildings, including concrete footings and slabs, and construction materials and debris shall be removed from the site. The area shall be regraded as required so that surfaces drain naturally, blend with the natural terrain, and are left in a condition that will facilitate natural revegetation, provide for proper drainage, and prevent erosion.
SCP 8	Borrow pits shall be excavated so that water will not collect and stand. Before being abandoned, the sides of borrow pits shall be brought to stable slopes, with slope intersections shaped to carry the natural contour of adjacent undisturbed terrain into the pit or borrow area, giving a natural appearance. Waste piles shall be shaped to provide a natural appearance. No waste piles will occur on National Forest System lands.
SCP 9	Construction activities shall be performed by methods that will prevent entrance, or accidental spillage, of solid matter contaminants, debris, other objectionable pollutants and wastes into streams, flowing or dry watercourses, lakes, and underground water sources. Pollutants and waste include, but are not restricted to refuse, garbage, cement, concrete, sanitary waste, industrial waste, oil and other petroleum products, aggregate processing tailing, mineral salts, and thermal pollution.
SCP 10	Dewatering work for structure foundations or earthwork operations adjacent to, or encroaching on, streams or watercourses, shall be conducted in a manner to prevent muddy water and eroded materials from entering the streams or watercourses by construction of intercepting ditches, bypass channels, barriers, settling ponds, or by other approved means. Dewatering shall comply with applicable state requirements.
SCP 11	Excavated material or other construction materials shall not be stockpiled or deposited near or on stream banks, lake shorelines, or other watercourse perimeters where they can be washed away by high water or storm runoff, or can encroach upon the actual watercourse itself.
SCP 12	Waste waters from construction operations shall not enter streams, watercourses, or other surface waters without the appropriate permits and proper implementation of applicable permit conditions, including but not limited to use of turbidity control methods as settling ponds, gravel-filter entrapment dikes, approved flocculating processes, or other approved methods. Waste waters discharged into surface waters shall be essentially free of settleable material. For the purpose of these practices, settleable material is defined as material that will settle from the water by gravity during a 1-hour quiescent detention period.
SCP 13	The contractor shall use practicable methods and devices that are reasonably available to control, prevent, and otherwise minimize discharges of air contaminants.
SCP 14	The emission of dust into the air will not be permitted during the handling and storage of concrete aggregate, and the contractor shall use methods and equipment as necessary for the collection and disposal, or prevention, of dust. The contractor's methods of storing and handling cement and pozzolans shall include means of controlling air discharges of dust.
SCP 15	Equipment and vehicles that show excessive emissions of exhaust gases due to poor engine adjustments, or inefficient operating conditions, shall not be operated until repairs or adjustments are made.

Table 2.5-1 Western's Standard Construction Practices

Ref. #	Standard Construction Practices
SCP 16	The contractor shall prevent nuisance to persons or damage to crops, cultivated fields, and dwellings from dust originating from his operations. Oil and other petroleum derivatives shall not be used for dust control. Speed limits shall be enforced, based on road conditions, to reduce dust problems.
SCP 17	To avoid nuisance conditions due to construction noise, internal combustion engines shall be fitted with an approved muffler and spark arrester.
SCP 18	Burning or burying waste materials on the ROW or at the construction site will be permitted if allowed by local regulations. The contractor shall remove all other waste materials from the construction area. All materials resulting from the contractor's clearing operations shall be removed from the ROW. No waste materials can be buried on National Forest System lands.
SCP 19	The contractor shall make necessary provisions in conformance with safety requirements for maintaining the flow of public traffic, and shall conduct its construction operations to offer the least possible obstruction and inconvenience to public traffic.
SCP 20	Western will apply necessary mitigation to eliminate problems of induced currents and voltages onto conductive objects sharing a ROW, to the mutual satisfaction of the parties involved.
SCP 21	Structures will be carefully located to avoid sensitive vegetative conditions, including wetlands. If roads would cross wetlands, crossings occur at a feasible location for the construction contractor and in an area where the least amount of damage would occur to the wetland community. If necessary, Western would obtain the appropriate permits from the USACE.
SCP 22	No disturbance of vegetation will occur within 100 feet of a stream, except for hazard trees. No fueling, staging or storage areas would be placed within 100 feet of wetlands, streams or riparian areas. Where possible, vehicles should avoid crossing hydric soils.
SCP 25*	Disturbed areas not needed for maintenance access will be reseeded using mixes approved by the land management agency.
SCP 26	Erosion control measures will be implemented on disturbed areas, including areas that must be used for maintenance operations (access ways and areas around structures).
SCP 27	The minimum area will be used for access ways (generally 12 to 16 feet wide, except where roadless construction is used).
SCP 28	Leveling and benching of structure sites will be the minimum necessary to allow structure assembly, erection, and maintenance.
SCP 29	ROW will be located to use the least steep terrain.
SCP 30	Careful structure location will ensure spanning of narrow flood prone areas.
SCP 31	Structures will not be sited on potentially active faults.
SCP 32	Structure sites and other disturbed areas will be located at least 100 feet, where practical, from rivers, streams (including ephemeral streams), ponds, lakes, and reservoirs.
SCP 33	New access ways will be located at least 100 feet, where practical, from rivers, ponds, lakes, and reservoirs.
SCP 34	At crossings of perennial streams by new access ways, culverts of adequate size to accommodate the estimated peak flow of the stream will be installed. Construction areas will minimize disturbance of the stream banks and beds during construction. The mitigation measures listed for soil/vegetation resources will be performed on areas disturbed during culvert construction.

Table 2.5-1 Western's Standard Construction Practices

Ref. #	Standard Construction Practices
SCP 35	If the banks of ephemeral stream crossings are sufficiently high and steep that breaking them down for a crossing would cause excessive disturbance, culverts will be installed using the same measures as for culverts on perennial streams, and the applicable USACE permits would be obtained.
SCP 37*	Power line structures will be located, where practical, to span small occurrences of sensitive land uses, such as cultivated areas. Where practicable, construction access ways will be located to avoid sensitive conditions.
SCP 38	ROW will be purchased at fair market value and payment will be made of full value for crop damages or other property damage during construction or maintenance.
SCP 39	The power line will be designed to minimize noise and other effects from energized conductors.
SCP 42*	Before construction, Western will perform a Class III (pedestrian) cultural survey on areas to be disturbed, including structure sites and new access ways. These surveys will be coordinated with the appropriate landowner or land management agency, the SHPO and Indian tribe if on tribal lands. The survey reports and recommendations will be reviewed with the SHPOs and other appropriate agencies. Western's Standard Operating Procedure is to avoid all culturally sensitive sites. If not possible, specific mitigation measures necessary for each site or resource will be determined. Mitigation may include careful relocation of access ways, structure sites, and other disturbed areas to avoid cultural sites that should not be disturbed, or data recovery.
SCP 43	The contractor will be informed of the need to cease work in the location if cultural resource items are discovered.
SCP 44	Construction activities will be monitored or sites flagged to prevent inadvertent destruction of cultural resource for which the agreed mitigation was avoidance.
SCP 45	Construction crews will be monitored to the extent possible to prevent vandalism or unauthorized removal or disturbance of cultural artifacts or materials from sites where the agreed mitigation was avoidance.
SCP 46	If cultural resources that were not discovered during the Class III survey are encountered during construction, ground disturbance activities at that location will be suspended until the provisions of the NHPA have been carried out.
SCP 47	Construction activities will be monitored or significant locations flagged to prevent inadvertent destruction of paleontological resource for which the agreed mitigation was avoidance.
SCP 48	Clearing for the access road will be limited to that necessary to permit the passage of equipment, and the safe construction, operation and maintenance of the line.
SCP 49	The access road will follow the lay of the land rather than a straight line along the ROW where steep topography would result in a higher disturbance.
SCP 50	For any water withdrawals and uses totaling over 1/10th (0.10) acre-foot in the South Platte River drainage, the construction contractor shall ensure that water needed for the project (for dust control, concrete mixing, etc.) will be supplied from an already-permitted existing depletion source, or the contractor shall successfully complete the appropriate consultation process with the U.S. Fish and Wildlife Service.

* Western's SCPs 23, 24, 36, 40, and 41 are not applicable to this Project and are not included in this table.

2.5.2 Project-specific Design Criteria or Construction Practices

The design criteria below were developed to minimize or avoid impacts to avian species, special status wildlife and plants, and minimize visual effects of vegetation management. The following Project-specific design criteria apply to all action alternatives:

2.5.2.1 Avian Wildlife

- Western will design and construct the transmission line in conformance with the Suggested Practices for Avian Protection on Power Lines (Avian Power Line Interaction Committee [APLIC] 2006).
- The siting of structure locations and/or timing of construction related activities will adhere to Colorado Parks and Wildlife (CPW) 2008 *Recommended Buffer Zones and Seasonal Restrictions for Colorado Raptors*. When distance buffers are not possible because of Project proximity, seasonal restrictions will be implemented.
- Avian nesting surveys will be conducted prior to construction to ensure ground disturbing activities do not result in the “take” of an active nest or migratory bird protected under the MBTA. If construction occurs during the avian breeding season (roughly between March 15 and September 1), surveys will be conducted no earlier than 72 hours prior to any ground disturbing activities to ensure the Project complies with the MBTA.

2.5.2.2 Visual Resources

- Clumps or islands of trees will be left in openings created by danger tree removal (where sagging lines and ground clearance are not a concern) to break sight distance and to maintain natural-appearing landscape mosaic pattern.
- Western will limit the use of foliar application of herbicide to reduce creation of large areas of browned vegetation.
- At road crossings, highway or visual overlooks, Western will leave sufficient vegetation, where possible, to screen views of the ROW.
- Additional vegetation management information is located in **Appendix B**.
- Western will treat unnatural-appearing soil disturbances by smoothing piles of soil created by machinery or any other soil disturbance from machine piling within 100 feet of areas requiring Partial Retention Visual Quality Objective/Moderate Scenic Integrity Objective or higher. Areas may include scenic byways, hiking or multi-use trails, camping areas, other areas of moderate to high use recreation, or any other areas of visual significance.
- At locations where visibility from sensitive viewpoints is a major concern, structures with a shorter average height (85-foot) and shorter span length could be utilized. The shorter design would result in roughly twice the number of structures in a given length of ROW in order to meet required conductor clearances. The feasibility of using shorter structures, and the location of these structures and spans will be determined during the design phase of the Project.

2.5.2.3 Special Status Wildlife and Plants

- Prior to Project implementation, Western would conduct pre-construction surveys along portions of its preferred alternative, including access roads not previously surveyed, to identify sensitive species habitat or populations, and occurrences of noxious weeds. If special status individuals or populations are discovered, Western would develop mitigation to minimize effects in consultation with the USFS and appropriate natural resource agencies.

2.5.3 Project-specific Environmental Protection Measures

In addition to Western's SCP's and Project-specific design criteria, the following EPMs are integrated into the Project. The following EPMs apply to all action alternatives:

- During construction, a construction inspector (Western employee or hired independent contractor) would be present in the field to ensure implementation of SCPs and Project-specific design criteria (Section 2.5).
- Noxious weed surveys would be conducted prior to Project implementation on new proposed alignments along the APA that were not surveyed in 2011. Survey information collected during pre-construction surveys per the specific design criteria would include species name, Global Positioning System (GPS) location of weed infestations, percent cover, and approximate size of weed infestations.
- Western has committed to additional plant surveys and appropriate consultation for all applicable species with the USFWS and USFS along the selected alternative prior to construction.
- A noxious weed management plan would be developed to specify general weed prevention and control methods to be implemented pre-, during, and post-construction. Techniques would include education of construction and operation personnel, and post-construction monitoring. Control of noxious and invasive species would include, as needed, selective herbicide spraying or other chemical, physical, and biological methods consistent with the State of Colorado, Larimer County, and USFS regulations and guidance.
- Where permanent facilities or structures would be located, the entire topsoil horizon (layer) would be salvaged for use in reclamation, prior to greater surface disturbance. Additionally, prior to any trenching, the topsoil would be salvaged and stockpiled separately from subsoil, for later use in reclamation.
- Construction, excavation, or re-spreading with frozen or saturated soils would be prohibited or minimized to the greatest extent practicable. Implementation of this measure would avoid or reduce impacts to soils due from uneven settling, compacted surfaces, and physical crusts that would reduce water infiltration.
- Roads would be inspected as part of routine line inspections and remediation / restoration conducted as needed based on those inspections.
- During reclamation and decommissioning, compacted areas (typically any area that received repeated traffic or three or more passes by heavy equipment) would be decompacted by subsoiling, paraplowing, or ripping along the contour to the depth of compaction. Soils would be decompacted only where needed, and where decompaction would result in greater net benefits to helping seedbed preparation, encouraging infiltration, and reducing accelerated erosion than would occur without it. Scarification would only be used on shallow soils.
- To protect stored or stockpiled soils from losses to wind and water erosion, soil piles left in place for more than one week would be protected using the appropriate best management practices (mulch, tackifier, cover crop, etc.).
- As site-specific planning and design proceed, Western would locate foundations to avoid domestic water supply and septic systems. Western would ascertain the need for blasting to construct foundations in areas where hard, near-surface bedrock occurs alongside domestic water supply and septic systems. Where blasting would be required under such conditions, Project structure foundations would be located as far from domestic infrastructure as possible, and a blasting control plan would be developed and implemented to minimize adverse effects on underground water systems. Western would address any damage claims appropriately, verifying damages and restoring the function of individual or local water supply or septic systems, as needed.

- As part of final design and engineering, wetland surveys would be conducted along the selected alternative ROW to identify any potential wetlands and fens located on site. Where potential wetland features are identified within the ROW, survey information collected would include wetland type, type and cover of hydrophytic and riparian vegetation species present, site hydrology, GPS location of the wetland boundaries and adjacent ROW footprint, and associated information required to determine jurisdictional status through consultation with the USACE. If wetlands or fens are identified on National Forest System lands, in addition to the consultation with the USACE as described in SCP 21, appropriate USFS wetlands staff would be consulted.
- If wetlands are identified within the selected alternative ROW, boundaries of avoidable features would be staked in the field to guide construction activities. Where wetland features cannot be avoided through site design, wetland construction techniques would be applied for any construction within wetlands. Wetland construction techniques could include: not removing existing structures in wetlands and riparian areas, cutting off existing structures at the base; or the use of timber mats, erosion controls, and the placement of equipment outside of the wetland and waters of the U.S. boundaries. Wetland construction techniques and best management practices would be reviewed and approved by the USACE.
- Western proposes to conduct additional plant surveys as described in the Project-specific design criteria (Sections 2.5.1.3, Special Status Wildlife and Plants) above. If known federally listed plant species or USFS-identified sensitive plant species are encountered, an avoidance plan would be created and implemented in consultation with a USFS Botany Representative to avoid or minimize impacts, as appropriate.
- Rocks, brush, and woody debris will be salvaged to the extent practicable and replaced to approximate pre-Project visual conditions on graded structure pads, staging areas, and temporary access routes that are decommissioned post-construction. This would re-establish the pre-disturbance surface character following construction and accelerate long-term reclamation of graded pads, staging areas, and temporary access routes.
- To the extent possible, Western will utilize non-specular conductors and non-reflective coatings on insulators. This would reduce glare from transmission conductors and insulators.
- Appropriate color treatments will be used for steel monopole transmission towers to the extent practicable. Similarly, surface treatments for transmission structures will repeat and/or blend with the existing colors of the surrounding landscape to the extent practicable. This measure describes two such examples.1) Grey galvanized steel will be utilized east of Bald Mountain to Flatiron substation where they will be seen against an olive-colored sagebrush and mountain mahogany backdrop. 2) Where transmission structures will be silhouetted against the sky from most viewpoints (such as above The Notch), galvanized structures will be selected to minimize color contrasts. Such galvanized steel monopoles poles and davit arms will receive a non-specular treatment to dull their reflectivity and reduce glare. [Note: Since the publication of the Draft EIS, Western has determined that it would use dulled galvanized steel structures for the entire project. The latest field experience information from the utility industry on self-weathering structures indicates that ongoing corrosion weakens these structures, therefore shortening their expected service life. For this reason, and the fact the Forest Service prefers dull galvanized steel, self-weathering steel structures would not be used for this project.]
- If at any time during this Project, possible human remains are discovered, Western's Archaeologist and the USFS Arapaho-Roosevelt National Forest (USFS) Archaeologist will be notified immediately (no later than 24 hours after the discovery) by telephone and email. Work of all types will halt immediately within 300 feet of the remains and reasonable protective measures will be employed until such time as appropriate agency personnel, the Colorado State Archaeologist, the Larimer County Sheriff, and/or the Larimer County Coroner can be notified and are able to determine the nature and significance of the remains.

2.6 Vegetation Management

Vegetation management practices to be implemented under the No Action and rebuild alternatives are described below. Additional information is provided in **Appendix B**.

2.6.1 No Action Alternative

Under the No Action Alternative, Western would continue its infrastructure, ROW, and access road maintenance practices as they are currently defined under existing authorizations and other agreements. Due to increasingly more stringent NERC standards, Western must pursue ROW acquisition to allow for maintaining vegetation. Some of the existing transmission line ROWs do not have adequate space to maintain vegetation clearance distances and, therefore, do not comply with current NERC compliance standards.

The current management approach to controlling vegetation, ensuring access, and maintaining equipment is largely reactive and responds to maintenance problems when they occur. Methods to control vegetation are manual, mechanical, and chemical (herbicides).

Under the No Action Alternative, Western would continue its management approach for ROW, access, and transmission line maintenance. Because Western currently addresses routine vegetation maintenance and danger trees as defined in its authorization, it must survey the ROWs at least once a year to determine if new vegetation issues (including danger trees) have appeared and address them if needed. This focus requires annual re-entries, and in some areas more frequent re-entries, into the ROW to address vegetation problems that were identified during periodic line patrols. Western manages vegetation in transmission line and access route ROWs only, and would not authorize activities outside the ROW; however, removal of danger trees outside of the ROW is permitted if they pose an impending danger to the lines. The No Action Alternative includes the practice of spot application of approved herbicides, as do the action alternatives discussed below (see **Appendix B**). Western also performs access route repairs as needed. Transmission system maintenance activities would consist of regular aerial and ground patrols to find problems, schedule and perform repairs, and conduct preventative maintenance.

2.6.2 Proposed Vegetation Management for All Rebuild Alternatives

As part of the Estes-Flatiron Transmission Lines Rebuild, Western proposes to change the way it manages vegetation in the ROWs to a more proactive approach. This applies to each action alternative for the proposed transmission lines rebuild Project. Western proposes to manage its transmission line ROWs to better ensure the reliability and safety of the transmission lines, ensure adequate access for maintenance, protect the public, promote worker safety, and manage risk from fire, all while improving the protection of environmental resources.

For National Forest System lands, Western proposes to acquire new authorization along with the development of a new operation and maintenance plan to include a more proactive approach for managing vegetation along Western ROWs on National Forest System lands using an integrated vegetation management approach. This approach is based on the American National Standard Institute (ANSI) Tree, Shrub and Other Woody Plant Maintenance-Standard Practices (Integrated Vegetation Management, a. Electric Utility ROW (ANSI A300 (Part 7)-2006 IVM)). Western would proactively control vegetation growth and fuel conditions that threaten its transmission lines.

For private lands where new easements are needed, Western proposes to include provisions that would implement the more proactive approach for managing vegetation using an integrated vegetation management approach. Depending on the rebuild alternative and where existing easements are adequate for proposed transmission line rebuild, Western would implement the more proactive approach for managing vegetation within the ROW to the extent allowed by any restrictions included with the existing easements. Western's proposed approach to vegetation management is summarized below. A more detailed description is provided in **Appendix B**.

2.6.3 Categories of ROW Conditions and Vegetation Treatment Methods

Various vegetation management conditions and fuel loading are found along the existing transmission lines. For example, there are areas that need relatively little treatment, areas that need significant treatment to bring them to a desirable condition that could then be managed efficiently, and areas with mixed conditions. This is the result of a variety of past actions, including the extent of vegetation clearing along the ROWs when transmission lines were constructed; how these areas were subsequently managed over the years; maintenance practices over many years in a variety of vegetation types that could have contributed to excessive fuel loading in the ROWs; past danger-tree cutting; site conditions (e.g., slope, aspect, soil types, rainfall, pine beetle and other insect attacks, and diseases); tree species distribution; topography; and other variables.

Western has identified six broad categories of ROW conditions along the existing transmission lines. **Table 2.6-1** lists the six categories of ROW conditions and proposed treatment methods during initial construction as well as for ongoing maintenance. Photos illustrating typical ROW conditions associated with each category along the existing transmission lines are provided in **Appendix B**.

Table 2.6-1 Categories of ROW Conditions and Vegetation Treatment Methods

Category	Vegetation	Frequency of Treatment	Treatment Methods
1	ROW vegetation is compatible with the transmission line based on topography and/or presence of natural, stable, low-growing vegetation communities.	None expected, but ROW monitoring would be needed to ensure conditions have not changed.	None expected.
2	Fast-growing incompatible species that are not acceptable; over the long term, the vegetation is likely to include incompatible vegetation types that would require monitoring and treatment.	Initial treatment would occur with construction of the line. Maintenance treatments are expected to be relatively frequent (expected 2- to 6-year return intervals).	Accessible sites would favor use of mechanized equipment and removal of salvageable material. Inaccessible sites would favor use of hand felling.
3	Fast growing incompatible species of trees that are in an acceptable condition, but over the long term, Western would need to treat incompatible vegetation.	Initial treatment would occur with construction of the line. Maintenance treatments are expected to be relatively frequent (expected 2- to 6-year return intervals, but this would vary depending on site conditions).	Accessible sites would favor mechanized equipment, with removal of salvageable material. Inaccessible sites would favor use of hand felling.

Table 2.6-1 Categories of ROW Conditions and Vegetation Treatment Methods

Category	Vegetation	Frequency of Treatment	Treatment Methods
4	Slow-growing incompatible species of mature vegetation that is not acceptable, and in the long-term incompatible; vegetation treatments would be needed to control re-growth.	Initial treatment would occur with construction of the line. Maintenance treatments are expected to be relatively infrequent on sites with incompatible species with slow growth rates, perhaps 5 or more years, depending on site conditions.	On sites with good access, mechanized equipment would be favored and salvageable material would be removed. On sites with poor access, hand felling and other manual methods would typically be used.
5	These sites have slow-growing incompatible species, and the ROW condition is acceptable. However, over the long term, Western would need to monitor and treat the incompatible species.	Initial treatment would occur with construction of the line. Maintenance treatments are expected to be relatively infrequent, perhaps 5 years or longer, depending on site conditions.	On sites with good access, mechanized equipment would be favored and salvageable material would be removed. On sites with poor access, hand felling and other manual methods would typically be used.
6	Treatments in these areas of ROW are driven largely by the conditions of the fuel load. Typically, they include areas with low-growing vegetation types characterized by having high fuel loads. Sites are characterized by dense, woody vegetation capable of high-intensity fire, with transmission lines having relatively low conductor-to-ground clearances.	Initial treatment would occur with construction of the line. This could include mechanical removal of vegetation near structures and from areas of the ROW. Maintenance treatments as needed. Need is determined from ROW monitoring.	In areas with good access, mechanized treatment such as mowing would be favored. In areas with poor access, manual treatments would typically be used.

2.6.4 Establishing the Desired ROW Vegetation Condition During Construction

Western would assess current conditions in the ROW to identify areas that need initial treatments during construction based on the categories described above. Treatment of ROW vegetation during construction of new line would emphasize the following activities:

- Cut danger trees if any are present;
- Manage slash that has built up in the ROW to reduce fuels density;
- Grind or crush regeneration that has grown in the ROW to reduce the density of live, green fuels;
- Cut all Category 2, 3, and 4 incompatible species; and

- Allow small, slow growth tree species to remain in the ROW unless anticipated growth would threaten safe, reliable transmission line operation before the next maintenance period.

During construction of the transmission line, Western proposes to remove undesirable vegetation (typically trees) that would interfere with transmission line safety and reliability. The desired condition would be a ROW dominated by grasses, forbs, shrubs, and lower-growth tree species that would not interfere with the transmission line.

2.6.5 Maintaining Desired ROW Condition

Western's proposal includes monitoring and retreating ROW areas at appropriate intervals based on the results of reviews of ROW conditions during line patrols. In ROW areas with relatively low conductor-to-ground clearances, Western would typically retain lower-growth native plant species to maintain the desired vegetation condition. Western would do this through active management to remove tall-growth species. Depending on the specific site conditions, desirable native species could include grasses, forbs, and shrubs, and appropriately sized small or lower-growing tree species. Generally, more selective control methods can be used to maintain this condition along the ROW. ROW maintenance activities and treatment intervals would vary in the ROW depending on the success of previous treatments, vegetation type, rates of vegetation re-growth, environmental protection requirements, and risks to the transmission line.

An important component of ROW maintenance is fuels management to mitigate the risk of wildfires. Western would evaluate the risk to transmission line operations and security from wildfire and manage fuels in the ROWs. ROW fuel loads associated with vegetation re-growth or control treatments must be evaluated and controlled as needed. All vegetation (dead or live) can be considered fuel because it can contribute to fire intensity and duration. In addition to reducing the risk of incompatible vegetation in a ROW, Western's proposed ROW reclamation and long-term maintenance strategies would address areas where accumulated fuel poses an unacceptable risk. Western would reduce fuel density in ROWs using mechanical and manual treatment approaches, as described below.

There could be areas along the existing transmission lines that need no or minimal vegetation management – for example, some areas in canyons and drainages or other steep topography in which trees might not grow to heights or densities that would threaten the transmission line that crosses high above (see Category 1). In some of these areas, few if any control methods would be needed for years. In other vegetation communities, occasional removal of vegetation around structures could be needed to ensure access to the structures and to reduce the risk of fire to the transmission line structures. Regardless, Western would need to monitor all ROWs and access roads to continuously evaluate vegetation conditions and ensure they meet the management requirements, and that changed conditions have not resulted in unacceptable threats.

2.6.5.1 Vegetation Control Methods

Western proposes several general control methods, individually or in combination, to manage vegetation. These methods include a variety of control methods utilities typically use to manage their ROWs. Western would use the techniques to alter the vegetation condition so that it can be maintained more efficiently and effectively. The following paragraphs describe the general vegetation-control methods.

2.6.5.2 Manual Control Methods

Manual vegetation control includes the use of hand-operated powered tools and non-powered hand tools. Manual techniques—mainly using chainsaws—can be used where equipment access is limited by terrain, soil conditions, or other environmental conditions. One or two trucks carrying equipment and workers would drive along the access road to the appropriate site. Crews of two or more with chainsaws would then hike along the ROW and cut target vegetation. Crews often use ATVs instead of trucks. Crew sizes for this type of activity usually range from two to four.

2.6.5.3 Mechanical Control Methods

Mechanical vegetation control uses machine platforms with various interchangeable treatment-head attachments to remove or control target vegetation along transmission line and authorized access route ROWs. Rubber-tired mechanical equipment platforms are generally limited to operating on slopes less than 30 to 35 percent. Specialized tracked equipment platforms, with articulating control cabins, would be typically used on slopes up to 60 percent. Both types of specialized equipment platforms can operate with very low ground pressures. However, site-specific obstacles such as rocks or other extreme terrain conditions can reduce their efficiency. Mechanical operations would usually involve a crew of two to three.

2.6.5.4 Herbicides

Western would use spot application of herbicides approved for use to treat undesirable, mostly herbaceous vegetation, especially invasive species. Herbicides would be applied directly to the vegetation using a hand or powered sprayer. Herbicides would be used on incompatible vegetation that sprouts after initial treatment by cutting or mowing. Herbicide applications typically involve a crew of one to two.

Western uses herbicides that are approved for use in ROW maintenance and by the USFS. Herbicides would only be used in partnership with the USFS when on USFS lands. Western would use USEPA and state-registered herbicides, and appropriately licensed or certified applicators would apply the herbicides following the label requirements.

Herbicides can be applied in different ways, depending on the targeted plants, vegetation density, and site circumstances. Western proposes herbicide treatment either by spot application or localized (site-specific) application.

When making decisions about the use of these methods, Western considers the area being treated, the presence of sensitive plants and other environmental resources, the herbicide label requirements, and whether the method is cost effective and efficient.

2.6.5.5 Site-specific Herbicide Application

Site-specific or localized herbicide application is the treatment of individual or small groupings of plants. Western typically uses this application method only in areas of low to medium target-plant density. The application techniques include, but are not limited to, basal treatment, low-volume foliar treatment, and cut stump treatment.

2.6.5.6 Debris Disposal

Managing vegetation includes cleanup – the treatment of slash and debris disposal. Methods of disposing of vegetation debris generated when vegetation is cut include logging, chipping, lopping and scattering, and mulching. Pile burning would not occur on USFS lands. Methods of debris disposal on private lands would be in accordance with state guidelines. Where the lop and scatter method is employed, all debris created would be left on site and dispersed such that the depth does not exceed 24 inches in height, in order to reduce the fuel load. Each of these methods is described further in **Appendix B**.

2.6.5.7 Mechanical Fuel Reduction Methods

Western would reduce existing fuel loads through mechanical thinning, mowing, chipping, and debris removal. Western would use site-specific treatments to reduce potential impacts from wildfire on the transmission line ROW by reducing the likely intensity and duration of fires in the ROW. Western would use a range of mechanical and manual methods, depending on site conditions. These include tree removals, mechanical and hand thinning of small-diameter trees to reduce ladder fuels, mechanical mastication (e.g., grinding and chipping), and hand and mechanical piling. Hand or mechanical piling would not be conducted on USFS lands. Fuel reduction methods on private lands would be in accordance with state guidelines. The target fuels of these treatments include downed trees, slash, debris from past treatments, green fuels such as regenerated lodgepole pine, and brush such as Gambel oak.

Western would use prescribed burning on non-National Forest system lands and only under optimum conditions, such as during periods of minimal wind speeds or high moisture content in fuels, to reduce the risk of fire escape and impacts from smoke. Prescribed fire treatments could include mechanical piling and burning and broadcast burns to reduce surface fuels over larger areas. Large pockets of dead and down woody material and slash generated from mechanical treatments would be broadcast burned or piled and burned to further reduce fuel loadings.

2.7 Alternatives Considered but Dismissed

2.7.1 Alternative Alignments

In addition to the alignments carried forward for detailed analysis in the Draft EIS, several additional routing alternatives were identified and considered. Some of these potential alternatives emerged through a series of public workshops held in October 2012 that were intended to review the constraint/opportunity criteria and to solicit public comment on potential alternative alignments. Through this process, a wide range of potential routing alternatives were considered. Some of the potential routing alternatives were carried forward for detailed analysis, while others were eliminated following an initial consideration of their feasibility. Alternative alignments considered but eliminated, including the reasons for their elimination, are summarized in **Table 2.7-1** below.

Table 2.7-1 Alternative Alignments Dismissed from Detailed Analysis

Potential Reroute	Reason for Dismissal
U.S. Highway 34 and U.S. Highway 36 reroutes	Proposals to reroute the transmission line along U.S. Highways 34 and 36 would not use existing transmission line ROWs and would instead follow existing transportation ROWs. These proposals were not carried forward because they would greatly increase visual impacts, an important consideration in this area. These proposals would not resolve the issues raised during scoping, but simply displace impacts to new landowners and may require constructing an additional length of transmission line. Locating the lines along these routes also adds flooding as another possible major catastrophic future event that may affect the transmission lines.
Reroute west of Meadowdale Hills subdivision, on the east slope of Mount Pisgah	This potential route crosses steep, rocky slopes without any existing access roads, and would be difficult and costly to construct, and would result in substantial erosion risks as well as increased maintenance costs. Access road construction across this topography would require excessive cut and fill and increase visual impacts, and would potentially result in heightened safety concerns to maintenance crews.
Reroute to the south side of the North Line, below The Notch	This potential route is located in an area with steep slopes and poor access; it also follows a riparian corridor. Western's SCPs direct that structure sites, access ways, and other disturbance areas will be located at least 100 feet, where practical, from rivers and streams (including ephemeral streams). Because this route would be in difficult terrain and follows a riparian corridor it was not considered suitable for siting the transmission line.

Table 2.7-1 Alternative Alignments Dismissed from Detailed Analysis

Potential Reroute	Reason for Dismissal
Reroutes far to the south of the South Line in the vicinity of Pinewood Reservoir Stewardship Trust and Blue Mountain Bison Ranch	This routing strategy was suggested during workshops to reduce effects to recreational and residential viewsheds at Pinewood Reservoir. These reroutes were dismissed because they crossed protected lands, did not fully address the visual resource issue, and displaced existing impacts to new landowners. Some area residents suggested a reroute around the north side of Newell Lake View subdivision to reduce visual impacts to their community, and a routing option was identified and carried forward for detailed analysis (Alternative A).
A reroute that followed a gas pipeline between the North and South line on the east end of the Project area, between the access road to the Bald Mountain radio facility and the intersection of Pole Hill Road and Chimney Hollow Road	This reroute was suggested as a means to co-locate linear infrastructure. However, the reroute fails to effectively address other scoping issues related to visual impacts and would require new ROW acquisition resulting in new acquisition costs and subsequent new surface disturbance, as well as displacement of impacts to new landowners. There also may be additional mitigation required by the gas utility, if Western were to site a transmission line parallel to an existing gas line.
Reroute following Flatiron Penstocks (CBT Project)	In an effort to further consolidate linear facilities, consideration was given to an alignment that paralleled the penstocks that descend Bald Mountain to Flatiron Reservoir. The penstocks emerge aboveground well below the summit of Bald Mountain and follow an alignment that is prominent in the viewshed from Flatiron Reservoir, one that doesn't take advantage of the opportunities for concealment provided by the surrounding terrain. Steep and rocky terrain also would contribute to access concerns. Further, the penstocks are facilities that date to the 1940s and have a degree of historic significance.
Reroute along Cottonwood Creek	This reroute would extend from the vicinity of Flatiron Reservoir and follow an alignment to the northwest generally along Cottonwood Creek, rejoining the ROW of the existing North Line near Pinewood Lake Dam. This alternative would require several miles of construction through steep terrain with poor access. It was dropped in favor of Alternative A that avoided the Pinewood Lake viewshed and the adjacent subdivision in a more direct and effective manner.

2.7.2 Alternative Structure Types

In addition to routing options, alternative Project designs were considered and presented during the public workshops held in October 2012. Other structure types considered included lattice steel structures and double-circuit wood H-frame structures. Double-circuit wood H-frame structures are unconventional and rarely used by Western for reliability reasons. Western does not currently consider lattice steel structures or double-circuit wood H-frame structures a viable option. Neither the lattice nor double-circuit H-frame designs were carried forward for further analysis.

2.7.3 Other Alternatives

Other alternatives also considered but dismissed are discussed below.

2.7.3.1 Use of Olympus Tunnel

The Olympus Tunnel begins below Lake Estes and extends to the east through Mount Olympus, eventually meeting up with the Pole Hill Tunnel and other CBT Project facilities that extend all the way to Flatiron Reservoir. The possibility of placing an underground cable system within the Olympus Tunnel and other below ground facilities was identified as a potential opportunity, one that would reduce or eliminate visual impacts and other identified concerns. Although such systems have been installed in other water conveyance tunnels, including the Adams Tunnel through Rocky Mountain National Park, they are only feasible when the facility is specifically designed to accommodate the cables and splices at the time of its initial construction. Placing a cable within a tunnel not designed and constructed to accommodate one would diminish the capacity of the facility to deliver water and function as designed, and would also create considerable operational, scheduling, and maintenance challenges. As an example, water delivery would have to be suspended and the tunnel drained for any kind of cable maintenance. For these reasons, this alternative was not considered feasible, and it was dropped from further consideration.

2.7.3.2 Underground Construction near Pinewood Reservoir

Due to the sensitivity of the viewshed south of Pinewood Reservoir, underground construction was considered for a segment of the Project through this area, following the alignment of Alternative B. As discussed in Sections 2.2.4 and 2.4, underground construction presents a number of challenges, including greatly higher costs than conventional aboveground construction. The increase in cost needs to be weighed against the expected benefits, in this case an incremental decrease in visual impacts. Western also does not currently maintain any underground lines and therefore does not have the expertise, equipment, or replacement material to maintain an underground line. Any maintenance or repair would need to be contracted out, potentially resulting in longer outages. Alternative A would avoid the viewshed south of Pinewood Lake, providing an alternative that would eliminate these impacts at a much lower cost. For these reasons, underground construction at this location was dropped from further consideration.

2.7.3.3 Underground Construction on National Forest System Lands

Variant C1 would rebuild the transmission line underground from Mall Road east to the Roosevelt Forest boundary near the north end of the Meadowdale Hills subdivision. Western considered extending Variant C1 further east onto National Forest System lands, but dismissed that potential option based on the following technical reasons.

- Extending Variant C1 further east along the proposed alignment for Alternative C would involve costly trenching within a rocky rough section of Pole Hill Road that is noted for its recreational value to four-wheel drive users. Restoring Pole Hill Road to previous conditions following installation of cable trenches would not be possible, unless the cable trenches were buried deeper. Continued use of Pole Hill Road would impact the integrity of cable trenches.
- Terminating the underground section on National Forest System lands would require an underground service vault. This vault could not be located on Pole Hill Road and would require that the vault be located off the road. The installation of the vault would require the clearing of a large forested area to accommodate the vault installation and future access.
- Extending Alternative C1 along the existing South Line route would require extensive clearing within a mixed coniferous forest. The width of the clearing would need to accommodate the trench, a spoil pile, and a service road to accommodate the installation of the cable trench and service vault.

2.8 Agency Preferred Alternative

2.8.1 Determination of the Agency Preferred Alternative

After reviewing all of the material developed during the EIS process, including the summary of Western's purpose and need objectives, the impacts of the alternatives on Key Issues, and other environmental resource impacts, Western selected its preliminary APA and presented it to USFS representatives, who concurred. Western used a composite of alternative selections to create a complete APA. The APA and its corresponding regions as discussed below are depicted in **Figures 2.2-8** and **2.8 1**.

2.8.1.1 West Region

In the west region, Western selected Alternative C, a modification of the South Line, as the APA. Alternative C best meets Western's purpose and need objectives, and it generally minimizes impacts to the Key Issues.

Specifically, Alternative C both maximizes the use of adequate and accessible ROW while decommissioning the inadequate ROW and ROW on difficult terrain. Although this alternative would have visual impacts, on the whole Alternative C would offer the best visual resource advantages while also being the most cost effective.

The west region required more tradeoffs among Western objectives, Key Issues, natural resource impacts, and interested public preferences than the east or central regions. Underground alternatives were considered, and ultimately rejected primarily on the basis of cost effectiveness and total 80-year life cycle cost as compared to the expected incremental improvement to visual resources. Additionally, underground construction costs could increase by a factor of 2 or 3 depending on the time, equipment, and manpower to trench through rock formations. The absence of structures and overhead lines would be offset by a completely woody vegetation-free ROW above the buried lines. Depending on the viewer's location, either aboveground or underground could be considered better visually. Resource values directly related to visual impacts also were considered, including economic effects.

North Line alternatives (Alternatives A, A1, and A2) on the western end were not selected for the APA principally because all would need to get through the very difficult terrain in the vicinity of The Notch and Mount Olympus (though Variants A1 and A2 avoid Mount Olympus, those routes still pass through The Notch). While technically feasible, construction in this steep and rocky area would not meet Western's access, maintenance, reliability, cost, or safety goals. In addition, construction of access to structure sites in this area would require more miles of access roads in difficult terrain, resulting in more disturbance to natural resources, increased visual impact, ongoing raised risks of erosion and resource damage, and long-term expanded access road maintenance requirements. The possibility of moving from the South Line to the North Line west of The Notch was considered, but the South Line is high on a ridge by this point and crossing over to the North Line raised similar issues as constructing through The Notch. Additionally, any such route west of The Notch would have to cross the entire valley on a north-south axis in order to get to the North Line, directly across the views back to the east from Estes Park and Rocky Mountain National Park.

The remaining South Line alternatives were B or C. Western selected Alternative C, with its relocation away from and lower than U.S. Highway 36, to reduce the visual impact of the line as it approached its western terminus. Constructing the line south of U.S. Highway 36 (Alternative B) would require two line crossings of the highway and construction on steeper terrain, with more difficult and visually apparent access to each structure. Alternatives B and C would both traverse established neighborhoods, and the residents along these alternatives have been very clear that they would like to see the Project constructed elsewhere. However, Alternative C would make use of existing ROW that residential development was designed around, and no additional ROW in the residential areas would be required. West of the residential areas Alternative C would require new ROW in order to avoid crossing U.S. Highway 36 and eliminate the existing structures adjacent to the road. Other alternatives on both the North and South Lines would impact area residents as well. While Western would like to accommodate all interests and resources, inherent conflicts among them make tradeoffs and hard decisions inevitable.

2.8.1.2 Central Region

In the central region, Western generally selected the North Line, or Alternative C. Alternative C is usually the closest route to the existing Pole Hill Road in this area, and would minimize the amount of access road construction and related Project disturbance, and thus minimize impacts to natural resources. It also would consolidate the linear development in the central region. Due to topography, Pole Hill Road traverses back and forth, often crossing under one or both lines (Alternatives B and C). During design and engineering, the proposed APA route may take advantage of opportunities to reduce access road construction and/or reduce environmental impacts by switching from the North Line to the South and back where the lines are close together, and close to Pole Hill Road. Many landowners in the central region have expressed a preference for locating the line as close to Pole Hill Road as possible. The final decision on the actual transmission line route and pole locations would be made after initial design and engineering, and after discussions with land owners along the ROW.

The visual impact of the new single-pole, double-circuit transmission line would increase incrementally, but this would not be a new impact as there are two transmission lines present already. The portions of the North and South line ROWs not retained for the new line would be abandoned, offsetting the Project's overall visual impact. The North Line, Alternative C, would require the acquisition of more new transmission line ROW, while the South Line, Alternative B, has sufficient 110-foot-wide ROW. However, use of the South Line in certain locations may require more or longer access roads and associated ROW. The ability to move back and forth between the two existing line routes and ROWs to stay closer to Pole Hill Road would help reduce the need for new access roads.

Acquiring more access road or transmission line ROW is recognized as an impact to landowners. Western determined that the impact of acquiring new ROW along the North Line would be more than offset by the reduction in ground disturbance and related environmental impacts, shorter/better access roads, less need for new access road ROW, and the abandonment of existing South Line ROW. In those areas where portions of the South Line ROW would be used, impacts to both resources and landowners should result in less impact as compared with staying entirely on the North Line in the central region.

The transition point between the North and South lines on the east end is just east of Pole Hill Substation, where the APA would turn north from Alternative B or the South Line and head north to connect to Alternative C. On the west end the APA would transition from the North Line to the South Line just east of the western USFS boundary where the two existing lines start to diverge.

2.8.1.3 East Region

Western selected the South Line, Alternative B, for its APA on the east end of the Project. Alternative B both best meets Western's purpose and need, and avoids or minimizes impacts to Key Issues and environmental resources. The existing North Line would be removed on the east end and the ROW would be abandoned to revegetate or be used for the landowners' purposes. While the existing transmission line would be removed from the Newell Lake View subdivision, the ROW and one pole of the existing wood pole H-frame structures would be left in place to retain the fiber optic communications connection to Pinewood Reservoir Dam.

2.8.2 Rationale of the Agency Preferred Alternative

To select an APA, Western looked to the factors within its purpose and need statement that an alternative would have to satisfy (Section 1.4.1). Ideally, the selected APA best meets the purpose and need while having the least impact on the human environment. Alternatives that met the basic purpose and need requirements, but had less impact than an alternative that better met the purpose and need, were carefully considered for selection as the APA. However, alternatives that clearly did not meet purpose and need requirements were not considered for selection.

In addition to Western's purpose and need, Key Issues were developed in coordination with the Forest Service and as a result of public comment to compare the differences between the alternatives analyzed in detail. The Key Issues are described in Section 1.6.4.1 and include the following:

- Effects of new ROW acquisition;
- Effects of the Project on scenic travel corridors
- Effects of new road construction in areas with steep topography;
- Effects on recreational uses and experiences;
- Effects on protected areas; and
- Effects on existing infrastructure.

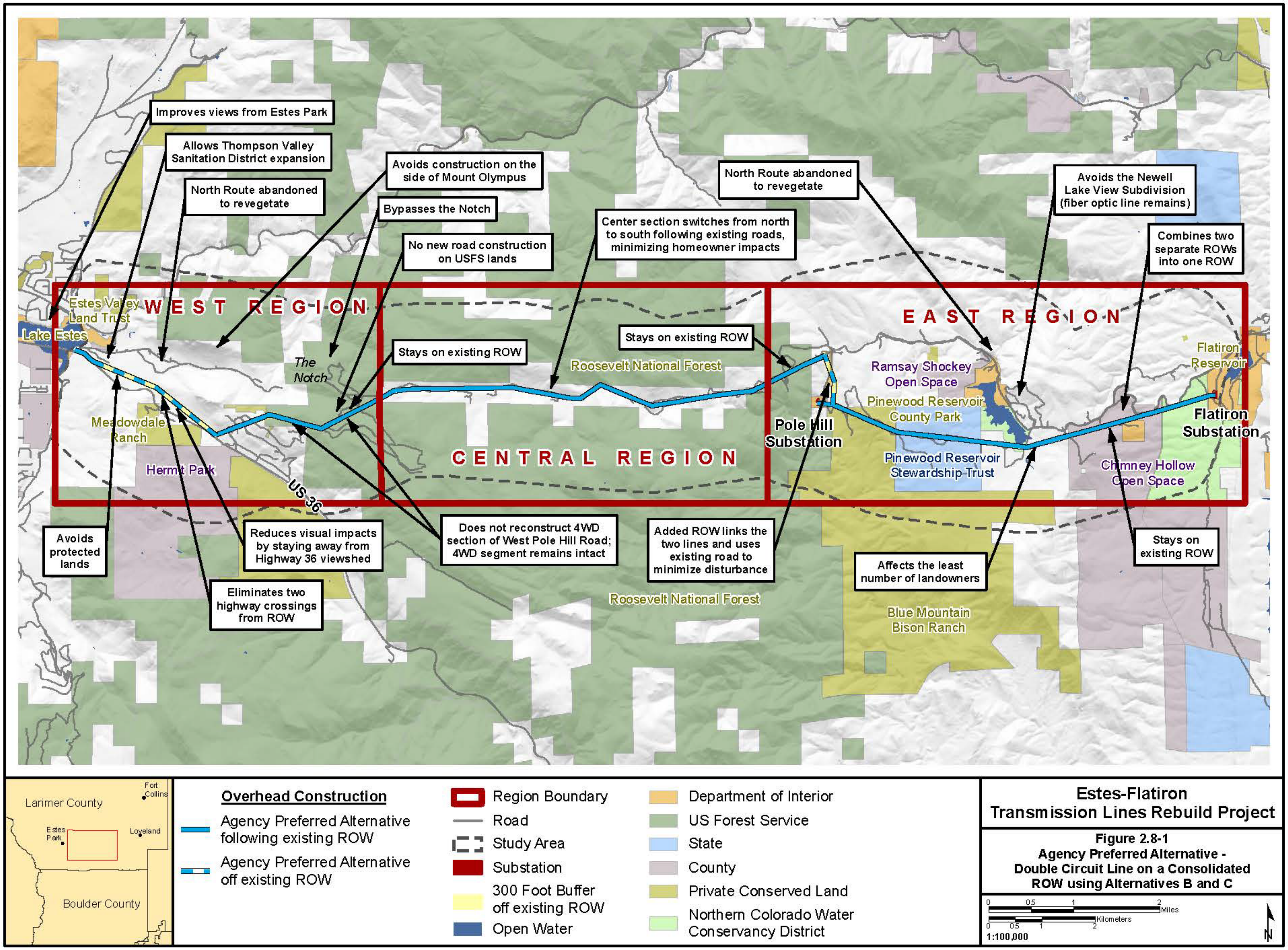
Key Issues and other issues are described below, each with a review of which alternatives best minimize effects. Western has in fact used portions of both existing routes and several analyzed alternatives to create the APA. Impact analysis based on Key Issues is portrayed for the full APA as well as the other alternatives in **Table 2.9-1**; however, in response to public comments, new summary impact tables were created for the Final EIS (**Tables 2.9-2** and **2.9-3**), which describe and compare the impacts at both ends of the Project separately without the influence of data from the rest of the line. The central region is the strip of private land in the middle of the Project area. The west region starts at the boundary of the Forest Service land and the west end of the private land in the central region. Similarly, the east region boundary is the east end of the private land in the central region where it abuts Forest Service. These boundaries closely match the locations where the North and South lines converge to transit the private land in the center of the Project Area, and diverge again once out of the central region (see **Figure 2.8-1**). This division of the data for end-to-end alternatives allows residents to compare localized data, and helped Western select the APA. Western believes the APA accomplishes Western's purpose and need while also considering public and agency comments and resource impacts along with other relevant factors.

The factors discussed below are all part of Western's purpose and need for the Project.

2.8.2.1 Western's Purpose and Need Factors

Reliability, including NERC Requirements

Western needs to replace the aging wood-pole lines that are increasingly at risk of failure. Poles and cross arms have been weakened by age, weathering, rot, and damage over the past 65 to 75 years of use. The conductors and hardware also are worn and in need of replacement. The existing lines are vulnerable to extreme weather and fire hazards. Western's need also includes being in compliance with NERC reliability standards. These standards include maintaining conductor clearances and safety through vegetation management and removal of "hazard trees." These are trees that could fall or grow into the line and take down conductors, contact conductors and cause an outage, or come close enough to energized conductors to cause arcing. Should an outage occur because Western was not in compliance with standards, Western could be subject to penalties, and potentially be liable for damages to landowners and utilities affected by the outage. Therefore, any alternative that does not allow for full compliance with NERC reliability standards would not be selected as the APA. Any alternative that would substantially increase the difficulty in achieving full compliance also would be less likely to be selected unless there were major offsetting purpose and need advantages and/or environmental benefits.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Improves views from Estes Park
Allows Thompson Valley Sanitation District expansion
North Route abandoned to revegetate
Avoids construction on the side of Mount Olympus
Bypasses the Notch
No new road construction on USFS lands
Center section switches from north to south following existing roads, minimizing homeowner impacts
North Route abandoned to revegetate
Avoids the Newell Lake View Subdivision (fiber optic line remains)
Combines two separate ROWs into one ROW
Stays on existing ROW
Stays on existing ROW
WEST REGION
CENTRAL REGION
EAST REGION
Estes Valley Land Trust
Lake Estes
The Notch
Meadowdale Ranch
Hermit Park
US 36
Roosevelt National Forest
Pole Hill Substation
Ramsay Shockey Open Space
Pinewood Reservoir County Park
Pinewood Reservoir Stewardship Trust
Flatiron Reservoir
Flatiron Substation
Chimney Hollow Open Space
Avoids protected lands
Reduces visual impacts by staying away from Highway 36 viewshed
Eliminates two highway crossings from ROW
Does not reconstruct 4WD section of West Pole Hill Road; 4WD segment remains intact
Added ROW links the two lines and uses existing road to minimize disturbance
Affects the least number of landowners
Stays on existing ROW
Roosevelt National Forest
Blue Mountain Bison Ranch
Larimer County
Fort Collins
Estes Park
Loveland
Boulder County
Overhead Construction
Agency Preferred Alternative following existing ROW
Agency Preferred Alternative off existing ROW
Region Boundary
Road
Study Area
Substation
300 Foot Buffer off existing ROW
Open Water
Department of Interior
US Forest Service
State
County
Private Conserved Land
Northern Colorado Water Conservancy District
Estes-Flatiron Transmission Lines Rebuild Project
Figure 2.8-1
Agency Preferred Alternative - Double Circuit Line on a Consolidated ROW using Alternatives B and C
0 0.5 1 2 Miles
0 0.5 1 2 Kilometers
1:100,000
N

Underground transmission lines have a very different outage profile from aboveground transmission lines: initially the risk of outage would be low, because these facilities are not subject to severe weather or vegetation-related outages. However, the risk of conductor failure in underground facilities increases over time and any outages are more difficult and time consuming to repair. Therefore, underground outage times when they do occur are much greater than most aboveground outages. Extended outages have greater hardship and financial impacts to consumers and businesses; most overhead line outages can be repaired in a matter of hours, while underground outages could last days or weeks. Western does not currently maintain any underground lines and therefore does not have the expertise, equipment, or replacement material to repair an underground line. Furthermore, any maintenance or repair would need to be contracted out for these alternatives, potentially resulting in longer outages.

All alternatives except the No Action Alternative would increase reliability. Alternative D, replacing both existing lines with in-kind new wood-pole structures, would be more reliable than the status quo, but the wood pole structures would still be at risk from wildfires. The rest of the alternatives, using steel monopoles, would be fire resistant (wildfires could still cause these lines to be de-energized due to the risk of flashover from conductive smoke), and would be designed to withstand the most severe weather conditions anticipated in the area.

In the west region, the underground portion of Alternatives A2 and C1 would be less susceptible to storm damage or vegetation-caused outages. However, in the event of an outage or cable failure, extended out-of-service outages would be required. In addition, extended outages also would be required while cables are pulled and replaced at approximately 40 and 80 years of service. Since Alternatives A and A1 would follow the North Line through the very difficult terrain in the area of The Notch and Mount Olympus, they would be much more difficult to access for repair of outages, maintenance, and vegetation management. Therefore, these aboveground alternatives in the west region of the Project would generally be less reliable due to access difficulties and length of outages; resulting in Alternatives B or C as the most reliable for the APA. Damage to overhead lines can be more quickly identified and repaired following outages on Alternatives B or C in the west.

In the east region, all alternatives except D or No Action would have similar reliability, although Alternative B would be preferable for the APA as a result of less steep terrain and easier access for repair of outages and for maintenance.

ROW Clearing and Vegetation Management

Vegetation management activities have been conducted along the existing lines since they were constructed. Western needs to improve vegetation management on the ROW, including dealing with hazard trees, to remain in compliance with more stringent recent NERC requirements and to reduce the number of vegetation management cycles and related costs and impacts of more frequent maintenance activities. Western's goal is a vegetation maintenance cycle of no less than 5 years (see **Appendix B** for specific practices). Constructing transmission lines in forested areas results in a more noticeable ROW due to clearing and increases the risk of danger trees falling into the line from outside of the ROW. ROW through shrub lands and grasslands is preferred to reduce those clearing and maintenance impacts. The existing North Line (Alternative A) has a ROW of only 20 to 30 feet which is inadequate for maintaining current line clearances. Alternatives that would be located through ponderosa pine and mixed conifer forest vegetation would require more ROW clearing and active vegetation management, as well as removal of danger trees outside of the ROW. Vegetation management is directly related to Maintenance and Access, as more favorable conditions for these two Western purpose and need factors also make vegetation management activities safer and easier to conduct. Alternative D and the No Action Alternative would require approximately double the miles of line and associated access road ROWs that would need to be treated and maintained, in addition to added clearing needed to expand the North Line ROW to 110 feet. Therefore, Alternative D and the No Action Alternative are the least desirable from the ROW clearing and maintenance perspective.

Any portion of Alternative A would require additional ROW to reach a 110-foot width, and thus more initial clearing.

On the west end of the line, the No Action Alternative and Alternatives D and Variant A1 would have the highest amount of acreage to be cleared or maintained. There is little difference between the remaining alternatives, including the APA. Alternative A, Variant A1, and Alternatives B, C, Variant C1, and the APA would require relatively the smallest acreage of trees to be cleared or maintained (**Table 2.9-3**).

In the east region , Alternative B would have the least number of acres of ponderosa pine vegetation that would need to be cleared or maintained; Alternatives B and C would have no acres of mixed conifer that would need to be cleared or maintained (**Table 2.9-2**). Alternative B on the east would be more favorable for the APA, with the smallest acreage of trees to be cleared or maintained.

<u>Maintenance</u>

One of Western's goals is to improve the maintenance profile of the transmission lines. The existing aging wood pole lines require an inordinate amount of maintenance, which is labor-intensive, expensive, and requires frequent access to the lines. Work includes repairing or replacing structures and hardware, vegetation management, and maintaining access. Western needs to reduce the amount of maintenance time and funds required to maintain the existing lines. Avoidance of sensitive soils (low revegetation potential, compaction-prone, and highly erodible by wind or water) would be preferred to minimize long-term maintenance requirements and reduce potential environmental impact. Avoidance of steep slopes and rocky areas to the extent practicable also would be beneficial by reducing the need for difficult access construction and maintenance on steep slopes and rock and the potential for erosion and related environmental impacts.

Alternatives with the least total miles and least new miles of access roads would be more advantageous, as more road miles are usually associated with the alternatives that minimize crossing steep slopes. However, miles alone can be misleading and actual steep and rocky areas need to be individually assessed.

Alternative D and the No Action Alternative would least meet the maintenance objective for the APA. Both alternatives would have twice as many line miles as other alternatives using double-circuit structures on one ROW. Alternative D would retain wood pole structures, and the No Action Alternative would require that old structures be replaced piecemeal or after storm or fire events. Both alternatives would remain on existing ROWs and would not improve existing maintenance conditions.

In the west region, Alternatives A, A1, and A2 all pass through very steep and rocky terrain, especially near The Notch and Mount Olympus, with difficult access and challenges to maintenance activities, making these alternatives undesirable. Alternative B also crosses steep and difficult terrain south of U.S. Highway 36. Alternative C on the west would be most efficient to maintain for the APA and would best meet Western's purpose and need.

In the east region, all Alternatives except D and the No Action would be similarly efficient to maintain. Alternative B on the east would be easiest to maintain for the APA because it crosses the least amount of sensitive soils which would reduce long-term access road maintenance requirements (**Table 2.9-2**).

<u>Access</u>

Access is closely related to maintenance; maintenance is facilitated by good access to transmission lines, and maintenance also is required to keep access roads in useable condition, and to minimize erosion. Presently, access is generally poor and vehicle access to many of the structures is not possible. Parts of both lines are almost inaccessible. Difficult access increases outage times if there is a problem on the lines. Western needs to improve access to each structure as part of the Project.

Alternatives that provide access to each structure while avoiding inaccessible areas, steep slopes, rocky areas, and compaction prone or erodible soils to the extent practicable would be favored over other alternatives. Other factors favoring selection for the APA include alternatives requiring the least miles of new and/or improved road, and those that avoid surface water or wetlands and other areas problematic for construction and maintenance.

The No Action Alternative and Alternative D would both require retaining existing ROWs and access to structures on both lines, and new access in some areas. These would be the least desirable alternatives as the amount of access needed would be far greater than the other alternatives (**Table 2.3-1**), and require more resources to maintain over the life of the Project.

In the west region, Alternatives C and C1 would be the most accessible, requiring the least miles of new administrative roads on National Forest System lands for permanent access (**Table 2.9-3**). Alternative C on the west end also would avoid difficult access and steep terrain crossed by Alternatives A, A1, A2, and B.

In the east region, all alternatives except D and the No Action would have no new Forest Service roads needed for permanent access. Additionally, on the east end of the line, Alternative B would be easiest to access because it crosses the least amount of sensitive soils (**Table 2.9-2**). This makes it more favorable for the APA.

<u>Safety</u>

Safety is interrelated with Maintenance and Access. Safety risk increases with steep and/or rocky terrain, difficult access, deteriorated structures, and climbing versus man-lift procedures. Longer lines have a higher safety risk than shorter ones, due to the greater number of structures and larger workload. Maintenance activities that are more challenging and more frequent, and that require more man-hours of activity, would increase safety risks to maintenance personnel. Difficult access to the lines and the need for more access maintenance also increase the safety risk to field personnel. Any alternative that would reduce the difficulty of either maintenance or access would improve safety and lower the risk of injuries.

The No Action Alternative would be the least desirable alternative for safety concerns, because existing access is poor in some areas and many structures are badly deteriorated and require replacement. The segment of the North Line through the Newell Lake View subdivision would be relocated regardless of alternative, thus improving safety for residents; however, one pole of each structure would be left to carry the fiber optic communication service connection to Pinewood Reservoir Dam. Widening the ROW on the North Line would meet current safety standards and improve safety for both residents and maintenance personnel.

Alternative D would require more maintenance over time compared to other action alternatives because the new structures would be of the wood pole type, and there would be approximately twice as many of them. Wood pole lines also would increase the risk of both fire ignition and damage from fire, with attendant increase in safety risk to residents and fire crews. Alternatives using double-circuit monopoles would need far less maintenance over the life of the Project, and so would be substantially safer than either No Action or Alternative D. However, the steel pole alternatives would differ somewhat in safety risk, with alternatives crossing steep terrain and/or requiring more challenging access having a higher level of risk. The risk of fire ignition or damage from fire would be greatly reduced compared to wood pole lines, and the taller steel poles would be further from vegetation and much stronger and more resistant to adverse weather events.

Underground Alternatives A2 and C1 would presumably require little maintenance until cable replacement was needed at 40 and 80 years. Maintenance personnel would not be familiar with underground cable replacement, so there could be a slight increase in safety risk during those replacement events.

In the west region, Alternative D and No Action would have the highest safety risks resulting from a combination of difficult access, increased length of the line, and wood pole structures that are more susceptible to fire and damage than steel poles. Additionally, steep terrain associated with Alternatives A, A1, A2, and B would contribute to increased safety risks. Alternative C on the west end would be the shortest in length when compared to the No Action and remaining action alternatives (with the exception of Alternative B) and would generally avoid steep terrain, resulting in the lower worker maintenance and safety risk, making it more suitable for the APA.

In the east region, Alternative D and No Action would have higher safety risks resulting from a combination of difficult access, increased length of the line, and wood pole structures that are more susceptible to fire than steel poles. Alternative A would cross through difficult terrain causing safety concerns during maintenance. Alternatives B or C would be better alternatives on the east end in terms of reducing safety risks for the APA by avoiding difficult terrain and lessening the amount of man-hours required for maintenance.

<u>Wildfire</u>

Wildfire has two components: the risk to the transmission lines from wildfires, and the risk of the transmission line initiating a wildfire. Western needs to minimize the risk of both components. For example, in September 2010, the Reservoir Road Fire put the L-LT 115-kV transmission line in danger; wooden poles were damaged, and the line had to be de-energized twice over several days during firefighting operations. From the perspective of initiating fires, utilities that do not maintain NERC reliability standards and cause a wildfire are increasingly being held liable for resulting damages.

Wood-pole transmission lines are vulnerable to wildfire because fires can damage or burn down the structures and cause an outage. They also are more likely to fail from severe weather and cause ignition of a fire, especially as they age and deteriorate. Alternatives that utilize steel pole structures would greatly reduce the risk of damage from wildfires and risk of initiating wildfires.

The No Action Alternative with its old wood-pole structures would be the worst alternative for reducing wildfire risks. Alternative D would replace the structures on both lines, reducing the risk of structure failure and ignition, but the new wood pole structures would still be subject to damage during a wildfire. All steel pole double-circuit alternatives would have superior resistance to damage from severe weather or age, would minimize the potential fire ignition, and would have the greatest protection from wildfires. The underground Alternatives A2 and C1 would be the least affected by wildfires, and would not pose an ignition hazard except at the transition structures at either end.

In the west region, the No Action Alternative would have the highest risk of damage from wildfires, and of causing wildfires through structure failure and possible ignition. Alternative D would have the next highest risk. Alternatives utilizing steel monopoles would all have low wildfire risks, as would the underground Variants A2 and C1. Additionally, Alternatives A, A1, A2, and B, all pass through very steep terrain with difficult access causing challenges to responding to wildfires, making these alternatives less desirable. Alternative C would be the better alternative on the west end.

In the east region, the No Action Alternative would have the highest risk of damage from wildfires, and of causing wildfires through structure failure and possible ignition. Alternative D would have the next highest risk. Alternatives utilizing steel monopoles would all have low wildfire risks. Alternative A could have a slightly higher risk than the other steel monopole lines only because of the more difficult access. Alternatives B and C would be the better alternatives on the east end.

<u>Cost Effectiveness</u>

The cost of Western's projects and operations are almost entirely supported by power revenues and customer funding, not taxpayer dollars. However, Western has a responsibility to its customers and their retail consumers to minimize costs. These costs are passed through to customers and ultimately borne by the consumers. Several factors must be considered to determine which alternative would be most cost-effective. It may be intuitive that the shortest route with the least miles of access roads should be the least expensive. However, if the shortest route traverses solid rock, or if access roads are in steep areas, this may not be the case. Long-term maintenance costs also have to be considered. For example, it may be more cost efficient in the long run to have more miles of access roads on flatter ground than fewer miles on steeper ground. Similarly, it may be initially more expensive to install steel poles than wood, but the extended life span and reduced maintenance costs could show steel poles to be the best investment.

In the case of this Project, for Alternative D both existing wood pole lines would need to be reconstructed, doubling the line miles of construction costs and maintenance. While often less expensive to construct, wood pole lines require more maintenance as they age than do steel pole lines.

ROW purchase costs also have to be considered. It is less expensive to remain on existing easements than to widen or purchase new easements. Existing easements also typically have existing access, which limits the need to construct new access roads and purchase their related easements. To calculate the anticipated costs the alternatives must first be identified, and then analyzed for cost of construction and maintenance based on the factors that influence costs. Alternatives B and C (South Line) are superior from the ROW cost perspective, as sufficient ROW easements are already in place along those routes. Alternative A (North Line) has only a 20- to 30-foot ROW, and would require additional easements to reach the needed 110-foot ROW width. Segments requiring entirely new ROW and access would be the most expensive.

The underground alternatives were analyzed for cost effectiveness and other purpose and need factors. Underground construction is typically used in congested urban areas where ROW is constrained and/or overhead construction conflicts with existing development. Construction costs would be much higher, as shown in **Table 2.4-1**, which summarizes the costs for the west end of the Project. Maintenance activities also are much different for underground transmission lines; Western maintains no underground lines in its 18,000-mile power system, and the agency has no personnel trained in underground line maintenance or the specialized maintenance equipment or replacement parts. Partial public funding to subsidize underground transmission line construction would be complicated by regulations governing acceptance of funds from the public by a Federal agency; specific legislation would likely be required. Lacking public or appropriated funding from Congress, the additional costs forthe underground alternatives would be included in the Loveland Area Projects wholesale power rate and ultimately passed on to Loveland Area Projects retail electrical consumers.

Alternative D and No Action would not be cost effective when comparing the extensive maintenance costs of two wood structure lines relative to a single ROW steel structure double-circuit line (**Table 2.4-1**).

In the west region, Alternative C would be the most cost effective as part of the APA. In the east region, Alternative B would be the most cost effective (**Table 2.4-1**).

<u>Total 80-year Lifecycle Cost</u>

Lifecycle costs are related to cost effectiveness and incorporate all costs over the entire life of the Project (**Table 2.4-1**). As discussed above, cost minimization is an important element of the Project purpose and need. The total costs among alternatives may change after the entire life of the Project is analyzed.

Underground options would require a conductor change-out at 40 years, and another one at the end of 80 years, whereas a conductor on an overhead line would still be in service at the end of 80 years. The conductor change-outs would occur only in the middle of the life-cycle and at the end if the line is kept in service, but would represent considerable maintenance costs during those two periods. While the wood poles proposed in Alternative D would be less expensive than steel poles for initial construction, both lines would need to be rebuilt and maintenance costs would increase after the first few years and would be the highest total costs as the wood pole lines reached 80 years in age. Twice the line miles would result in substantially higher total 80-year lifecycle costs when compared with the aboveground alternatives.

Any alternative using steel pole double-circuits would have better lifecycle costs than underground Variant A2 or C1, or Alternative D and the No Action Alternative (**Table 2.4-1**).

For the APA on the west end of the line, Alternative C would have the lowest total 80-year lifecycle cost. On the east end of the line, Alternative B would have the lowest total 80-year lifecycle cost (**Table 2.4-1**).

2.8.2.2 Environmental Factors

ROW Acquisition

For all resources, the least amount of new ROW acquisition would be most desirable. The adverse impact of securing new ROW would be considered higher than the beneficial effects of decommissioning existing ROW. The least ROW impacts on private lands also would be the most desirable environmental outcome. Minimal ROW acquisition would result in the least encumbrance on landowners; the least new environmental disturbance; the least change from the status quo; and the lowest Project cost for ROW. Decommissioning the greatest number of ROWs crossing private lands also would be preferable.

Alternative A would require additional ROW for its entire length as the existing ROW is only 20 to 30 feet, with portions that are 75 feet on the west end. Alternatives B and C would maximize the use of existing adequate ROW and require the least new ROW. All alternatives other than D and the No Action would result in the abandonment of the existing ROW for one entire line, and thus would be preferable.

In the west region, Alternative B would require the least amount of new ROW on private lands. Alternative A1 would decommission 43 more acres of ROW than Alternative B, but would require the acquisition of 36 more acres of new ROW (**Table 2.9-3**).

In the east region, Alternative B would require the least amount of new ROW on private lands, less than half of Alternatives C, D, or No Action, and about a fifth of Alternative A. Although Alternatives A and C would decommission over twice as many acres (61 and 52) of land as Alternative B (25 acres), they also would require more (53 and 25 acres) new ROW outside National Forest System lands than Alternative B (11 acres) (**Table 2.9-2**).

Effects on Visual Resources

The primary reason to consider underground transmission Variants A2 and C1 on the west end of the Project was to reduce visual impacts. Comparison of expected impacts to visual resources from overhead lines yielded mixed results. The proposed steel double-circuit structures would be 30 feet taller on average than the existing wood pole structures and would be more visible over forest screening. There would be fewer structures though, because the steel structures allow for longer spans and fewer structures per mile when compared with wood pole structures. Approximately 15 feet shorter steel structures could be used to decrease the vertical visual impact in residential areas, with the tradeoff of more structures per mile to retain required mid-span conductor clearances. Given the highly personal and local nature of perceived visual impacts, it is not clear which option would be considered advantageous. However, a combination of structure heights, including shorter structures, would likely be placed in the same locations as the existing ones. Offsetting the increased impact of the double-circuit structures is the fact that one entire ROW would be vacated and allowed to return to natural vegetation, yielding a substantial visual benefit to the Project area.

Because of pole length and strength limitations, double-circuit wood pole structures would not be utilized. The only viable wood pole alternative would be to rebuild both lines as single-circuit lines (Alternative D).

This option would be more expensive and more visually impacting than a single steel pole double-circuit alternative because both existing lines would have to be rebuilt and no ROW would be abandoned.

Western believes that any double-circuit alternative that results in the abandonment of one ROW to be overall superior to the existing visual situation on either end of the line. Alternative D would essentially be no change except for additional clearing around the lines to comply with NERC standards, especially on the North Line where additional ROW would be needed. Alternative D would, therefore, likely have more visual impact than the existing situation, but compliance with NERC clearance requirements would mean No Action would have similar visual effects.

While underground construction would eliminate the need for transmission line structures and conductors, Alternatives A2 and C1 would still result in substantial visual impacts. Access vaults would be required every 900 to 3,500 feet and a pair of large steel monopole three-phase transition structures would be needed at either end of the underground section. ROWs for underground lines need to be completely cleared of woody vegetation for a minimum width of 50 feet, as compared to overhead lines that allow lower-growing shrubs and small trees in the ROW, and no clearing at all in ravines that would be spanned. At a distance, structures tend to blend in and the cleared ROW becomes the dominant visual impact, as demonstrated in the visual simulations in **Appendix C**. With overhead transmission lines, woody vegetation in the ROW breaks up the clearing somewhat and blends colors with the surrounding vegetation. In comparison, the completely cleared ROW for the underground variants would result in a different dominant color and be more visible from many angles than an overhead line ROW. It is acknowledged that at any given location and orientation to Alternatives A2 and C1, it could be demonstrated that one option or the other would be better at that specific location. Western has to consider the bigger picture, including considering visual impacts in conjunction with other resource impacts and the purpose and need for the Project. Western concludes that for this Project, from an overall standpoint, underground construction does not necessarily offer a clear advantage to overhead lines, and an underground option was not selected as part of the APA.

Although Alternative A2 in the west region would have the least visual impact in terms of proximity to the fewest residences and roads, and the most non-forest vegetation clearing, Western believes that given overall considerations, Alternative C would offer the best visual advantages in the west region. Under Alternative C, the ROW would be approximately 0.1 mile downslope of U.S. Highway 36. Most of the ROW would be screened by trees and the highway embankment as U.S. Highway 36 enters Estes Park; additionally, existing structures immediately adjacent to U.S. Highway 36 would be removed, a substantial improvement in visual impacts compared with existing conditions.

In the east region, Alternative B on the whole would be expected to have the least visual impact. Alternative B would be further away from residences near the Newell Lake View Subdivision and also is the alternative that contains the least amount of roads within 0.5 mile, resulting in less visual impacts to road viewers in the Project area. Alternative B also would result in a relatively low amount of forest clearing, further lessening visual impacts.

Forest Road Construction/Reconstruction

Western's decision not to upgrade the four-wheel drive section of Pole Hill Road would leave access and forest recreation use unchanged for the APA. This decision alleviated many concerns that the Forest Service had about increased public access and related potential resource effects. Existing access to structures is poor overall, and would need to be upgraded for any alternative. New or improved access roads to structures would be needed on the forest, but generally only to one ROW (except for Alternatives D and No Action). For most alternatives, access to fewer structures would be needed. The Forest Service would prefer the least amount of road construction/reconstruction on the forest. The Forest Service Special Use Permit would likely address road gating or other means to address unauthorized use.

In the west region, Alternatives B, C, and C1 would have the least miles of new administrative roads on Forest Service lands for permanent access (**Table 2.9-2**).

In the east region, all alternatives except D and the No Action would have no new Forest Service roads needed for permanent access (**Table 2.9-3**).

Recreational Uses and Experiences

By being permanently closed off to discourage unauthorized use, all abandoned ROW or access roads to it would gradually revert to natural conditions and signs of human presence would diminish. Leaving the four-wheel drive section of Pole Hill Road unimproved in the APA would leave that barrier to public access unchanged, so no increase in public access and related recreational use would occur as a result. This may be viewed as positive by the Forest Service and four-wheel drive operators, but negatively by the general public wanting increased access to public lands. In identifying the APA, it was noted that all alternatives would require development of new access roads to reach structures for maintenance. Access roads can be used by recreational users, which may be detrimental from the land manager perspective due to potential increased use, increased erosion, introduction of weedy species, etc. Gates or other means restricting use may be employed to control public or unauthorized use of Project access roads, as desired by the landowner. Alternatives using double-circuit steel monopoles would have taller structures than the existing lines, but they would be located largely on existing ROWs except for areas where changes in location have been proposed to lessen potential impacts. Visual impacts are closely related to recreational user experiences as well, and thus also can influence recreational impacts.

All alternatives on both ends of the line other than D and No Action would result in the removal of one existing transmission line and the abandonment of the ROW, thus improving the naturalness and potential recreational experiences of the area. With respect to APA considerations, Alternative B on both ends of the line would require the least amount of new access road construction, and thus would have the least impact on these factors. Alternative C would have the next fewest acres of new access road construction on either end of the line.

Protected Lands

Protected lands include those lands designated as open space, parks, preserves, conservation areas, etc. When routing new transmission lines, these areas would normally be treated as exclusion areas and avoided if possible. In the case of this Project, the existing lines were in place before the protected lands were designated. When rebuilding existing transmission lines, Western looked for opportunities to reroute lines to avoid protected lands if possible. In the east region, the designated lands are quite extensive, and re-routing the alternatives to avoid them would both substantially increase the length of the lines and displace the impacts of the lines onto private landowners that are not presently affected. Additional line length also translates to additional impacts on environmental resources as well as Project costs, and would require new ROW and access on private lands. In view of these considerations, and recognizing that the existing lines have been in place for many decades and have long been part of the developed landscape, new alternatives moving the existing lines off protected landscapes were not developed.

With respect to considerations for the APA, in the west region, no protected lands would be crossed by any of the alternatives (**Table 2.9-2**). In the east region, Alternatives A and C would cross the least number of protected lands, but the differences between Alternatives A, B, and C are fairly small (**Table 2.9-3**).

Effects on Infrastructure

Impacts on existing developed infrastructure were not a large consideration in selecting an APA because such potential conflicts would be minimal and could be accommodated through careful micro-siting in those areas. For all alternatives, the portion of the existing North Line that passes through the Newell Lake View subdivision would be relocated because of existing conflicts with development, although one pole of each structure would be left in place to retain the fiber optic communications connection to Pinewood Reservoir Dam. In other areas, alternatives are either located away from development, or would be on existing ROW in or near residential developments.

In the west region, the No Action Alternative would limit future expansion of the Upper Big Thompson Sanitation District facility because the existing ROW would be maintained (**Table 2.9-2**).

In the east region, the CBT Pole Hill Penstocks are located approximately 600 feet south of Alternatives A, B, and C and would not be an access barrier. Alternative D and the No Action Alternative would be located on both sides of the penstocks. While the penstocks themselves would not be disturbed by the Project (**Table 2.9-3**), they would be access barriers for Alternative D or the No Action.

Property Values and Economic Effects

Potential effects on property values and other economic considerations are always important issues with property owners. In general, accepted peer-reviewed studies from the realty field have shown a range of property value effects ranging from negligible to moderate in the short term. There have been several alternative routes studied in the EIS. All involve resource trade-offs, and most include the removal of one of the two existing lines, and abandonment of the ROW. This would result in an improvement to the existing visual setting, and the abandonment of ROW would remove encumbrances on the properties crossed. Residential developments in the Project area have been designed around the existing transmission line ROWs; new ROWs impact properties that have not been developed around existing easements. In the end, the rebuilt transmission line has to go somewhere. As detailed in Section 4.13, many of the residences along the alternative routes have property values that would have already taken into account the existing transmission lines. Over a short period of time, any observed decreases in property values tend to fade as people become accustomed to the presence of the new infrastructure.

While landowners may feel their property values would be irreparably harmed by a ROW easement or structures within their viewshed, landowners would be compensated for any additional easements on their property while retaining ownership and use of the ROW within certain restrictions. Safety considerations require that no buildings or structures that would reduce line clearances be constructed on the ROW, and utilities must control vegetation to meet reliability standards and have access to structure sites. However, ROWs would not be fenced and landowners may continue to have use of the ROW except for buildings and other structures that could reduce ground clearance and cause safety issues or block the ROW.

The impacts of a new easement on a landowner that does not have an existing easement would be considered to be higher. Alternatives that maximize the use of existing ROWs are considered to have the least economic impacts. Any influence on property values from the Project would already be factored into the current existing valuation due to the presence of the existing transmission line; the easement is already an encumbrance on the property. Therefore, the replacement of an existing line with a new one should not have a substantial effect on a given property. It is Western's goal to have the least possible effect to individual landowners, subdivisions as a whole, and businesses while still meeting purpose and need objectives. Additionally, Western desires to create the least amount of new ROW (both mileage and acreage) while also decommissioning the greatest amount of ROW as possible.

With respect to APA considerations on the west end of the line, Alternative B would not affect any new landowners with new ROW requirements, but would impact one landowner with expanded ROW. Alternative C would require 22 acres of new ROW impacting two landowners, and expanded ROW on another landowner. Alternative C1 would require 23 acres of new ROW, but would decommission 40 acres. The other alternatives (A, A1, A2, D, and No Action) would impact a larger number of landowners with new ROW, but would have more landowners (18 to 22) with decommissioned ROW. For the APA on the west, Alternatives B and C affect the least number of owners by both new ROW and expanded ROW (**Table 2.9-2**). On the east end of the line, Alternative B would affect the least number of landowners with both new and expanded ROW needs (**Table 2.9-3**).

In addition, ROW decommissioning was taken in to account by Western in selecting the APA. Alternatives that maximize ROW decommissioning are favorable for reducing overall visual impacts and minimizing maintenance activity and disturbance to the area. All alternatives except D and the No Action Alternative decommission ROW.

In the west region, Alternative A1 would decommission lands for the largest number of landowners (**Table 2.9-2**). In the east region, Alternative B would decommission lands for the most landowners (**Table 2.9-3**).

Cultural Resources

Very few cultural sites were located in the area of the Project (**Tables 2.9-1, 2.9-2,** and **2.9-3**). Those sites would be easily avoided by overhead transmission lines, structures, and access roads. Avoidance is Western's preferred means of preventing impact to potentially eligible or eligible cultural resources sites. Because of the few sites and the fact that sites can be avoided regardless of the alternative selected, cultural resources did not play a role in selecting an APA for this Project.

Water Resources, Floodplains, and Wetlands

The terrain crossed by the Project ranges from hilly to mountainous over most of its length. Stream courses are in low areas with relatively narrow floodplains, and can be easily spanned by the transmission line whose structures would be mainly located on higher points where structures can be shorter while still maintaining conductor clearances. Access roads to structure sites can approach structure locations from either side of the stream course, or can utilize existing road crossings or cross at advantageous locations with the least environmental impact. The largest potential floodplain and wet meadow area is found on the west end along Alternatives A and A1. Waterbodies and wetlands are considered 'crossed' if any portion of them extends into the study area for the route, which is 110 feet wide. As described in Section 4.6, it is believed that all wetlands would be avoided or spanned. Additional wetland delineations would be conducted once final design and engineering is completed and the placement of structures and access roads are confirmed (see Section 2.5).

Based on preliminary information, subject to change after final siting of roads and structures, in the west region , Alternatives C and C1 would have the least number of waterbodies crossed while Alternative C1 would have the least number of waters of the U.S. crossed and Alternatives B and C1 would have the least number of wetlands crossed (**Table 2.9-2**). For APA considerations, Alternatives B, C, and C1 have the least numbers of combined water resource features on the west end of the line.

Based on preliminary information, subject to change after final siting of roads and structures, in the east region, Alternative A would cross the least number of waterbodies and Alternative A and would cross the least Waters of the U.S.; Alternative B would cross the least number of wetlands (**Table 2.9-3**). For APA considerations, Alternatives A and B have the fewest numbers of combined water resource features on the east end of the line (**Table 2.9-3**).

Electric and Magnetic Fields

EMF has been a concern of the public since the issue first surfaced in the early 1970s. Despite 40 years of research, no link has been demonstrated between EMF exposure and human health issues. Some studies have indicated a relationship, but none have been replicated and any correlation has been just above the level of statistical significance (the threshold level where the results of a study or analysis cannot be explained as occurring purely by chance). The double-circuit transmission lines would be designed to minimize EMF and would produce electric fields that would be 70 percent less at the edge of a 110-foot-wide ROW (55 feet from the centerline) than the existing lines. Additionally, the new double-circuit line would reduce magnetic field levels to less than the existing H-frame line within the 110-foot ROW. The Colorado Public Utilities Commission states that magnetic fields of less than 150 milligauss (mG) at the edge of the ROW are reasonable; anticipated levels for this Project would be 1.8 to 5.2 at maximum load. As detailed in Section 4.14.3.5, the maximum induced electrical field of any of the proposed alternatives is estimated at 0.5 kilovolt per meter (kV/m), well below the estimated interference threshold of 3.4-kV/m. Therefore, with operation at 115-kV capacity, the Project would not pose a risk to pacemaker wearers.

The No Action Alternative and Alternative D would have the highest EMF values because they would be single-circuit lines with no double-circuit cancellation, and conductors would be in a horizontal configuration. All alternatives using double-circuit steel monopole construction would have the same lower EMF values as they would have the double-circuit cancellation effect and also would have four of the six conductors further from the ground.

In the west region, the underground Alternatives A2 and C1 would have no electric fields, but would have higher magnetic fields as burial does not diminish magnetic fields and the conductors would be closer to persons in or at the edge of the ROW (**Table 2.9-2**).

In the east region, all alternatives, including the No Action, would remove the section of transmission line through the Newell Lake View subdivision due to encroachments and safety concerns. However, one pole of each structure would be left to carry the fiber optic needed for communication with Pinewood Reservoir dam. The fiber optic line would generate no EMF (**Table 2.9-3**).

Effects on Plants, Wildlife, and Fish

The alternatives were not found to have any discrimination among them for listed or sensitive species, so there is no alternative that offers less potential impact than the others. There are some differences in the amount of elk, mule deer, and moose winter range. However, since most of the alternatives remain on existing ROW, any effects would be slight in any case, and largely limited to construction activities during the winter months, if any. A route with the least acreage of overlap with big game winter range would be preferred. No fish habitat would be impacted.

From an environmental resources and ecological viewpoint, there is an argument for choosing an alternative in an already developed area over one that has little or no development. Choosing an alternative that would require construction or reconstruction and long-term maintenance in areas with no other large infrastructure is less desirable than choosing an alternative where there is already human infrastructure in place. The removal of a large industrial facility such as a transmission line from an area with no other infrastructure would allow natural vegetation, animal use, and other ecosystems succession to progress. The placement of a transmission facility in an area that already has human development such as an existing ROW, highways, well-travelled roads, higher human habitation, etc. would in the long term have the least negative effect on the overall natural environment of Project area.

As with several other resources, Alternatives D and the No Action would be the least desirable because they would continue to use both ROWs, and construction and periodic maintenance activities would be required along both ROWs over the life of the Project. Alternatives using existing ROW on the South Line would have the least effect on plants and wildlife since the existing maintained ROW would be used. North Line alternatives would require expansion of ROW to 150 feet, with incremental impacts compared to the existing line. Compared to steel lines, wood pole lines would require relatively more maintenance, especially as they age. The total clearing of all woody vegetation for a minimum of 50 feet over the underground Alternatives A2 and C1 would create a more pronounced edge effect to wildlife, and increase the potential for habitat fragmentation effects.

With respect to the APA on the west end, Alternatives A and C differ by about an acre of big game range (**Table 2.9-2**). Alternative A would cross the least amount of big game habitat; however, Alternatives B and C have fairly similar extents (20 to 23 acres is the range) (**Table 2.9-3**). Similarly, on the east end, Alternative B would cross the least amount of big game habitat (**Table 2.9-3**).

No alternatives would be likely to adversely affect listed species. There would be only slight differences in potential impacts to special status or Forest Service management indicator species among alternatives.

2.9 Comparison of Effects from Alternatives

Tables 2.9-1, **2.9-2**, and **2.9-3** compare the alternatives and APA using measurable indicators with regard to Key Issues and other issues identified in Section 1.6.3. **Table 2.9-1** compares the alternatives over their full lengths. Based on public input, additional summary impact tables were produced (**Tables 2.9-2** and **2.9-3**) which compare the impacts at both ends of the Project (west region and east region, see **Figure 2.2-8**). **Table 2.9-4** provides a summary comparison of environmental effects by resource and alternative. Data presented in these tables were based on additional information regarding the specific effects of each alternative to each resource and can be found in Chapter 4.0. Data presented in **Tables 2.9-1** through **2.9-3** have been modified slightly compared to what was presented in the Draft EIS to take advantage of new data availability and revised ROW acquisition needs, as well as to include the APA.

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Table 2.9-1 Measurement Indicators for Key and Other Issues, Full-Length Alternatives

Measurement Indicators for Issues	Alternative A	Variant A1	Variant A2	Alternative B	Alternative C	Variant C1	Alternative D	Agency-Preferred Alternative (APA)	No Action Alternative
Issue: ROW acquisition									
Acres of new ROW acquisition [1]	140	144	137	42	101	102	120	87	120
Acres of new ROW acquisition (National Forest System lands) [1]	14	14	14	10	10	10	14	10	14
Acres of ROW to be decommissioned [1]	154	159	158	57	132	131	2	105	2
Linear miles of ROW to be decommissioned[1]	15	16	16	14	16	16	1	15	1
Miles of land ownership crossed	Private - 12.5 USFS - 1.5 DOI - 0.1 SLB - 0.0 NCWCD - 0.4 County - 0.6	Private - 12.7 USFS - 1.5 DOI - 0.1 SLB - 0.0 NCWCD - 0.4 County - 0.5	Private - 12.8 USFS - 1.5 DOI - 0.1 SLB - 0.0 NCWCD - 0.4 County - 0.5	Private - 9.9 USFS - 2.0 DOI - 0.1 SLB - 1.0 NCWCD - 0.8 County - 1.0	Private - 11.2 USFS - 2.0 DOI - 0.1 SLB - 0.0 NCWCD - 1.1 County - 1.1	Private - 11.3 USFS - 2.0 DOI - 0.1 SLB - 0.0 NCWCD - 1.1 County - 1.1	Private - 20.8 USFS - 3.4 DOI - 0.2 SLB - 1.0 NCWCD - 1.5 County - 1.7	Private - 10.0 USFS – 2.0 DOI – 0.1 SLB – 1.0 NCWCD - 0.8 County – 1.0	Private - 20.8 USFS - 3.4 DOI - 0.2 SLB - 1.0 NCWCD - 1.5 County - 1.7
Issue: effects on visual resources									
Existing Scenic Integrity Objective (SIO) (National Forest System lands)	Moderate	Moderate	Moderate	Moderate	Moderate	Moderate	Moderate	Moderate	Moderate
Resulting SIO (National Forest System lands)	Very Low[2]	Very Low[2]	Very Low[2]	Very Low[2]	Very Low[2]	Very Low[2]	Moderate	Very Low[2]	Moderate
Issue: Forest road construction/reconstruction [3]									
Miles of new administrative road on National Forest System land for permanent access	0.9	0.9	0.9	0.6	0.6	0.6	2.0	0.6	2.0
Reconstruction of existing ML2 system road on National Forest System lands (miles)	0	0	0	0	0	0	0	0	0
Limited reconditioning of existing ML2 system road post-construction (miles)	2.5	2.5	2.5	3.4	3.8	3.8	3.4	3.8	3.4
Issue: recreational uses and experiences									
Long-term changes in recreation opportunities on National Forest System lands	No Changes due to Project[4]	No Changes due to Project[4]	No Changes due to Project[4]	No Changes due to Project[4]	Significant adverse impacts to four-wheel drive opportunities due to west Pole Hill Road upgrade; increased opportunities for dispersed recreation.	Significant adverse impacts to four-wheel opportunities due to west Pole Hill Road upgrade; increased opportunities for dispersed recreation.	No Changes due to Project[4]	No Changes due to Project[4]	No Changes due to Project[4]
Issue: protected lands									
No. protected lands crossed [5]	4	4	4	5	4	4	6	5	6
Issue: effects on infrastructure									
Conflicts with Upper Thompson Sanitation District	No	No	No	No	No	No	No	No	Limits facility expansion
CB Pole Hill Penstocks[8]	No	No	No	No	No	No	No	No	No
Issue: property values and economic effects									
No. of landowners affected by ROW acquisition [1]	59	49	60	23	51	74	61	24	61
New ROW	17	12	23	3	14	37	13	4	13
Expanded ROW	42	37	37	20	37	37	48	20	48

Table 2.9-1 Measurement Indicators for Key and Other Issues, Full-Length Alternatives

Measurement Indicators for Issues	Alternative A	Variant A1	Variant A2	Alternative B	Alternative C	Variant C1	Alternative D	Agency-Preferred Alternative (APA)	No Action Alternative
No. of landowners affected by both new ROW and expanded ROW acquisition [1]	53	46	56	21	47	69	55	23	55
Subdivisions affected by ROW acquisition (new or expanded ROW)	Park Hill Newell Lake	Park Hill Newell Lake	Park Hill Newell Lake	Park Hill	Park Hill Newell Lake	Park Hill Newell Lake	Park Hill Newell Lake	Park Hill	Park Hill Newell Lake
No. of landowners with ROW to be decommissioned	58	61	60	61	50	48	17	62	17
Businesses directly affected	NA	NA	NA	NA	Four-wheel drive tour operator	Four-wheel drive tour operator	NA	NA	NA
Issue: cultural resources									
Number of NRHP-eligible historic sites potentially impacted	4	5	4	3	5	4	5	5	5
Issue: water resources, floodplains, and wetlands [6]									
Waterbodies Crossed	44	41	41	34	42	42	67	38	66
Wetlands Present	15	14	15	9	14	13	21	12	20
Waters of the U.S.	20	18	20	14	22	20	29	20	29
Issue: ROW clearing and maintenance									
Soil types in Analysis Area [7]									
Soils with shallow bedrock (within 60 inches of soil surface) (acres)	279	326	266	316	320	271	521	285	515
Low revegetation potential (acres)	32	97	37	101	68	26	144	68	144
Compaction prone (acres)	123	123	122	71	173	161	207	120	200
Water erodible (acres)	164	172	160	114	114	111	215	94	217
Vegetation types in ROW [8]									
Ponderosa pine woodland (acres)	136	145	139	103	128	124	210	118	210
Mixed conifer forest (acres)	9	13	9	34	17	17	42	17	42
Mountain shrub mosaic (acres)	29	25	28	28	34	35	63	31	63
Upland meadow, or upland meadow/wetland mosaic (acres)	16	10	15	17	16	20	39	17	39
Issue: electric and magnetic fields									
Electric fields at ROW edge (kilovolt per meter [kV/m]) [9]	0.12	0.12	0	0.12	0.12	0	0.34	0.12	0.34
Magnetic fields at each ROW edge (milligauss [mG]) [10]	5.2/1.8	5.2/1.8	0.05	5.2/1.8	5.2/1.8	0.05	5.2/5.3	5.2/1.8	5.2/5.3
Issue: effects on plants, wildlife, and fish									
Special Status Plants [11]									
Threatened and endangered	NLAA	NLAA	NLAA	NLAA	NLAA	NLAA	NLAA	NLAA	NLAA
Sensitive species	MAII	MAII	MAII	MAII	MAII	MAII	MAII	MAII	MAII
Species of local concern	LP	LP	LP	LP	LP	LP	LP	LP	LP
Big Game [12]									
Elk and Mule Deer Winter Range (acres)	83	84	97	84	82	103	122	81	122
Moose Winter Range (acres)	35	36	39	38	36	42	56	36	56

Table 2.9-1 Measurement Indicators for Key and Other Issues, Full-Length Alternatives

Measurement Indicators for Issues	Alternative A	Variant A1	Variant A2	Alternative B	Alternative C	Variant C1	Alternative D	Agency-Preferred Alternative (APA)	No Action Alternative
Special Status Wildlife [13]									
Threatened and endangered	NLAA	NLAA	NLAA	NLAA	NLAA	NLAA	NLAA	NLAA	NLAA
Sensitive species	MAII	MAII	MAII	MAII	MAII	MAII	MAII	MAII	MAII
Management indicator species	NC	NC	NC	NC	NC	NC	NC	NC	NC

[1] The transmission line ROW acquisition footprint was revised based on a June 11, 2015 call between Carey Ashton (Western) and Steve Ensley (AECOM). Transmission ROW acreage does not include access roads.
[2] Would require lowering of SIO and documentation of change of SIO in MA 8.3 - Utility Corridor for this Project area, in accordance with Forest Plan Standard 154 and also documentation in the USFS ROD.
[3] All construction and reconstruction analyses were calculated with Western provided shapefiles. Forest road construction and reconstruction analysis does not include transmission line ROW acreage.
[4] The Project would not change existing public road systems, access to recreational opportunities, or the four-wheel drive section of West Pole Hill Road. Therefore, the Project would have no effect on recreational uses and experiences.
[5] Protected lands include the Flatiron Reservoir County Park, Chimney Hollow Open Space, Pinewood Reservoir County Park, Ramsay Shockey Open Space, Blue Mountain Bison Ranch, and a SLB Stewardship Trust parcel.
[6] Wetlands and waterbodies were determined from desktop analysis (USGS NHD data) and augmented with survey data where available. Ground surveys were completed early in the NEPA process during initial EA alternative development. Therefore, survey data were not collected for the full suite of alternatives. A full delineation of wetlands and waterbodies will be performed on the APA during final design and prior to construction. “Waterbodies” encompasses both perennial and intermittent streams.
[7] The soils analysis was based on a corridor of 200 feet for existing transmission lines centered on the ROW, 300 feet for new routing options, and 75 feet for underground variants. Some locations may have more than one soil characteristic.
[8] Data were determined based on a 110-foot width centered on the anticipated line and 75 feet for underground variants. Data also are based on ESRI landcover data/Southwest Regional Gap Analysis Project (SWReGAP).
[9] New steel pole line has a lower electric field signature than the existing H-frame line because of taller structures and the cancelation effect of the double-circuit line.
[10] Magnetic fields of new steel pole line would be similar at the edge of the ROW compared to the existing H-frame line, but less when within the ROW. Additionally, magnetic fields differ on either side of the aboveground structures.
[11] Determinations based on analyses identified in Section 4.8.
[12] Acreage is based on the overlap of elk and mule deer winter range over the estimated construction surface disturbance within the ROW.
[13] Determinations based on analyses identified in Section 4.10.

Abbreviations:
NA = not applicable or effects would not occur.
LP = low probability of species presence.
MAII = may adversely impact individuals, but not likely to result in a loss of viability on the Planning area, or cause a trend to federal listing.
NLAA = may affect, not likely to adversely affect.
NC = no change in population trend.

Table 2.9-2 Measurement Indicators for Key and Other Issues, West Region Portions of Alternatives

Measurement Indicators for Issues	West Region, Alternative A	Variant A1	Variant A2	West Region Alternative B	West Region Alternative C	Variant C1	West Region Alternative D	West Region Only, Agency-Preferred Alternative (APA)	West Region No Action Alternative
Issue: ROW acquisition									
Acres of new ROW acquisition [1]	36	40	33	4	26	27	35	26	35
Acres of new ROW acquisition (National Forest System lands) [1]	8	8	8	4	4	4	8	4	8
Acres of ROW to be decommissioned [1]	51	57	56	14	40	39	1	40	1
Linear miles of ROW to be decommissioned[1]	4	6	6	4	5	5	0	5	0
Miles of land ownership crossed	Private - 2.7 USFS - 0.9 DOI - 0.0 SLB - 0.0 NCWCD - 0.0 County - 0.1	Private - 2.9 USFS - 0.9 DOI - 0.0 SLB - 0.0 NCWCD - 0.0 County - 0.0	Private - 3.0 USFS - 0.9 DOI - 0.0 SLB - 0.0 NCWCD - 0.0 County - 0.0	Private - 2.6 USFS - 1.4 DOI - 0.0 SLB - 0.0 NCWCD - 0.0 County - 0.0	Private - 2.6 USFS 1.4 DOI - 0.0 SLB - 0.0 NCWCD - 0.0 County - 0.0	Private - 2.7 USFS - 1.4 DOI - 0.0 SLB - 0.0 NCWCD - 0.0 County - 0.0	Private - 5.3 USFS - 2.3 DOI - 0.0 SLB - 0.0 NCWCD - 0.0 County - 0.1	Private - 2.6 USFS - 1.4 DOI - 0.0 SLB - 0.0 NCWCD – 0.0 County - 0.0	Private - 5.3 USFS - 2.3 DOI - 0.0 SLB - 0.0 NCWCD - 0.0 County - 0.1
Issue: effects on visual resources									
Existing SIO (National Forest System lands)	Moderate	Moderate	Moderate	Moderate	Moderate	Moderate	Moderate	Moderate	Moderate
Resulting SIO (National Forest System lands)	Very Low[2]	Very Low[2]	Very Low[2]	Very Low[2]	Very Low[2]	Very Low[2]	Moderate	Very Low[2]	Moderate
Issue: Forest road construction/reconstruction [3]									
Miles of new administrative road on National Forest System land for permanent access	0.8	0.8	0.8	0.5	0.5	0.5	1.4	0.5	1.4
Reconstruction of existing ML2 system road on National Forest System lands (miles)	0	0	0	0	0	0	0	0.0	0
Limited reconditioning of existing ML2 system road post-construction (miles)	0.7	0.7	0.7	1.6	2	2	1.6	2	1.6
Issue: recreational uses and experiences									
Long-term changes in recreation opportunities on National Forest System lands	No Changes due to Project[4]	No Changes due to Project[4]	No Changes due to Project[4]	No Changes due to Project[4]	Changes to four-wheel drive opportunities	Changes to four-wheel drive opportunities	No Changes due to Project[4]	No Changes due to Project[4]	No Changes due to Project[4]
Issue: protected lands									
No. protected lands crossed [5]	0	0	0	0	0	0	0	0	0
Issue: effects on infrastructure									
Conflicts with Upper Thompson Sanitation District	No	No	No	No	No	No	No	No	Limits facility expansion
CB Pole Hill Penstocks[8]	No	No	No	No	No	No	No	No	No
Issue: property values and economic effects									
No. of landowners affected by ROW acquisition [1]	16	6	17	1	3	26	12	3	12
New ROW	9	4	15	0	2	25	3	2	3
Expanded ROW	7	2	2	1	1	1	9	1	9
No. of landowners affected by both new ROW and expanded ROW acquisition [1]	12	5	15	1	3	25	9	3	9
Subdivisions affected by ROW acquisition (new or expanded ROW)	Park Hill	Park Hill	Park Hill	Park Hill	Park Hill	Park Hill	Park Hill	Park Hill	Park Hill
No. of landowners with ROW to be decommissioned	18	22	20	9	10	8	3	10	3

Table 2.9-2 Measurement Indicators for Key and Other Issues, West Region Portions of Alternatives

Measurement Indicators for Issues	West Region, Alternative A	Variant A1	Variant A2	West Region Alternative B	West Region Alternative C	Variant C1	West Region Alternative D	West Region Only, Agency-Preferred Alternative (APA)	West Region No Action Alternative
Businesses directly affected	NA	NA	NA	NA	NA: Four-wheel drive tour operator would not be affected, due to a Project Design Change	NA: Four-wheel drive tour operator would not be affected, due to a Project Design Change	NA	NA	NA
Issue: cultural resources									
Number of NRHP-eligible historic sites potentially impacted	0	1	0	0	1	0	0	1	0
Issue: water resources, floodplains, and wetlands [6]									
Waterbodies Crossed	13	10	10	5	4	4	16	4	16
Wetlands Present	4	3	4	2	3	2	7	3	7
Waters of the U.S.	5	3	4	3	3	1	8	3	8
Issue: ROW clearing and maintenance									
Soil types in Analysis Area [7]									
Soils with shallow bedrock (within 60 inches of soil surface) (acres)	51	98	38	96	97	48	147	97	147
Low revegetation potential (acres)	27	92	32	63	63	21	89	63	89
Compaction prone (acres)	6	6	5	1	19	7	6	19	6
Water erodible (acres)	19	27	15	17	12	9	36	12	36
Vegetation types in ROW [8]									
Ponderosa pine woodland (acres)	29	38	32	31	34	30	61	34	61
Mixed conifer forest (acres)	4	8	4	20	14	14	24	14	24
Mountain shrub mosaic (acres)	7	3	6	1	3	4	8	3	8
Upland meadow, or upland meadow/wetland mosaic (acres)	7	1	6	1	1	5	6	1	6
Issue: electric and magnetic fields									
Electric fields at ROW edge (kilovolt per meter [kV/m]) [9]	0.12	0.12	0	0.12	0.12	0	0.34	0.12	0.34
Magnetic fields at each ROW edge (milligauss [mG]) [10]	5.2/1.8	5.2/1.8	0.05	5.2/1.8	5.2/1.8	0.05	5.2/5.3	5.2/1.8	5.2/5.3
Issue: effects on plants, wildlife, and fish									
Special Status Plants [11]									
Threatened and endangered	NLAA	NLAA	NLAA	NLAA	NLAA	NLAA	NLAA	NLAA	NLAA
Sensitive species	MAII	MAII	MAII	MAII	MAII	MAII	MAII	MAII	MAII
Species of local concern	LP	LP	LP	LP	LP	LP	LP	LP	LP
Big Game [12]									
Elk and Mule Deer Winter Range (acres)	20	21	21	23	21	23	33	21	33
Moose Winter Range (acres)	20	21	21	23	21	23	33	21	33

Table 2.9-2 Measurement Indicators for Key and Other Issues, West Region Portions of Alternatives

Measurement Indicators for Issues	West Region, Alternative A	Variant A1	Variant A2	West Region Alternative B	West Region Alternative C	Variant C1	West Region Alternative D	West Region Only, Agency-Preferred Alternative (APA)	West Region No Action Alternative
Special Status Wildlife [13]									
Threatened and endangered	NLAA	NLAA	NLAA	NLAA	NLAA	NLAA	NLAA	NLAA	NLAA
Sensitive species	MAII	MAII	MAII	MAII	MAII	MAII	MAII	MAII	MAII
Management indicator species	NC	NC	NC	NC	NC	NC	NC	NC	NC

[1] The transmission line ROW acquisition footprint was revised based on a June 11, 2015 call between Carey Ashton (Western) and Steve Ensley (AECOM). Transmission ROW acreage does not include access roads.

[2] Would require lowering of SIO and documentation of change of SIO in MA 8.3 - Utility Corridor for this Project area, in accordance with Forest Plan Standard 154 and also documentation in the USFS ROD.

[3] All construction and reconstruction analyses were calculated with Western provided shapefiles. Forest road construction and reconstruction analysis does not include transmission line ROW acreage.

[4] The Project would not change existing public road systems, access to recreational opportunities, or the four-wheel drive section of West Pole Hill Road. Therefore, the Project would have no effect on recreational uses and experiences.

[5] Protected lands include the Flatiron Reservoir County Park, Chimney Hollow Open Space, Pinewood Reservoir County Park, Ramsay Shockey Open Space, Blue Mountain Bison Ranch, and a SLB Stewardship Trust parcel.

[6] Wetlands and waterbodies were determined from desktop analysis (USGS NHD data) and augmented with survey data where available. Ground surveys were completed early in the NEPA process during initial EA alternative development. Therefore, survey data were not collected for the full suite of alternatives. A full delineation of wetlands and waterbodies will be performed on the APA during final design and prior to construction. “Waterbodies” encompasses both perennial and intermittent streams.

[7] The soils analysis was based on a corridor of 200 feet for existing transmission lines centered on the ROW, 300 feet for new routing options, and 75 feet for underground variants. Some locations may have more than one soil characteristic.

[8] Data were determined based on a 110-foot width centered on the anticipated line and 75 feet for underground variants. Data also are based on ESRI landcover data/SWReGAP.

[9] New steel pole line has a lower electric field signature than the existing H-frame line because of taller structures and the cancelation effect of the double-circuit line.

[10] Magnetic fields of new steel pole line would be similar at the edge of the ROW compared to the existing H-frame line, but less when within the ROW. Additionally, magnetic fields differ on either side of the aboveground structures.

[11] Determinations based on analyses identified in Section 4.8.

[12] Acreage is based on the overlap of elk and mule deer winter range over the estimated construction surface disturbance within the ROW.

[13] Determinations based on analyses identified in Section 4.10.

Abbreviations:

NA = not applicable or effects would not occur.

LP = low probability of species presence.

MAII = may adversely impact individuals, but not likely to result in a loss of viability on the Planning area, or cause a trend to federal listing.

NLAA = may affect, not likely to adversely affect.

NC = no change in population trend.

Table 2.9-3 Measurement Indicators for Key and Other Issues, East Region Portions of Alternatives

Measurement Indicators for Issues	East Region, Alternative A	East Region, Alternative B	East Region, Alternative C	East Region, Alternative D	East Region, Agency-Preferred Alternative (APA)	East Region, No Action Alternative
Issue: ROW acquisition						
Acres of new ROW acquisition [1]	59	17	31	40	17	40
Acres of new ROW acquisition (National Forest System lands) [1]	6	6	6	6	6	6
Acres of ROW to be decommissioned [1]	61	25	52	1	25	1
Linear miles of ROW to be decommissioned[1]	6	5	6	0	5	0
Miles of land ownership crossed	Private - 5.1 USFS - 0.6 DOI - 0.1 SLB - 0.0 NCWCD - 0.4 County - 0.5	Private - 2.7 USFS - 0.6 DOI - 0.1 SLB - 1.0 NCWCD - 0.8 County - 1.0	Private - 3.9 USFS - 0.6 DOI - 0.1 SLB - 0.0 NCWCD - 1.1 County - 1.1	Private - 6.2 USFS - 1.1 DOI - 0.2 SLB - 1.0 NCWCD - 1.5 County - 1.6	Private - 2.7 USFS - 0.6 DOI - 0.1 SLB - 1.0 NCWCD - 0.8 County - 1.0	Private - 6.2 USFS - 1.1 DOI - 0.2 SLB - 1.0 NCWCD - 1.5 County - 1.6
Issue: effects on visual resources						
Existing SIO (National Forest System lands)	Moderate	Moderate	Moderate	Moderate	Moderate	Moderate
Resulting SIO (National Forest System lands)	Very Low[2]	Very Low[2]	Very Low[2]	Moderate	Very Low[2]	Moderate
Issue: Forest road construction/reconstruction [3]						
Miles of new administrative road on National Forest System land for permanent access	0.0	0.0	0.0	0.5	0.0	0.5
Reconstruction of existing ML2 system road on National Forest System lands (miles)	0	0	0	0	0	0
Limited reconditioning of existing ML2 system road post-construction (miles)	1.4	1.4	1.4	1.4	1.4	1.4
Issue: recreational uses and experiences						
Long-term changes in recreation opportunities on National Forest System lands	No Changes due to Project[4]	No Changes due to Project[4]	No Changes due to Project[4]	No Changes due to Project[4]	No Changes due to Project[4]	No Changes due to Project[4]
Issue: protected lands						
No. protected lands crossed [5]	4	5	4	6	5	6
Issue: effects on infrastructure						
Conflicts with Upper Thompson Sanitation District	No	No	No	No	No	No
CB Pole Hill Penstocks[8]	No	No	No	No	No	No
Issue: property values and economic effects						
No. of landowners affected by ROW acquisition [1]	28	6	33	34	6	34
New ROW	8	2	12	10	2	10
Expanded ROW	20	4	21	24	4	24
No. of landowners affected by both new ROW and expanded ROW acquisition [1]	26	5	29	31	5	31
Subdivisions affected by ROW acquisition (new or expanded ROW)	Newell Lake	NA	Newell Lake	Newell Lake	NA	Newell Lake
No. of landowners with ROW to be decommissioned	26	38	26	14	38	14
Businesses directly affected	NA	NA	NA	NA	NA	NA

Table 2.9-3 Measurement Indicators for Key and Other Issues, East Region Portions of Alternatives

Measurement Indicators for Issues	East Region, Alternative A	East Region, Alternative B	East Region, Alternative C	East Region, Alternative D	East Region, Agency-Preferred Alternative (APA)	East Region, No Action Alternative
Issue: cultural resources						
Number of NRHP-eligible historic sites potentially impacted	3	3	3	4	3	4
Issue: water resources, floodplains, and wetlands [6]						
Waterbodies Crossed	13	16	20	27	16	26
Wetlands Present	5	3	5	7	3	6
Waters of the U.S.	5	7	9	11	7	11
Issue: ROW clearing and maintenance						
Soil types in Analysis Area [7]						
Soils with shallow bedrock (within 60 inches of soil surface) (acres)	176	136	171	255	136	249
Low revegetation potential (acres)	1	1	1	14	1	14
Compaction prone (acres)	62	46	99	126	46	119
Water erodible (acres)	134	71	91	141	71	143
Vegetation types in ROW [8]						
Ponderosa pine woodland (acres)	58	36	46	67	36	67
Mixed conifer forest (acres)	3	0	0	1	0	1
Mountain shrub mosaic (acres)	18	23	26	47	23	47
Upland meadow, or upland meadow/wetland mosaic (acres)	9	16	15	33	16	33
Issue: electric and magnetic fields						
Electric fields at ROW edge (kilovolt per meter [kV/m]) [9]	0.12	0.12	0.12	0.34	0.12	0.34
Magnetic fields at each ROW edge (milligauss [mG]) [10]	5.2/1.8	5.2/1.8	5.2/1.8	5.2/5.3	5.2/1.8	5.2/5.3
Issue: effects on plants, wildlife, and fish						
Special Status Plants [11]						
Threatened and endangered	NLAA	NLAA	NLAA	NLAA	NLAA	NLAA
Sensitive species	MAII	MAII	MAII	MAII	MAII	MAII
Species of local concern	LP	LP	LP	LP	LP	LP
Big Game [12]						
Elk and Mule Deer Winter Range (acres)	37	35	36	50	35	50
Moose Winter Range (acres)	0	0	0	0	0	0

Table 2.9-3 Measurement Indicators for Key and Other Issues, East Region Portions of Alternatives

Measurement Indicators for Issues	East Region, Alternative A	East Region, Alternative B	East Region, Alternative C	East Region, Alternative D	East Region, Agency-Preferred Alternative (APA)	East Region, No Action Alternative
Special Status Wildlife [13]						
Threatened and endangered	NLAA	NLAA	NLAA	NLAA	NLAA	NLAA
Sensitive species	MAII	MAII	MAII	MAII	MAII	MAII
Management indicator species	NC	NC	NC	NC	NC	NC

[1] The transmission line ROW acquisition footprint was revised based on a June 11, 2015 call between Carey Ashton (Western) and Steve Ensley (AECOM). Transmission ROW acreage does not include access roads.

[2] Would require lowering of SIO and documentation of change of SIO in MA 8.3 - Utility Corridor for this Project area, in accordance with Forest Plan Standard 154 and also documentation in the USFS ROD.

[3] All construction and reconstruction analyses were calculated with Western provided shapefiles. Forest road construction and reconstruction analysis does not include transmission line ROW acreage.

[4] The Project would not change existing public road systems, access to recreational opportunities, or the four-wheel drive section of West Pole Hill Road. Therefore, the Project would have no effect on recreational uses and experiences.

[5] Protected lands include the Flatiron Reservoir County Park, Chimney Hollow Open Space, Pinewood Reservoir County Park, Ramsay Shockey Open Space, Blue Mountain Bison Ranch, and a SLB Stewardship Trust parcel.

[6] Wetlands and waterbodies were determined from desktop analysis (USGS NHD data) and augmented with survey data where available. Ground surveys were completed early in the NEPA process during initial EA alternative development. Therefore, survey data were not collected for the full suite of alternatives. A full delineation of wetlands and waterbodies will be performed on APA during design and prior to construction. “Waterbodies” encompasses both perennial and intermittent streams.

[7] The soils analysis was based on a corridor of 200 feet for existing transmission lines centered on the ROW, 300 feet for new routing options, and 75 feet for underground variants. Some locations may have more than one soil characteristic.

[8] Data were determined based on a 110-foot width centered on the anticipated line and 75 feet for underground variants. Data also are based on ESRI landcover data/SWReGAP.

[9] New steel pole line has a lower electric field signature than the existing H-frame line because of taller structures and the cancelation effect of the double-circuit line.

[10] Magnetic fields of new steel pole line would be similar at the edge of the ROW compared to the existing H-frame line, but less when within the ROW. Additionally, magnetic fields differ on either side of the aboveground structures.

[11] Determinations based on analyses identified in Section 4.8.

[12] Acreage is based on the overlap of elk and mule deer winter range over the estimated construction surface disturbance within the ROW.

[13] Determinations based on analyses identified in Section 4.10.

Abbreviations:

NA = not applicable or effects would not occur.

LP = low probability of species presence.

MAII = may adversely impact individuals, but not likely to result in a loss of viability on the Planning area, or cause a trend to federal listing.

NLAA = may affect, not likely to adversely affect.

NC = no change in population trend.

Table 2.9-4 Comparison of Alternative Effects [1]

Resource	Alternative A	Alternative A1	Alternative A2	Alternative B	Alternative C	Alternative C1	Alternative D	Agency-Preferred Alternative (APA)	No Action Alternative
Soils	Potential impacts to soils include compaction and traffic ruts, erosion, and contamination. Compaction and erosion impacts would be minimized through SCPs. Soil contamination would be avoided or mitigated through adherence to SCPs and applicable permit requirements.	Potential impacts would be the same as Alternative A. Acres of impacted soil types would be the same as Alternative A.	The nature of potential impacts would be the same as Alternative A. Fewer acres would be affected than Alternative A. More soil disturbance would result from trenching, possibly reducing soil productivity.	Potential impact factors would be the same as Alternative A. Acres of impacted soil types would be the same as Alternative A2.	The nature of potential impacts would be similar to Alternative A. More acres of bedrock would be affected. Reconstruction along Pole Hill Road would reduce erosion associated with this ML2 road and have long-term beneficial effects for soils on National Forest System lands.	Potential impact factors would be the same as Alternative A. Soil disturbance acreages would be similar to Alternative C. More soil disturbance would result from trenching, possibly reducing soil productivity. Reconstruction along Pole Hill Road would reduce erosion associated with this ML2 road and have long-term beneficial effects for soils on National Forest System lands.	Potential impact factors would be the same as Alternative A. The greatest acreage of soils and bedrock would be affected under Alternative D.	Potential impact factors would be the same as Alternative A. Soils having low revegetation potential would be more extensive than Alternative A, the same as Alternative C, and less than Alternatives B and D. The extent of compaction-prone or water-erodible soils would be much less than Alternatives A, C, or D. Less newly acquired ROW would be needed than for Alternatives A, C, or D, reducing the potential for new soil impacts.	Natural causes and human activities would continue to affect soil resources at current levels. Impact characteristics associated with relocation of the line in part of the Newell Lake View development would be similar to Alternative A.
Water Resources and Floodplains	Impacts to surface water quantity and quality would be minor to negligible due to implementation of SCPs and compliance with permit provisions. Impacts to groundwater resources would be negligible. Measurable effects would be avoided within the Federal Emergency Management Agency (FEMA)-designated floodplain.	Compared with Alternative A, further potential for changes in runoff rates, flow turbidity and sedimentation, and spills or leaks would occur in areas of new access roads and ROW construction. Impacts to surface water quantity and quality or groundwater resources would be minor to negligible due to implementation of SCPs and compliance with permit provisions. Measurable effects would be avoided within the FEMA-designated floodplain.	Variant A2 would have impacts similar to Variant A1. In addition, construction for the underground portion of the ROW may encounter groundwater; if this occurred, it would be addressed in compliance with state permit approvals.	Potential impacts would generally be of the same type as Alternative A. Additional potential for impacts to existing runoff conditions, or flow turbidity and sedimentation would occur in the steep terrain near Meadowdale Ranch and Ravencrest areas. Potential impacts would be minor to negligible, and would be addressed similar to Alternative A. The FEMA-designated floodplain would be avoided.	Potential impacts would generally be the same as Alternative B. An area that may have shallow groundwater occurs along Alternative C at the east side of Pinewood Reservoir. Impacts to surface water or groundwater quantity and quality would be minor to negligible through implementation of SCPs and compliance with permit provisions.	Potential impacts would be the same as for Alternative C. Shallow groundwater also may be encountered where deeper excavation could occur for underground construction along the western 2.7 miles of the ROW.	The potential for impacts from ROW use and construction would be similar to Alternatives A and B. The reroute in the vicinity of Pinewood Reservoir would have the potential for shallow groundwater impacts similar to Alternative C. Implementation of SCPs and compliance with permit provisions would reduce impacts to minor or negligible levels.	Impacts to water resources quantity and quality would be minor to negligible due to implementation of SCPs and compliance with permit provisions. This alternative would cross fewer waterbodies and wetlands than any alternative except Alternative B. Areas of potential shallow groundwater in the Pinewood Reservoir locale would be avoided. The least amount of new transmission line ROW acquisition would occur; reducing the potential for increased runoff, flow turbidity, sedimentation, or impacts from spills during new disturbance.	Potential impacts to surface or groundwater quantity and quality would be similar to Alternatives A, B, and D, but would be spread out in space and time. Implementation of SCPs and compliance with permit provisions would limit impacts to minor or negligible levels. Negligible impacts to floodplains would occur.

Table 2.9-4 Comparison of Alternative Effects [1]

Resource	Alternative A	Alternative A1	Alternative A2	Alternative B	Alternative C	Alternative C1	Alternative D	Agency-Preferred Alternative (APA)	No Action Alternative
Wetlands and Waters of the U.S.	Agency policy is to avoid these sensitive areas where possible. Where disturbance cannot be avoided, impacts to drainage, adapted vegetation, and scarce habitats could occur. These effects would be avoided or mitigated by implementation of SCPs and EPMs.	The nature of impacts, their potential extent, and corresponding agency practices would be similar to Alternative A.	The nature of impacts and corresponding agency practices would be similar to Alternative A. Depending on underground construction techniques through wetlands and Waters of the U.S., the extent of impacts could be somewhat more or less than Alternative A.	The nature of impacts and corresponding agency practices would be similar to Alternative A. The potential for disturbing wetlands or Waters of the U.S. would be much less for Alternative B than Alternative A.	The nature of impacts and corresponding agency practices would be similar to Alternative A. The potential for disturbing wetlands or Waters of the U.S. would be similar to Alternative A.	The nature of impacts and corresponding agency practices would be similar to Alternative A. Depending on underground construction techniques through wetlands and Waters of the U.S., the extent of impacts could be somewhat more or less than Alternative A.	The nature of impacts and corresponding agency practices would be similar to Alternative A. The potential for disturbing wetlands or Waters of the U.S. would be much greater for Alternative D than Alternative A.	The nature of impacts and corresponding agency practices would be similar to Alternative A. The potential for disturbing wetlands or Waters of the U.S. would be slightly less than Alternative A. It is expected that all wetlands would be avoided by the final design.	The nature of impacts and corresponding agency practices would be similar to Alternative A. Fewer impacts would be anticipated than for other alternatives because of decreased construction disturbance.
Vegetation	Ponderosa pine, mixed conifer forest, mountain shrub mosaic, and upland meadow communities would be impacted by Project disturbance. Effects would include vegetation trampling, removal, or incidental disturbance. Approximately 70 percent of disturbance would occur in ponderosa pine communities.	The nature and extent of potential impacts to vegetation types would be the same as Alternative A. Slightly more disturbance would occur in the ponderosa pine community.	Potential impacts to vegetation types would be similar to Alternative A.	Potential impacts to vegetation types would be similar to Alternative A, but slightly less extensive. Fewer ponderosa pine woodlands would be affected (approximately 55 percent) and more mixed conifer forest, mountain shrub mosaic, and upland meadows would be affected.	Potential impacts to vegetation types would be similar to Alternative A, although slightly less ponderosa pine woodlands would be affected and more mixed conifer forest, mountain shrub mosaic, and upland meadows would be affected.	Potential impacts to vegetation types would be similar to Alternative A, although slightly less ponderosa pine woodlands and mixed conifer forest would be affected and more mountain shrub mosaic and upland meadows would be affected.	The nature of potential impacts to vegetation types would be similar to Alternatives A, B, and C, but the overall acreage of potential impacts would be much more extensive. Approximately 60 percent of the greater disturbance area would occur in ponderosa pine woodlands.	Potential impacts to vegetation types would be similar to Alternative A but slightly less extensive. Of the smaller acreage, fewer ponderosa pine woodlands would be affected (approximately 65 percent) and more mixed conifer forest, mountain shrub mosaic, and upland meadows would be affected.	Potential impacts to all vegetation types would be similar to Alternative D.
Special Status and Sensitive Plant Species	No federally listed species are found along Alternative A. Due to limited distribution of federally listed species and low quality of habitat, no impacts to these species would be expected. Potential impacts to sensitive plant species and species of concern would be minor and short-term due to limited surface disturbance in the ROW, and reclamation of disturbed areas.	Potential impacts would be the same as Alternative A.	Potential impacts would be the same as Alternative A.	Due to limited distribution of federally listed species and low quality of habitat, no impacts to these species would be expected. Potential impacts to sensitive plant species and species of concern would be minor and short-term due to limited surface disturbance in the ROW, and reclamation of disturbed areas.	Potential impacts would be the same as Alternative A.	Potential impacts would be the same as Alternative A.	Due to limited distribution of federally listed species and low quality of habitat, no impacts to these species would be expected. Potential impacts to sensitive plant species and species of concern would be minor and short-term due to limited surface disturbance in the ROW, and reclamation of disturbed areas.	Due to limited distribution of federally listed species and low quality of habitat, no impacts to these species would be expected. Potential impacts to sensitive plant species and species of concern would be minor and short-term due to limited surface disturbance in the ROW, and reclamation of disturbed areas.	Due to low quality of habitat and reduced surface disturbance, no impacts to federally listed species would be anticipated. Potential impacts to sensitive plant species and species of concern would be minor and short-term due to limited surface disturbance in the ROW, and reclamation of disturbed areas.
Wildlife Habitat	Elk and mule deer winter range, and moose winter range habitat would be affected by this alternative.	Elk and mule deer winter range, and moose winter range habitat would be affected by this alternative.	Elk and mule deer winter range, and moose winter range habitat would be affected by this alternative. The extent of impacts due would be somewhat greater than Alternative A.	Elk and mule deer winter range, and moose winter range habitat would be affected by this alternative. The nature and extent of impacts would be similar to Alternative A.	Elk and mule deer winter range, and moose winter range habitat would be affected by this alternative. The nature and extent of impacts would be similar to Alternatives A and B.	Elk and mule deer winter range, and moose winter range habitat would be affected by this alternative. The extent of impacts would be somewhat greater than Alternative A.	Elk and mule deer winter range, and moose winter range habitat would be affected by this alternative. The extent of impacts would be much greater than Alternatives A, B, or C.	Elk and mule deer winter range, and moose winter range habitat would be affected by this alternative. The nature and extent of impacts would be similar to Alternatives A, B, and C.	Acres of big-game habitat impacted would be similar to Alternative D.

Table 2.9-4 Comparison of Alternative Effects [1]

Resource	Alternative A	Alternative A1	Alternative A2	Alternative B	Alternative C	Alternative C1	Alternative D	Agency-Preferred Alternative (APA)	No Action Alternative
Raptors and Other Birds	Implementation of EPMs, as well as seasonal restrictions to prevent impacts to raptors and migratory birds potentially would minimize direct impacts. Additionally, based on conductor placement and orientation, electrocution would not pose a hazard to bird species. Remaining impacts (e.g., loss of habitat) are anticipated to be minor.	Potential impacts would be the same as Alternative A. There would be no risk of raptor collisions where the transmission line would be constructed underground.	Potential impacts would be the same as Alternative A. There would be no risk of raptor collisions where the transmission line would be constructed underground.	Potential impacts would be the same as Alternative A.	Potential impacts would be the same as Alternative A.	Potential impacts would be the same as Alternative A. There would be reduced risk of raptor collisions where the transmission line would be constructed underground.	Potential impacts would be the same as Alternative A.	Potential impacts would be the same as Alternatives A, B, and C.	Displacement of upland game birds, raptors, and other birds as a result of increased human activity during maintenance activities would be short-term and minor. Relocation of the line would result in potential impacts similar to Alternative A.
Special Status and Sensitive Wildlife Species Habitat Disturbance	Vegetation communities in the ROW that support special status and sensitive wildlife species would be affected.	Vegetation communities in the ROW that support special status and sensitive wildlife species would be affected at the same level as Alternative A	Vegetation communities in the ROW that support special status and sensitive wildlife species would be affected at approximately the same level as Alternative A.	Vegetation communities in the ROW that support special status and sensitive wildlife species would be affected at a greater level than Alternative A.	Vegetation communities in the ROW that support special status and sensitive wildlife species would be affected at approximately the same level as Alternative A.	Vegetation communities in the ROW that support special status and sensitive wildlife species would be affected at approximately the same level as Alternative A.	Much greater extent of vegetation communities in the ROW that support special status and sensitive wildlife species would be affected than any other alternative.	Vegetation communities in the ROW that support special status and sensitive wildlife species would be affected at approximately the same level as Alternative A	Fewer acres of vegetation communities in the ROW that support special status and sensitive wildlife species would be affected than any action alternative.
Land Use and Recreation Land Use	Long-term adverse impacts to land use from the acquisition of new or expanded ROW would range from negligible to moderate depending on the location and ownership of the acquired ROW. Beneficial effects where existing ROW would be decommissioned.	Impacts are similar to A; however, Variant A1 would require slightly more acres of new ROW.	Impacts are similar to A; however, Variant A2 would require slightly less acres of new ROW.	Impacts are similar to A; however, Alternative B requires the fewest acres of ROW acquisition.	Impacts are similar to A; however, Variant A1 would require less acres of new ROW.	Impacts are similar to A; however, Variant C1 would require less acres of new ROW.	The nature of potential impacts would be similar to Alternative A; however, Alternative D would maintain two ROWs and therefore requires the most ROW acquisition. The beneficial effects of ROW consolidation would not be realized under this alternative.	The APA would require much less acquisition of new ROW than any other alternative except Alternative B. The number of landowners with ROW to be decommissioned would be slightly greater than Alternatives A or B, and much greater than Alternatives C, D, or the No Action.	Existing ROWs would be expanded to a minimum width of 75 feet. New ROW would be acquired to relocate the line from Newell Lake View subdivision (through which there is inadequate ROW). The beneficial effects of ROW consolidation would not be realized.

Table 2.9-4 Comparison of Alternative Effects [1]

Resource	Alternative A	Alternative A1	Alternative A2	Alternative B	Alternative C	Alternative C1	Alternative D	Agency-Preferred Alternative (APA)	No Action Alternative
Recreation	Potential short- and long-term impacts to recreation from access roads, staging areas, and construction and maintenance activities would range from negligible to moderate depending on the location and timing of activities. The long-term recreational experience would be enhanced in areas where existing transmission line would be decommissioned.	Potential impacts would be the same as Alternative A.	Potential impacts would be the same as Alternative A.	Short-term recreation opportunities on the Besant Point Trail could be affected depending on the timing of construction. Long-term impacts would include effects to the four-wheel drive recreational setting on West Pole Hill Road caused by the steel structures. Any potential change to the ROS classification resulting from the new structures would result in a Forest Service Plan Amendment. Other potential impacts to recreation would be similar to Alternative A.	Moderate short- and long-term impact to the recreation setting and recreation facilities along the east side of Pinewood Reservoir County Park. Other potential impacts to recreation would be similar to Alternative A. Four-wheel drive recreation opportunities would be significantly adversely impacted on sections of USFS Road 122 that would be reconstructed. Reconstruction on sections of USFS Road 122 also would result in adverse and beneficial effects to dispersed recreation.	Moderate short- and long-term impact to the recreation setting and recreation facilities along the east side of Pinewood Reservoir County Park. Other potential impacts to recreation would be similar to Alternative A. Four-wheel drive recreation opportunities would be significantly adversely impacted on sections of USFS Road 122 that would be reconstructed. Reconstruction on sections of USFS Road 122 also would result in adverse and beneficial effects to dispersed recreation.	Moderate short- and long-term impact to the recreation settings would occur along the east side of Pinewood Reservoir County Park. Other potential impacts to recreation would be similar to Alternative A. The beneficial effects of ROW consolidation would not be realized under this alternative.	Potential impacts to recreation would be similar to Alternative A. Under the APA, the four-wheel drive portion of USFS Road 122 would not be reconstructed resulting in no significant adverse impacts to recreation resources.	Moderate short- and long-term impact to recreation settings along would occur on the east side of Pinewood Reservoir County Park. Negligible to minor adverse effects to recreation settings would occur where additional ROW would need to be acquired. The beneficial effects of ROW consolidation would not be realized under this alternative.
Visual Resources	New, taller structures and associated disturbance would result in short- and long-term adverse effects ranging from minor to moderate with localized strong visual changes. Long-term beneficial effects would occur where the South Line would be removed, such as within the Newell Lake View subdivision. Moderate adverse effects would occur from new access roads and vegetation management	Potential impacts would be the same as Alternative A, except for along 0.5 mile of U.S. Highway 36 where the adverse effect would be greater.	Potential impacts would be the same as Alternative A, except for the underground segment near Estes Park which would result in no overhead transmission line structures, but may produce a more visually noticeable cleared ROW.	Incremental adverse effects would occur to Chimney Hollow Open Space, Pinewood Lake, Meadowdale Hills and Ravencrest subdivisions, and U.S. Highway 36. Conversely, beneficial effects would occur to the Newell Lake View subdivision and the valley between Mount Pisgah and Mount Olympus as seen from the Estes Valley as a result of abandonment of an entire ROW. Other potential impacts to scenic resources would be similar to Alternative A.	Incremental adverse effects would occur to Chimney Hollow Open Space, and Meadowdale Hills and Ravencrest subdivisions, and along 0.75 mile of U.S. Highway 36. Conversely, beneficial effects would occur to the Newell Lake View subdivision and the valley between Mount Pisgah and Mount Olympus as seen from the Estes Valley as a result of abandonment of an entire ROW. Other potential impacts to scenic resources would be similar to Alternative A.	Potential impacts would be the same as Alternative C, except for the underground segment near Estes Park which would result in no overhead transmission line structures, but may produce a more visually noticeable cleared ROW.	Potential long-term impacts would be the similar as the No Action Alternative. Beneficial changes would result within the Newell Lake View subdivision. Moderate adverse effects would occur from new access roads and vegetation management similar to Alternative A.	Incremental adverse effects would occur to Chimney Hollow Open Space, Pinewood Lake, Meadowdale Hills and Ravencrest subdivisions, and along U.S. Highway 36. Conversely, beneficial effects would occur to the Newell Lake View subdivision and the valley between Mount Pisgah and Mount Olympus as seen from the Estes Valley as a result of abandonment of an entire ROW. Other potential impacts to scenic resources would be similar to Alternative A.	Minor adverse to moderate impacts from visible portions of the two existing transmission lines and ongoing structure replacement and vegetation maintenance activities would continue similar to existing conditions. Beneficial changes would result within the Newell Lake View subdivision.

Table 2.9-4 Comparison of Alternative Effects [1]

Resource	Alternative A	Alternative A1	Alternative A2	Alternative B	Alternative C	Alternative C1	Alternative D	Agency-Preferred Alternative (APA)	No Action Alternative
Socioeconomics and Community Resources	Beneficial effects associated with job opportunities and to the economic base would be temporary and minor. Some potential for minor, short-term decreases in property values as a result of taller structures, and conversely minor increases in property values where structures would be removed. No environmental justice concerns were identified.	Potential impacts would be the same as Alternative A.	Estimated 80-year life cycle costs would increase approximately 120 percent relative to Alternative A. Some potential for minor, short-term decreases in property values as a result of taller structures, and conversely minor increases in property values where structures would be removed. Residences near the underground portion of the variant may experience a minor increase in property values. No environmental justice concerns were identified.	Potential impacts would be the same as Alternative A. Estimated 80-year life cycle costs would be reduced to approximately 92 percent of Alternative A. Some potential for minor, short-term decreases in property values as a result of taller structures, and conversely minor increases in property values where structures would be removed. No environmental justice concerns were identified.	Potential 80-year life cycle costs would be similar to Alternative A. Reconstruction of Pole Hill Road would result in significant short-term and long-term effects to a USFS permittee that leads four-wheel drive tours in the West Pole Hill area. Some potential for minor, short-term decreases in property values as a result of taller structures, and conversely minor increases in property values where structures would be removed. No environmental justice concerns were identified.	Estimated 80-year life cycle costs would increase approximately 108 percent relative to Alternative A. Reconstruction of Pole Hill Road would result in significant short-term and long-term effects to a USFS permittee that leads four-wheel drive tours in the West Pole Hill area. Some potential for minor, short-term decreases in property values as a result of taller structures, and conversely minor increases in property values where structures would be removed. Residences near the underground portion of the variant may experience a minor increase in property values. No environmental justice concerns were identified.	Beneficial effects associated with job opportunities and to the economic base would be temporary and minor. Minor decreases in property values as a result of taller structures. Alternative D would maintain two ROWs and the beneficial effects to property values from ROW decommissioning would not be realized, except where the line would be relocated from Newell Lake View subdivision to Pole Hill Road. Estimated 80-year life cycle costs would increase approximately 170 percent relative to Alternative A. No environmental justice concerns were identified.	Potential impacts would be similar to Alternative A. Estimated 80-year life cycle costs would be reduced to approximately 89 percent of Alternative A. Some potential for minor, short-term decreases in property values as a result of taller structures, and conversely minor increases in property values where structures would be removed. No environmental justice concerns were identified.	Potential impacts include increased maintenance costs as existing lines age and require more maintenance. The No Action Alternative would maintain two ROWs and the beneficial effects to property values from ROW decommissioning would not be realized, except where the line would be relocated from Newell Lake View subdivision to Pole Hill Road. Estimated 80-year life cycle costs would increase approximately 190 percent relative to Alternative A. No environmental justice concerns were identified.
Electrical Effects and Human Health	Effects associated with noise, radio and television interference, and induced current and voltage, as well as effects to cardiac pacemakers would be negligible; SCPs would further minimize noise and induced current and voltage. EMF levels would be less than the existing transmission lines. Health effects would be similar to or less than existing lines.	Potential effects would be the same as Alternative A.	Potential effects would be the same as Alternative A, except that electrical fields would be blocked by the soil where the transmission line is constructed underground and would not be a concern. Additionally, magnetic fields would be higher than those produced by aboveground lines, but would still represent a negligible impact.	Potential effects would be the same as Alternative A.	Potential effects would be the same as Alternative A.	Potential effects would be the same as Alternative A, except that electrical fields would be blocked by the soil where the transmission line is constructed underground and would not be a concern. Additionally, magnetic fields would be higher than those produced by aboveground lines, but would still represent a negligible impact.	Potential effects would be the same as Alternative A.	Potential effects would be the same as Alternative A.	Electric fields at the ROW edge, and magnetic fields within the ROW, would be higher than for action alternatives, although the potential effects would be the similar to Alternative A.

Table 2.9-4 Comparison of Alternative Effects [1]

Resource	Alternative A	Alternative A1	Alternative A2	Alternative B	Alternative C	Alternative C1	Alternative D	Agency-Preferred Alternative (APA)	No Action Alternative
Cultural Resources	A total of 6 historic properties, 2 contributing elements of the CBT Project Historic District, and 2 unevaluated sites have been documented along this alternative. Unavoidable adverse effects would be minimized through a treatment plan, and through implementation of SCPs.	A total of 6 historic properties, 2 contributing elements of the CBT Project Historic District, and 2 unevaluated sites have been documented along this alternative. Minimization of adverse effects would be the same as Alternative A.	A total of 6 historic properties, 2 contributing elements of the CBT Project Historic District, and 2 unevaluated sites have been documented along this alternative. Minimization of adverse effects would be the same as Alternative A.	A total of 8 historic properties and 2 contributing elements of the CBT Project Historic District have been documented along this alternative. Minimization of adverse effects would be the same as Alternative A.	A total of 9 historic properties and 2 contributing elements of the CBT Project Historic District have been documented along this alternative. Minimization of adverse effects would be the same as Alternative A.	A total of 9 historic properties and 2 contributing elements of the CBT Project Historic District have been documented along this alternative. Minimization of adverse effects would be the same as Alternative A.	A total of 12 historic properties, 4 contributing elements of the CBT Project Historic District, and 2 unevaluated sites have been documented along this alternative. Minimization of adverse effects would be the same as Alternative A.	Potential impacts would be similar to Alternatives B and C. Minimization of adverse effects would be the same as Alternative A.	A total of 12 historic properties, 4 contributing elements of the CBT Project Historic District, and 1 unevaluated site have been documented along this alternative. At this time, no inventories have been conducted along the line that would be relocated.
Transportation	Potential direct and indirect impacts would be less than significant due to low levels of Project-generated traffic. This alternative requires 1.3 miles of temporary access and 1.3 miles of permanent access on National Forest System land.	Potential impacts would be similar to Alternative A.	Potential impacts would be similar to Alternative A.	Potential direct and indirect impacts would be less than significant due to low levels of Project-generated traffic. This alternative requires 1.7 miles of temporary access and 0.8 mile of permanent access on National Forest System land.	Potential direct and indirect impacts would potentially be significant due to creation of road conditions that would require frequent and recurring roadway repair and maintenance. This alternative requires 1.7 miles of temporary access and 0.8 mile of permanent access on National Forest System land. Increased recreational traffic on Pole Hill Road under Alternative C resulting from the reconstruction of USFS Road 122 would potentially create road conditions that would require frequent and recurring roadway repair and maintenance, causing significant adverse impacts to transportation.	Potential direct and indirect impacts would potentially be significant due to creation of road conditions that would require frequent and recurring roadway repair and maintenance. This alternative requires 1.7 miles of temporary access and 0.8 mile of permanent access on National Forest System land. Increased recreational traffic on Pole Hill Road under Alternative C1 resulting from the reconstruction of USFS Road 122 would potentially create road conditions that would require frequent and recurring roadway repair and maintenance, causing significant adverse impacts to transportation.	Potential direct and indirect impacts would be less than significant due to low levels of Project-generated traffic. This alternative requires 2.5 miles of permanent access on National Forest System land.	Potential impacts from miles of temporary and permanent access on National Forest System land would be similar to Alternatives B and C; however, under the APA, the four-wheel drive portion of USFS Road 122 would not be reconstructed resulting in no significant adverse impacts.	Potential direct and indirect impacts would be less than significant due to low levels of Project-generated traffic. There would be no new temporary or permanent access authorized on National Forest System lands.

[1] Note: Impacts summarized in this Chapter 2.0 table were determined as described in Chapter 4.0 with implementation of design criteria, SCPs, and EPMs.

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3.0 Affected Environment

3.1 Introduction

As described in Section 2.2.1, Development of Alternative Alignments, upon completion, the action alternatives would have an operating ROW of 110 feet for aboveground alignments, and 75 feet for underground alignments. Because some resources can be impacted outside of the ROW (e.g., air, water or human resources) the Project area for affected environment varies by resource and is defined at the beginning of each resource section.

Chapter 3.0 provides descriptions of the existing environmental conditions for physical, biological, and human resources in the Project vicinity that may be impacted by constructing and/or operating the Project. Physical resources described include air quality, water resources, geology and paleontology, and soil resources. Biological resources described include wetlands and waters of the U.S., vegetation, special status plant species, wildlife, and special status wildlife species. Human resources include socioeconomics and community resources (including environmental justice), visual resources, cultural resources, transportation, recreation, land use, electrical effects and human health, and accidents and intentional destructive acts. All of these together constitute the human environment as defined by NEPA, 40 CFR Part 1508.14. Federal, state, and local regulations that apply to managing these resources also are discussed in context to the existing environment. Specific impacts from constructing and operating the Project are discussed in Chapter 4.0.

3.2 Air Quality

This section describes the climate and existing air quality resource of the region and the applicable air regulations that would apply to the proposed alternatives. The study area for direct air quality impacts is the area within 3.1 miles of the Project area.

3.2.1 Climate

The climate in the eastern portion of the area is characterized as arid, with cold winters and warm summers. The climate in the western segments, including Estes Park, is greatly affected by the mountain ranges, both elevation and aspect. Annual precipitation (rainfall and snowfall) in the Project area ranges from 12 inches to well over 25 inches and is highly dependent on elevation and aspect of the terrain.

Annual total recorded precipitation (rainfall) in the Estes Park area from February 1, 1896, to May 31, 1994, averaged 16 inches; total annual recorded snowfall averages for the same period are approximately 70 inches. Average maximum temperatures range from 37.7 degrees Fahrenheit (°F) in January to 78.2°F in July. Waterdale, Colorado, located about 4.5 miles northeast of the Flatiron Substation at an elevation of 5,200 feet above mean sea level (amsl), recorded an annual total precipitation (rainfall) of approximately 16 inches; total annual recorded snowfall averages for the same period are 44 inches (period of record January 1, 1902, to September 30, 2012). During that same period, average maximum temperatures ranged from a low in January of approximately 43°F to a high in July of approximately 87°F.

3.2.2 Applicable Laws and Regulations

Federal actions must conform to the CAA. The USEPA has primary Federal responsibility for implementing the CAA. In Colorado, the CDPHE Air Pollution Control Division (APCD) administers CAA requirements. To comply with the requirements of the CAA, the State of Colorado has developed a State Implementation Plan (SIP). The SIP describes how Colorado ensures compliance with the CAA.

Regional air basins are classified by the CDPHE-APCD. The Project is located within the Denver Metro/North Front Range Region (CDPHE 2011). This region encompasses Larimer County, including Rocky Mountain National Park. Standards for six criteria pollutants have been identified by the USEPA:

particulate matter (PM), ozone (O_3), carbon monoxide (CO), sulfur oxides, nitrogen oxides (NO_X), and lead (Pb).

PM_{10} consists of particulate matter equal to or smaller than 10 microns is size that is suspended in the atmosphere. PM_{10} is generated from sources such as windblown dust and soil from roads, fields and construction sites. $PM_{2.5}$ particles consist of solid or volatile particles up to 2.5 micron size. Sources of $PM_{2.5}$ include combustion products emitted from forest fires or engines, and also can form when gases from power plants, industries, and automobiles react in the air. The area in the vicinity of the Project currently meets the Federal standards for PM_{10} and $PM_{2.5}$.

Under the Federal CAA and Amendments, proposed new stationary sources of air pollutants are required to obtain construction and then operating permits for the sources in question. Larger sources that are required to obtain permits must address Prevention of Significant Deterioration (PSD), New Source Performance Standards, visibility protection, and the general conformity provisions of the CAA and Amendments as part of their permitting effort.

Since the area is nonattainment (does not meet or attain National Ambient Air Quality Standards (NAAQS), the Project will be required to demonstrate compliance with the general conformity provisions of the CAA and Amendments. With respect to compliance with the General Conformity provisions, development of a SIP was required, to present measures that would result in compliance with the NAAQS for O_3. Such a plan was submitted to USEPA, approved and addresses reductions of emissions of the photochemically active precursors of ozone formation - specifically nitrogen dioxide (NO_2) and volatile organic compounds (VOCs), primarily as emitted from internal combustion processes and most commonly as vehicular emissions. All such sources of emissions operated in support of execution of the Project must be compliant with the conformity plan.

3.2.3 Air Pollutants of Potential Concern

Of the air pollutants listed above, those of potential concern are particulate matter from disturbed soils, particulates from combustion of fuel, NO_X, and CO. The sources of these pollutants include construction, dust and particulate emissions from roads, tailpipe emissions, and off-road vehicle traffic.

Particulates would occur primarily from short-term construction-related activities or short-term maintenance activities that may generate fugitive dust; and to a lesser degree, from tailpipe emissions, such as diesel exhaust from construction or maintenance vehicles.

3.2.4 Photochemical Oxidants

When corona is present, the air surrounding the conductors is ionized and many chemical reactions take place, producing small amounts of ozone and other oxidants. Approximately 90 percent of oxidants are ozone and the remainder mainly nitrogen oxides.

The NAAQS for photochemical oxidants, of which ozone is the principal component, is 235 micrograms per cubic meter ($\mu g/m^3$) or 120 parts per billion (ppb).

3.2.5 National Ambient Air Quality Standards

The criteria for potential air quality impacts include NAAQS requirements for CO, PM_{10}, $PM_{2.5}$, sulfur dioxide (SO_2), and NO_2/NO_X. Applicable Federal and state criteria are presented in **Table 3.2-1**. Primary Standards are established to protect human health and secondary standards to protect the environment. Units of measure for the standards are parts per million (ppm) by volume, ppb by volume, and $\mu g/m^3$. The current NAAQS for PM are:

- 24-hour average PM_{10} concentration is not to exceed 150 μg/m^3 more than once per year;
- 3-year average of the 98th-percentile 24-hour average $PM_{2.5}$ concentration is not to exceed 35 μg/m^3 more than once per year; and
- 3-year average of the annual mean $PM_{2.5}$ concentration is not to exceed 15 μg/m^3.

Table 3.2-1 National and State Ambient Air Quality Standards

Pollutant [final rule cite]		Primary/ Secondary	Averaging Time	Level	Form
Carbon monoxide [76 FR 54294, Aug. 31, 2011]		Primary	8-hour	9 ppm	Not to be exceeded more than once per year
			1-hour	35 ppm	
Lead [73 FR 66964, Nov. 12, 2008]		Primary and secondary	Rolling 3-month average	0.15 μg/m^3 [1]	Not to be exceeded
Nitrogen dioxide [75 FR 6474, Feb. 9, 2010] [61 FR 52852, Oct. 8, 1996]		Primary	1-hour	100 ppb	98th percentile, averaged over 3 years
		Primary and secondary	Annual	53 ppb [2]	Annual Mean
Ozone [73 FR 16436, Mar. 27, 2008]		Primary and secondary	8-hour	0.075 ppm [3]	Annual fourth-highest daily maximum 8-hour concentration, averaged over 3 years
Particle pollution Dec. 14, 2012	$PM_{2.5}$	Primary	Annual	12 μg/m^3	98th percentile, averaged over 3 years
		Secondary	Annual	15 μg/m^3	Annual mean, averaged over 3 years
		Primary and secondary	24-hour	35 μg/m^3	98th percentile, averaged over 3 years
	PM_{10}	Primary and secondary	24-hour	150 μg/m^3	Not to be exceeded more than once per year
Sulfur dioxide [75 FR 35520, June 22, 2010] [38 FR 25678, Sept. 14, 1973]		Primary	1-hour	75 ppb [4]	99th percentile of 1-hour daily maximum concentrations, averaged over 3 years
		Secondary	3-hour	0.5 ppm	Not to be exceeded more than once per year

1 Final rule signed October 15, 2008. The 1978 lead standard (1.5 μg/m^3 as a quarterly average) remains in effect until one year after an area is designated for the 2008 standard, except that in areas designated nonattainment for the 1978, the 1978 standard remains in effect until implementation plans to attain or maintain the 2008 standard are approved.

2 The official level of the annual nitrogen dioxide standard is 0.053 ppm, equal to 53 ppb, which is shown here for the purpose of clearer comparison to the 1-hour standard.

3 Final rule signed March 12, 2008. The 1997 O_3 standard (0.08 ppm, annual fourth-highest daily maximum 8-hour concentration, averaged over 3 years) and related implementation rules remain in place. In 1997, USEPA revoked the 1-hour ozone standard (0.12 ppm, not to be exceeded more than once per year) in all areas, although some areas have continued obligations under that standard ("anti-backsliding"). The 1-hour O_3 standard is attained when the expected number of days per calendar year with maximum hourly average concentrations above 0.12 ppm is less than or equal to 1.

4 Final rule signed June 2, 2010. The 1971 annual and 24-hour SO_2 standards were revoked in that same rulemaking. However, these standards remain in effect until one year after an area is designated for the 2010 standard, except in areas designated nonattainment for the 1971 standards, where the 1971 standards remain in effect until implementation plans to attain or maintain the 2010 standard are approved.

μg/m^3 = micrograms per cubic meter, ppb = part per billion, ppm = part per million, $PM_{2.5}$ = particulate matter 2.5 microns or less, PM_{10} = particulate matter 10 microns or less.

Source: USEPA 2012.

3.2.5.1 Ozone

In 2007, the Denver Metro/North Front Range region exceeded the Federal ozone standard and its status was changed to nonattainment. Ozone is not typically emitted directly from an individual source, but instead forms as a result of other precursors that are transformed by photo-chemical reactions in the atmosphere. Emissions from motor vehicles, industry, and even vegetation contribute to ozone formation.

Breathing air containing ozone can reduce lung function and increase respiratory symptoms, thereby aggravating asthma or other respiratory conditions. Ozone exposure may contribute to premature death, especially in people with heart and lung disease. High ozone levels also can harm sensitive vegetation and forested ecosystems (USEPA 2012). Recent 2012 monitoring results for ozone near the Project area would indicate that ozone continues to exceed the NAAQS. **Table 3.2-2** shows the Ozone Monitored Values in Larimer County during 2012.

Table 3.2-2 Larimer County Ozone Monitored Values 2012

First Max (ppm)	Second Max (ppm)	Third Max (ppm)	Fourth Max (ppm)	Number of Exceedences	Location
0.090	0.087	0.081	0.081	15	Rocky Mountain National Park
0.093	0.086	0.086	0.08	13	Fort Collins
0.094	0.080	0.075	0.074	2	Fort Collins
0.086	0.084	0.079	0.077	5	Estes Park

ppm = parts per million.

3.2.6 Particulate Matter

Natural sources of PM are dust generated by wind erosion of disturbed soil surfaces and wild land fire. Areas cleared of vegetation are particularly susceptible to dust generation and recent (2012) wildfires in Larimer County caused elevated levels of PM_{10} and $PM_{2.5}$ in the vicinity of the Project. Wildfires generally are considered exceptional events and do not cause an area to be declared nonattainment.

The size of PM is important from a human health perspective. There are three common size classifications of PM: the largest size classification is Total Suspended Particulate; the second largest classification is PM_{10}; and the third size classification is designated $PM_{2.5}$.

3.2.7 Prevention of Significant Deterioration

In addition to the designations relative to attainment of conformance with the NAAQS, the CAA requires the USEPA to place selected areas within the U.S. into one of three categories, which are designed to limit the deterioration of air quality when it is better than the NAAQS. Class I is the most restrictive air quality category. It was created by Congress to prevent further deterioration of air quality in national parks and wilderness areas of a given size, which were in existence prior to 1977, or those additional areas that have since been designated Class I under Federal regulations (40 CFR 52.21). The closest Class I area to the Project area is Rocky Mountain National Park (2 miles to the west of the westernmost part of the Project). Areas outside of the designated Class I boundaries are designated as Class II areas, which are allowed a relatively greater deterioration of air quality, although it must still be maintained below NAAQS. No Class III areas have been designated in the U.S.

3.3 Geology and Paleontology

3.3.1 Geology

The Project is mainly located in the Rolling Upland of the Southern Rocky Mountain physiographic province (Cole and Braddock 2009; Fenneman 1928). The extreme eastern portion of the Project area is in the Foothills Hogbacks of the Colorado Piedmont province. Elevations along the Project area range from 5,500 feet above sea level at Flatirons Reservoir up to around 8,600 feet above sea level where the ROW crosses the Rolling Upland. The major drainages, such as the Big Thompson and Saint Vrain Rivers, drain west to east.

The existing transmission lines primarily cross very old Precambrian intrusive and metamorphic rocks (**Figures 3.3-1a** through **3.3-1d**). Much younger sedimentary rocks occur at the southern end of Pinewood Reservoir and at the Project's Flatiron Reservoir terminus (Cole and Braddock 2009). **Table 3.3-1** includes a summary of geologic age and map symbols used for geologic formations crossed by the Project.

Younger Precambrian intrusive rocks crossed by the existing transmission lines include the Longs Peak granite (YgLP) and associated pegmatite (YXp). A pegmatite is composed of coarse-grained granitic crystalline rock that may contain higher concentrations of elements not found in typical granites. Longs Peak granite was intruded around 1,420 million years ago, plus-or-minus 25 million years. The age of the pegmatite is uncertain and may be similar to the Longs Peak granite or older (Cole and Braddock 2009).

Older Precambrian intrusive rocks traversed by the existing transmission lines include granodiorite (Xgd) and Thompson Canyon trondhjemite (XjT). The granodiorite (an intrusive igneous rock with large amounts of the minerals biotite and horneblend) was emplaced in separate bodies around 1,714 million years ago, plus-or-minus 5 million years (Cole and Braddock 2009). The Thompson Canyon trondhjemite (light-colored igneous intrusive rock with abundant amounts of plagioclase and quartz) was intruded about 1,726 million years ago, plus-or-minus 15 million years.

The Precambrian metamorphic rocks traversed by the transmission lines include knotted mica schist (Xbk) and quartzofeldspathic mica schist (Xbq). The age of metamorphism is 1,713 million years ago, plus-or-minus 30 million years (Cole and Braddock 2009).

The Pennsylvanian-aged Fountain Formation (PlPf) unconformably overlies the Precambrian rocks. Along the Front Range, the Fountain Formation forms flatiron outcrops that dip steeply to the east. The Fountain Formation accumulated in alluvial fans and coastal-plain environments about 260 to 250 million years ago during Middle Pennsylvanian to Late Pennsylvanian/Lower Permian time (Cole and Braddock 2009). This sedimentary deposit originated as sediments eroded from the Ancestral Rocky Mountains and includes reddish-brown to purplish-gray feldspar-rich conglomerates, trough cross bedded medium- to coarse-grained feldsparrich sandstone, dark reddish-brown siltstone and shale, and thin localized limestone beds (Cole and Braddock 2009).

Deposits of much younger Late Pleistocene and modern colluvium (Qc) present in the area consist of materials that range in size from silt to boulders. These deposits were produced by a variety of interacting mass-wasting processes: chemical weathering, erosion, frost action, and slope angle. Deposited along the valley floor, these deposits may have accumulated piecemeal over long spans of time or episodically as the result of one or more landslides or avalanches. As mapped by Cole and Braddock (2009), this geological mapping unit includes small-area deposits.

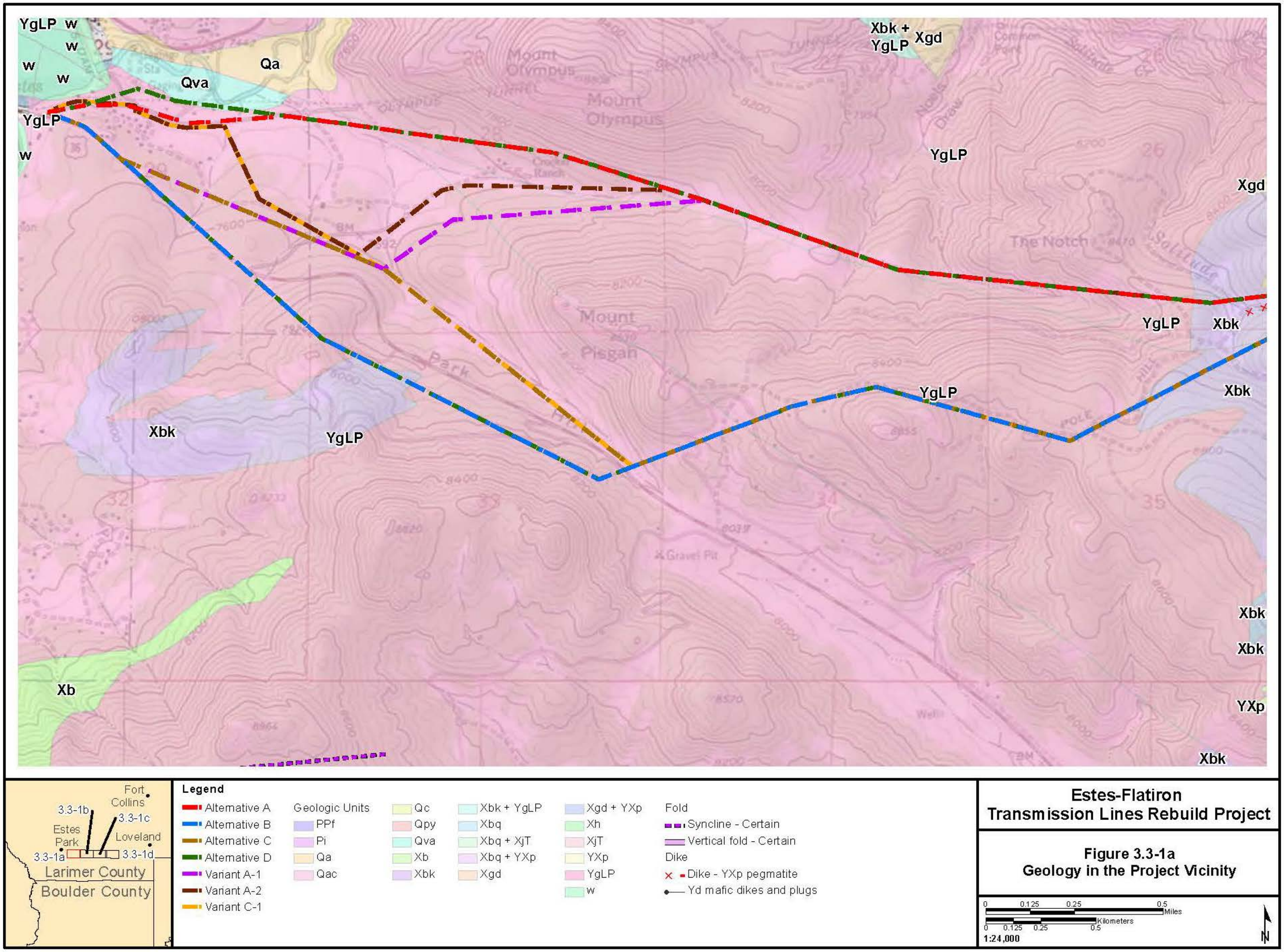
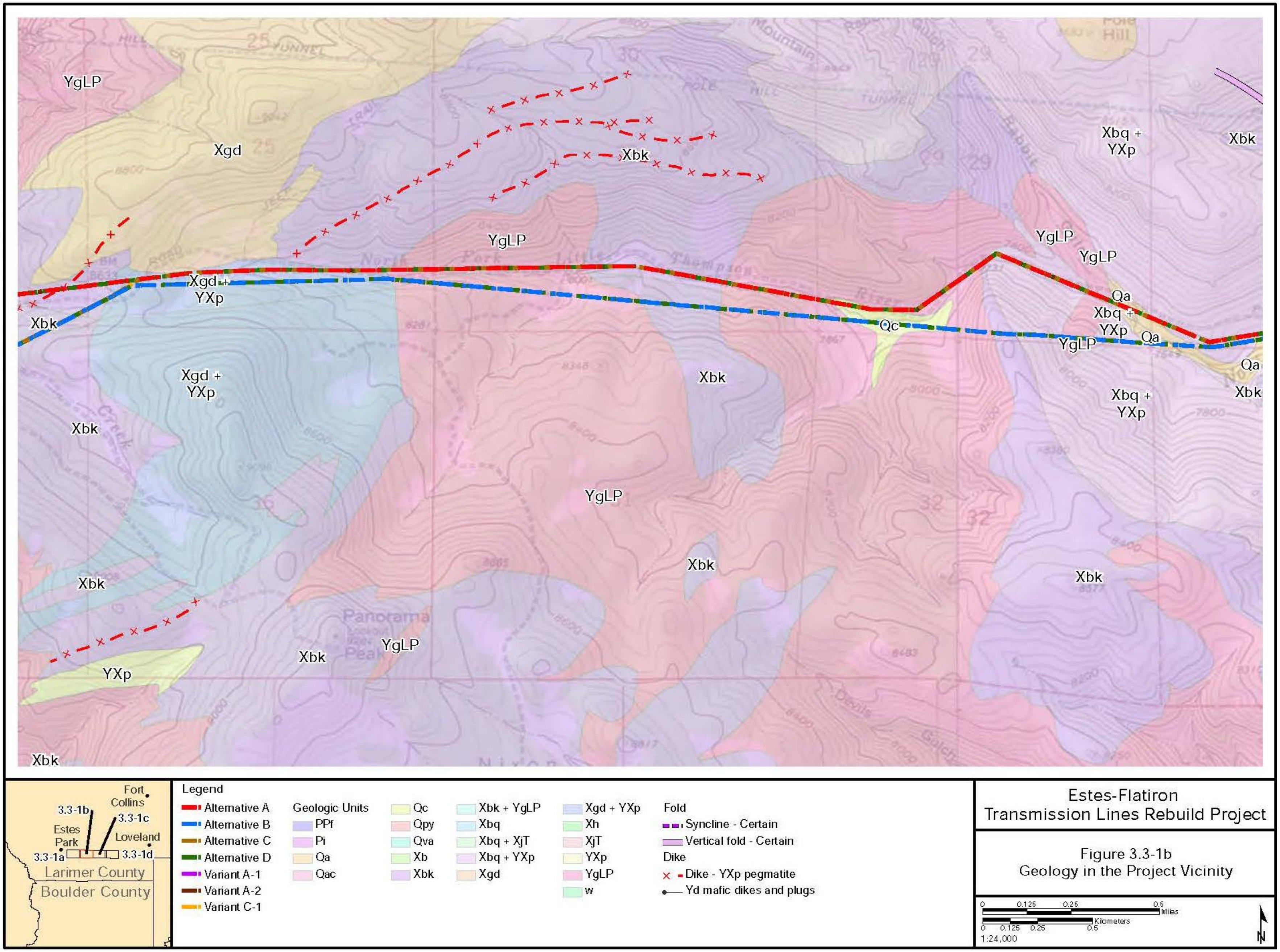
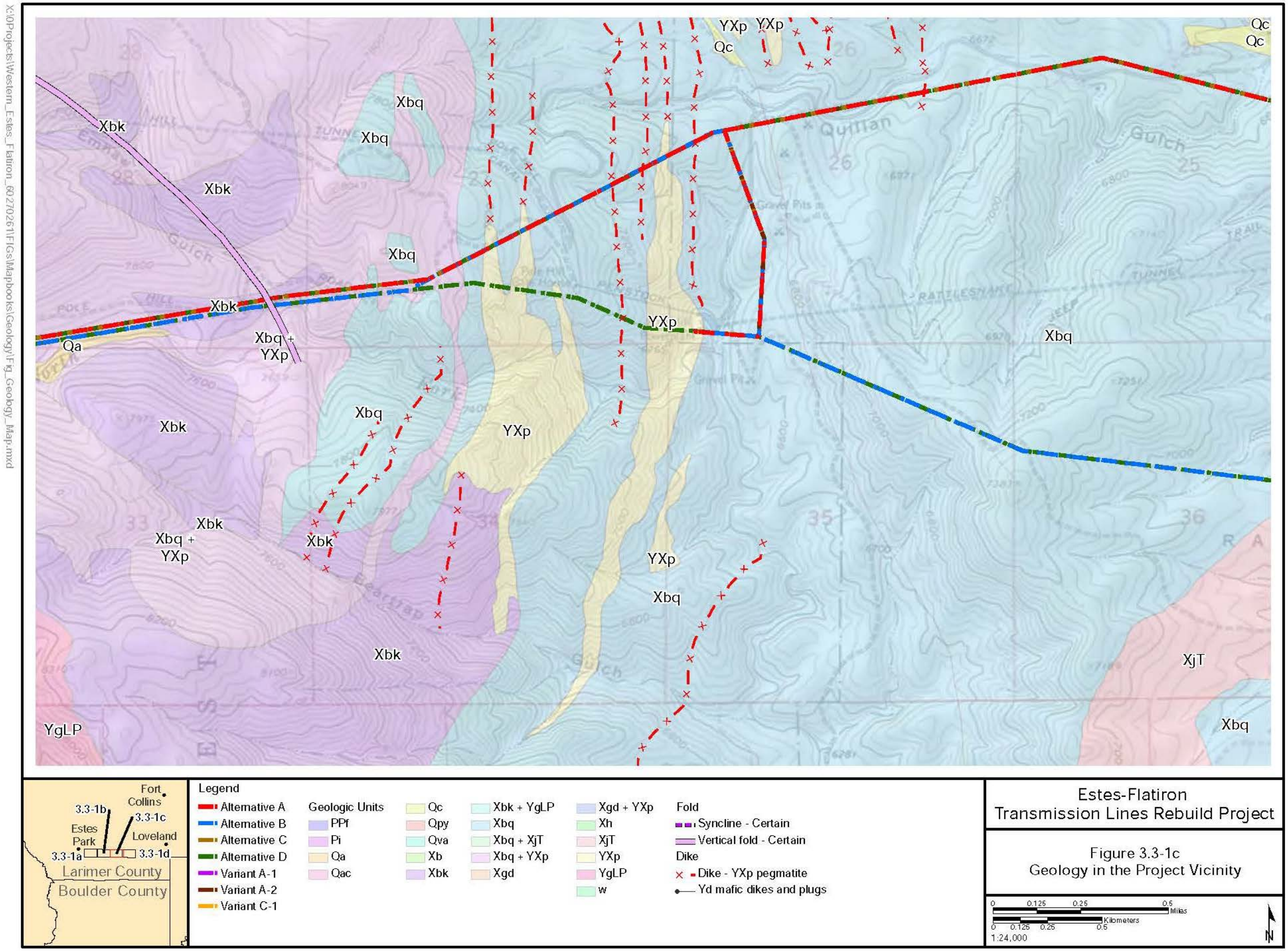


Figure 3.3-1a
Geology in the Project Vicinity



Estes-Flatiron Transmission Lines Rebuild Project

Figure 3.3-1b
Geology in the Project Vicinity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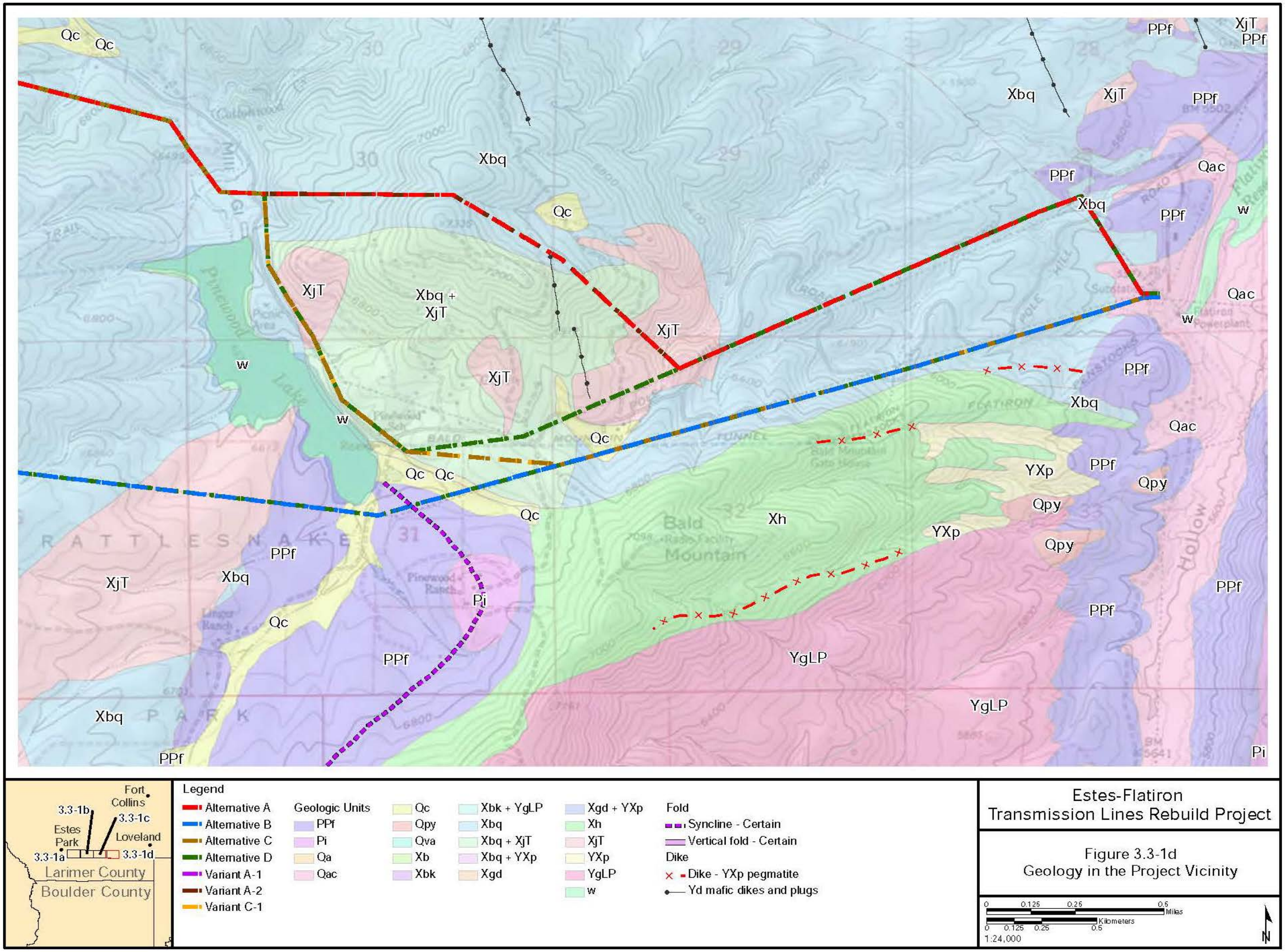
Legend
Alternative A
Alternative B
Alternative C
Alternative D
Variant A-1
Variant A-2
Variant C-1
Geologic Units
PPf
Pi
Qa
Qac
Qc
Qpy
Qva
Xb
Xbk
Xbk + YgLP
Xbq
Xbq + XjT
Xbq + YXp
Xgd
Xgd + YXp
Xh
XjT
YXp
YgLP
w
Fold
Syncline - Certain
Vertical fold - Certain
Dike
Dike - YXp pegmatite
Yd mafic dikes and plugs
Fort Collins
Estes Park
Loveland
Larimer County
Boulder County
3.3-1a
3.3-1b
3.3-1c
3.3-1d
Estes-Flatiron Transmission Lines Rebuild Project
Figure 3.3-1c
Geology in the Project Vicinity
1:24,000
Miles
Kilometers



Estes-Flatiron Transmission Lines Rebuild Project

Figure 3.3-1d
Geology in the Project Vicinity

Table 3.3-1 Stratigraphic Chart, Project Vicinity

Era	Eon/Period	Series	Age (Ma)[1]	Formation*/Map Symbol
Cenozoic	Quaternary	Holocene	< .015	Alluvium (Qa) Alluvium and colluvium (Qac) Colluvium (Qc) Mountain valley alluvium (Qva)
		Pleistocene	0.1-<0.015	Alluvium (Qa) Alluvium and colluvium (Qac) Colluvium (Qc) Mountain valley alluvium (Qva) Younger piedmont-slope Alluvium (Qpy)
Paleozoic	Permian	All	250-280	Ingleside Formation (Pi) Fountain Formation (PPf)
	Carboniferous	Pennsylvanian	280-320	Fountain Formation (PPf)
		Mississippian	320-360	Not present in Project vicinity
	Devonian	All	360-410	Not present in Project vicinity
	Silurian	All	410-440	Not present in Project vicinity
	Cambrian	All	500-540	Not present in Project vicinity
Precambrian	Proterozoic	Neoproterozoic	540-1,000	Not present in Project vicinity
		Mesoproterozoic	1,000-1,600	Knotted mica schist and Granite of Longs Peak Batholith (undivided) (Xbq + YgLP) Quartzofeldspathic mica schist and pegmatite (Xbq + YXp) Granodiorite and pegmatite (Xgd + YXp) Granite of Longs Peak batholith (YgLP) Pegmatite (YXp)
		Paleoproterozoic	1,600-2,500	Biotite schist and gneiss (Xb) Knotted Mica Schist (Xbk) Knotted mica schist and Granite of Longs Peak Batholith (undivided) (Xbq + YgLP) Quartzofeldspathic mica schist (Xbq) Quartzofeldspathic mica schist and Trondhjemite of Thompson Canyon, undivided (Xbq + XjT) Quartzofeldspathic mica schist and pegmatite (Xbq + YXp) Granodiorite (Xgd) Granodiorite and pegmatite (Xgd + YXp) Hornblende gneiss and amphibolite (Xh) Trondhjemite of Thompson Canyon (XjT) Pegmatite (YXp)

[1] Ma = Million years ago.

3.3.2 Paleontology

The igneous rocks and metamorphic rocks that form bedrock in the area would not have preserved fossils and would be ranked as 1 (low potential for fossils under the Potential Fossil Yield Classification System (Bureau of Land Management 2007). In addition, these rocks may have preceded the presence of life on earth, precluding the potential presence of fossils. Exposures of these widespread igneous and metamorphic rocks would be expected to be devoid of fossils. Colluvium deposits (Qc), preserved in places within the area, have a nominally higher potential for fossil preservation (Potential Fossil Yield Classification rank 2).

The Fountain Formation is found in bedrock exposures at the southern end of Pinewood Reservoir and has the best potential of yielding fossils (Potential Fossil Yield Classification rank 3). Plant fossils from non-arkosic beds preserved in the Glen Eyrie Shale Member at the base of the Fountain Formation were originally noted by Finlay (1916, 1907). Jennings (1980) identified 15 species of tree-sized fern impressions found just above the Glen Eyrie Member at two localities just north of Canyon City on the western flank of the modern Rocky Mountain uplift. In addition, Ellis (1966) reported silicified Morrowan Age invertebrates from the Glen Eyrie Member weathering out of a 20-foot-thick calcareous interval 250 feet above the base of the Fountain Formation at Perry Park, about 35 miles south of Denver. The invertebrate fauna from this isolated Front Range locality includes bryozoans, brachiopods, crinoids, echinoids, and gastropods.

Only two Fountain Formation fossil localities have been identified in the foothill hogback belt to the east of the Project area. Toepelman and Rodeck (1936) described and named an amphibian fossil-footprint track-way found north of Denver in a Fountain Formation quarry on Flagstaff Mountain west of Boulder, Colorado.

3.3.3 Mineral Resources

In the Rolling Uplands, pegmatites have been explored for gem quality minerals and rare earths. In addition, the metamorphic rock terrains may contain high-quality mica crystals.

3.3.4 Geologic Hazards

Geologic hazards that could affect the area include landslides, floods, earthquakes and abandoned mines. The most likely hazards in the Project area are mass movements on steep slopes that would be triggered by heavy precipitation (melting snow or rainfall) that saturates and lubricates unconsolidated materials. The potential for landslides is widespread in the Project area based on hazard maps available from the Colorado Geological Survey (2012) (**Figures 3.3-2a** through **3.3-2d**). Flash flooding may be a hazard in narrow canyons. These areas are limited in the Project area.

There are no known faults underlying the area that show Quaternary movement (U.S. Geological Survey [USGS] and Colorado Geological Survey 2006). The USGS seismic hazard map (Petersen 2008) indicates that ground movement in the Project area that could be triggered by a maximum credible earthquake is expected to be low; having a peak ground acceleration of less than 10 percent of the acceleration of gravity with a 10 percent probability of exceeding that peak ground acceleration in 50 years. No abandoned mine workings have been identified on National Forest System lands in the Project area (Sares 1993).

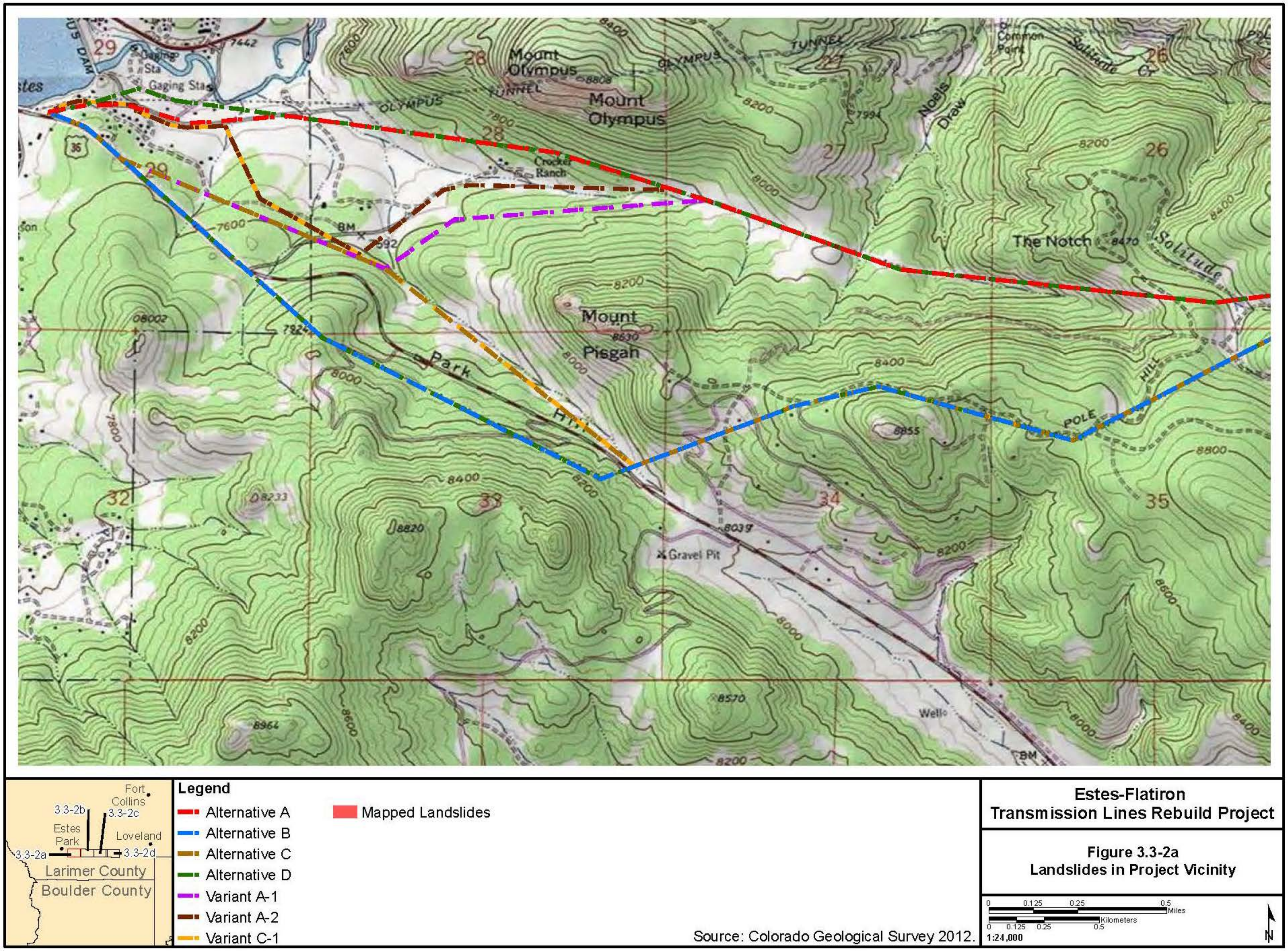


Figure 3.3-2a
Landslides in Project Vicinity

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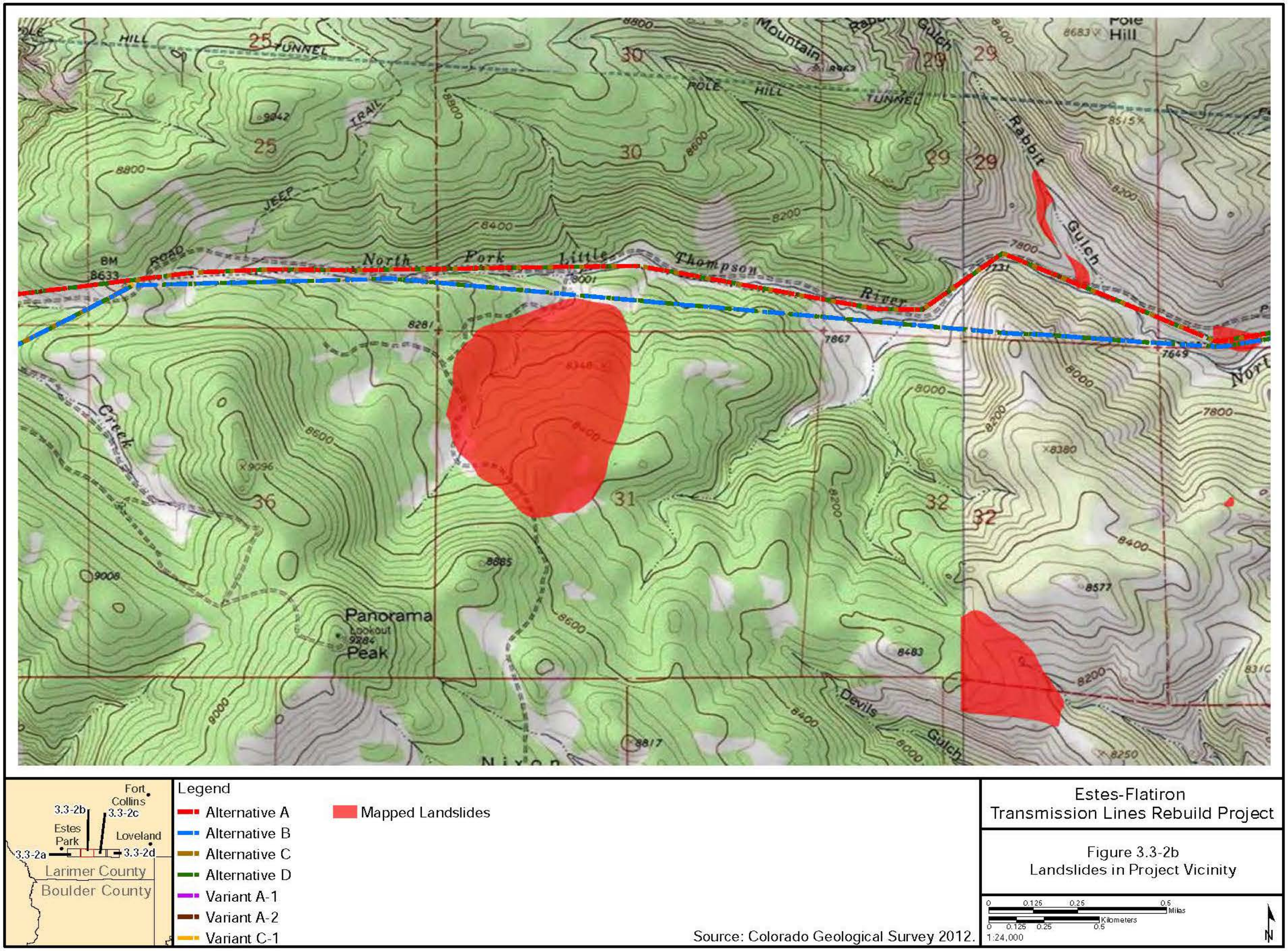


Figure 3.3-2b
Landslides in Project Vicinity

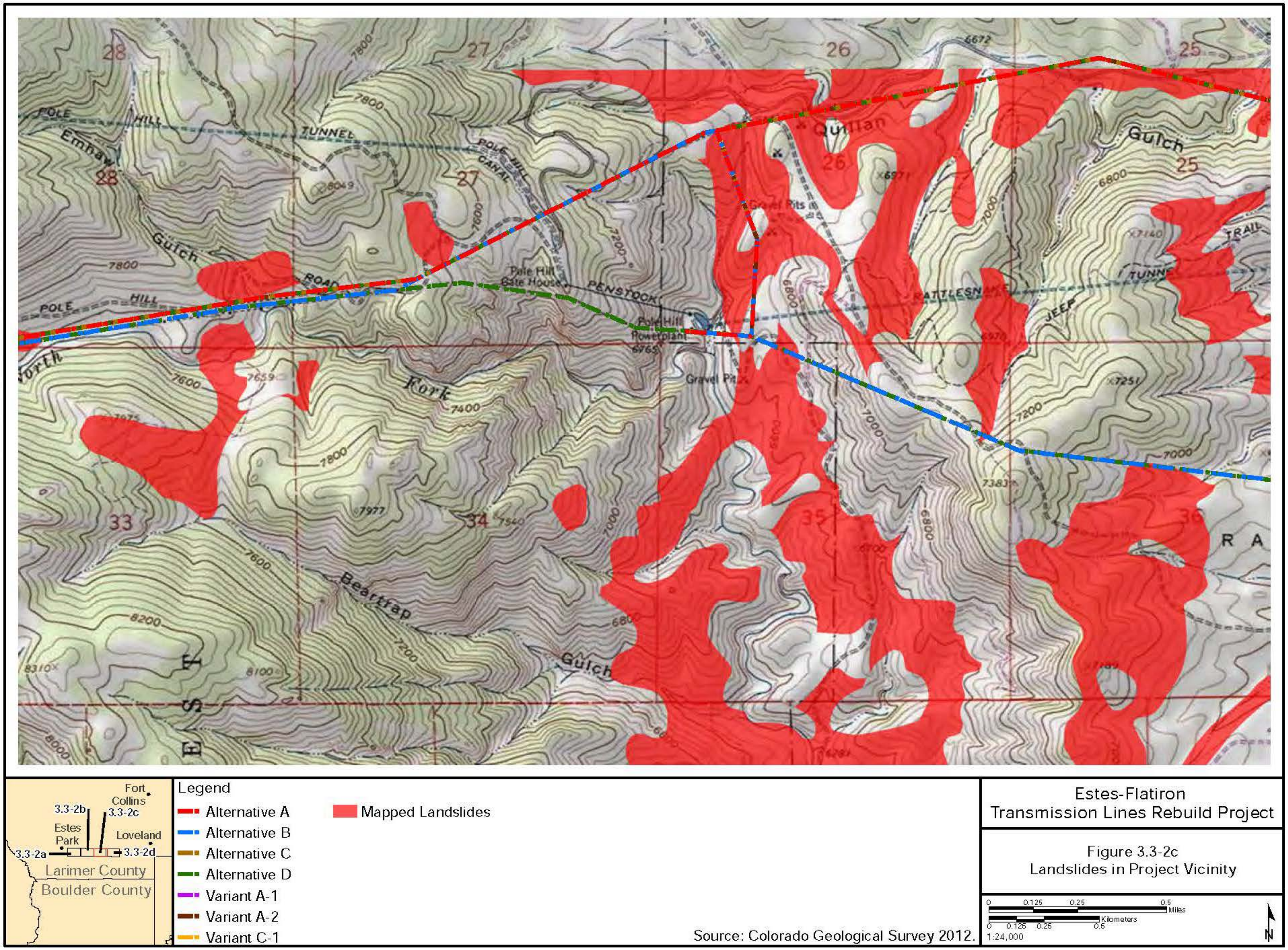
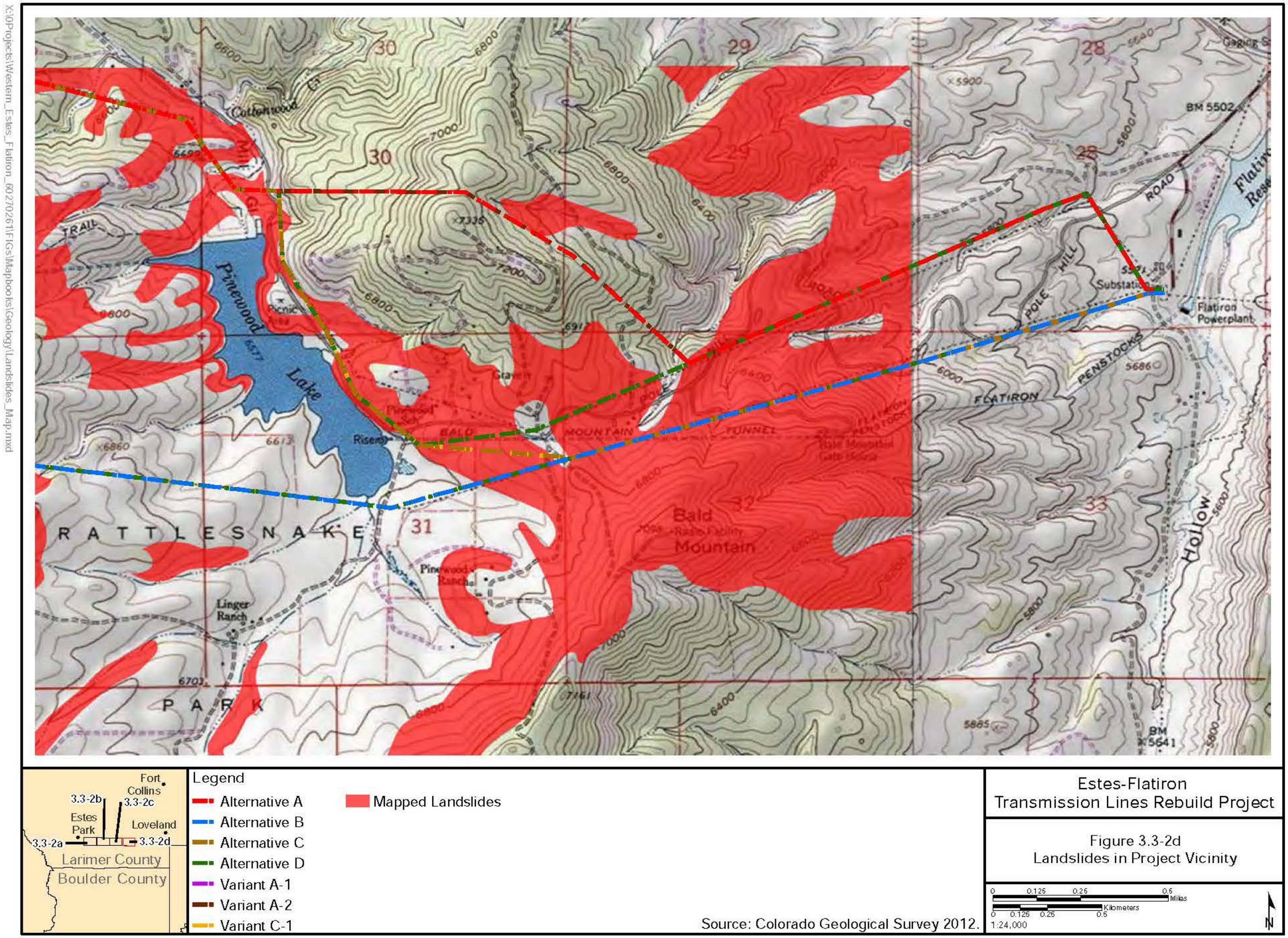


Figure 3.3-2c
Landslides in Project Vicinity


X:\0Projects\Western_Estes_Flatiron_60270261\FIGs\Mapbooks\Geology\Landslides_Map.mxd
Fort Collins
3.3-2b
3.3-2c
Estes Park
Loveland
3.3-2a
3.3-2d
Larimer County
Boulder County
Legend
Alternative A
Alternative B
Alternative C
Alternative D
Variant A-1
Variant A-2
Variant C-1
Mapped Landslides
Source: Colorado Geological Survey 2012.
Estes-Flatiron Transmission Lines Rebuild Project
Figure 3.3-2d
Landslides in Project Vicinity
1:24,000
Miles
Kilometers
Pinewood Lake
Bald Mountain
Rattlesnake Park
Flatiron Powerplant
Substation
Linger Ranch
Pinewood Ranch
Penstocks
Pole Hill Road

3.4 Soils

Information regarding soil characteristics was obtained from United States Department of Agriculture-Natural Resources Conservation Service (USDA-NRCS) literature or databases, including the Land Resource Regions and Major Land Resource Areas of the U.S., the Caribbean, and the Pacific Basin, U.S. Department of Agriculture (USDA) Handbook 296 (USDA-NRCS 2006) and the Soil Survey Geographic Database. Soil baseline characterization for the Project area is based on Soil Survey Geographic Database review and analyses. The Soil Survey Geographic Database is the most detailed level of soil mapping completed by the USDA-NRCS. The Soil Survey Geographic Database for Larimer County and the Roosevelt National Forest, Colorado (USDA-NRCS 2012a) are the source for the soils data in this section. **Table 3.4-1** provides a summary of the soil characteristics within the Project vicinity generated from the Soil Survey Geographic Database (USDA-NRCS 2012a). The various soil map units within the Project vicinity were combined into generalized groups of soils to evaluate potential impacts and to determine effective erosion control measures, reclamation, and revegetation potential in the area.

3.4.1 Regional Overview

The Project area is located entirely within Major Land Resource Areas 48A, the Southern Rocky Mountains Province of the Rocky Mountain System (USDA-NRCS 2006). This Major Land Resource Area consists primarily of two belts of strongly sloping to precipitous mountain ranges trending north to south. Several basins, or parks, are between the belts. Elevation ranges from 6,500 to 14,400 feet amsl. Many of the highest mountain ranges were reshaped by glaciation. Alluvial fans at the base of the mountains are recharge zones for local basin and valley fill aquifers.

The soils in Major Land Resource Area 48A primarily formed in slope alluvium and colluvium on mountain slopes or residuum on mountain peaks derived from igneous, metamorphic, and sedimentary parent materials. Younger igneous parent materials, primarily basalt and andesitic lava flows, tuffs, breccias, and conglomerates, are located throughout this area. The dominant soil orders in this Major Land Resource Areas are Mollisols, Alfisols, Inceptisols, and Entisols. Mollisols are fertile soils with high organic matter and a nutrient-enriched, thick surface. Alfisols generally are well developed soils that show extensive profile development, with distinct argillic (clay) accumulations in the subsoil. Alfisols have at least 35 percent base saturation, meaning calcium, magnesium, and potassium are relatively abundant. In contrast, Inceptisols are weakly developed soils that have altered horizons that have lost bases or iron and aluminum but retain some weatherable minerals. Entisols are considered recent soils that lack soil development because erosion or deposition rates occur faster than the rate of soil development.

3.4.2 Project Vicinity Soil Characteristics

Soil characteristics such as susceptibility to erosion and the potential for revegetation are important to consider when planning for construction activities and stabilization of disturbed areas. These limitations are a function of the soils physical and chemical properties as affected by climate and vegetation changes. **Table 3.4-1** summarizes the properties that establish the rate of soil susceptibility due to surface disturbing activities. Explanations of the meanings of each column follow the table.

Water erosion is the detachment and movement of soil by water. Natural erosion rates depend on inherent soil properties, slope, soil cover, and climate. Approximately 11 miles of the soils crossed by the existing transmission lines are highly erodible to water. Wind erosion is the physical wearing of the earth’s surface by wind. Wind erosion removes and redistributes soil. Wind erodible soils are not common within the Project vicinity. Highly erodible soils typically require aggressive erosion control measures to minimize soil loss and offsite deposition if they are disturbed.

Table 3.4-1 Soil Characteristics within the Project Vicinity (miles crossed by existing lines)

Map Unit Symbol	Map Unit Name	Miles Crossed	Wind Erodible	Water Erodible	LRP	Compaction Prone	Shallow Bedrock	Droughty	Risk of Corrosion to Steel
112	Trag-Moen complex, 5 to 30 percent slopes	9	0	0	0	4	4	0	0
117	Wetmore-Boyle-Rock outcrop complex, 5 to 60 percent slopes	4	0	1	0	0	1	0	0
30	Elbeth-Moen loams, 5 to 30 percent slopes	4	0	2	0	3	1	0	0
58	Kirtley-Purner complex, 5 to 20 percent slopes	2	0	0	0	0	0	0	2
85	Purner fine sandy loam, 1 to 9 percent slopes	1	0	0	0	0	0	0	1
87	Ratake-Rock outcrop complex, 25 to 55 percent slopes	8	0	2	0	0	2	0	0
2101B	Pachic Argiustolls, 5 to 25 percent slopes	2	0	0	0	0	0	0	0
2703B	Cypher-Ratake families complex, 5 to 40 percent slopes	1	0	0	0	0	7	0	0
2705D	Ratake-Cathedral families-Rock outcrop complex, 40 to 150 percent slopes	2	0	1	<1	0	<1	0	0
2706D	Cypher family-Rock outcrop complex, 40 to 150 percent slopes	1	0	1	0	0	1	0	0
2717B	Cypher-Wetmore-Ratake families complex, 5 to 40 percent slopes	5	0	0	1	0	3	0	0
4703D	Bullwark-Catamount families-Rock outcrop complex, 40 to 150 percent slopes	4	0	4	3	0	4	1	0
4704B	Bullwark-Catamount families-Rubble land complex, 5 to 40 percent slopes	1	0	0	1	0	1	<1	0
5101A	Pachic Argiustolls-Aquic Argiudolls complex, 0 to 15 percent slopes	1	0	0	0	3	0	0	3

Note: Discrepancies in total number of miles crossed may exist. Data represents all alternatives.

LRP = limited revegetation potential.

Source: USDA-NRCS 2012a.

Soil compaction occurs when soil particles are pressed together and the pore spaces between them are reduced and bulk density is increased. Moist, fine textured soils are most susceptible to severe compaction. Compaction-prone soils are often high in clay content, which can be a limiting factor to vegetation growth. Approximately 10 miles of the soils crossed by the existing line ROW are compaction prone.

Soils with limited revegetation potential have chemical characteristics such as high salts, sodium, or very high or low pH that may limit plant growth. Saline soils affect plant uptake of water and sodic soils often have drainage limitations. In addition, the success of stabilization and restoration efforts in these areas may be limited unless additional treatments and practices are employed to offset the adverse physical and chemical characteristics of the soils. Approximately 5.9 miles of the soils crossed have low revegetation potential, and where disturbed, revegetation may be difficult. However, it is likely that not all 5.9 miles would be disturbed by construction of the transmission line. Many of these areas may be spanned.

In areas with a shallow depth to lithic bedrock (relative to the tower foundation excavation depth), excavation may result in rock fragments remaining on the surface at levels that will limit the success of restoration efforts. Where the proposed routes cross soils with lithic bedrock, specialized drilling equipment may be required for tower foundations. Approximately 24 miles of soils crossed have lithic bedrock less than 60 inches in depth.

Corrosion potential pertains to potential soil-induced electrochemical or chemical action that corrodes or weakens uncoated steel or concrete. The rate of corrosion of uncoated steel is related to such factors as soil moisture, particle-size distribution, acidity, and electrical conductivity of the soil. The rate of corrosion of concrete is based mainly on the sulfate and sodium content, texture, moisture content, and acidity of the soil. Special site examination and design may be needed if the combination of factors results in a severe hazard of corrosion. For uncoated steel, the risk of corrosion is based on soil drainage class, total acidity, electrical resistivity near field capacity, and electrical conductivity of the saturation extract. For concrete, the risk of corrosion is based on soil texture, acidity, and amount of sulfates in the saturation extract (USDA-NRCS 2012a). No soils that are corrosive to concrete are found within the Project vicinity. Approximately 6 miles of soils crossed are corrosive to uncoated steel.

Soils that are droughty have physical characteristics that may limit plant growth due to low water holding capacity. In addition, the success of stabilization and restoration efforts in these areas may be limited unless additional treatments and practices are employed to offset the adverse physical characteristics of the soils. Approximately 1 mile of the soils crossed is considered droughty.

Hydric soils are soils that formed under conditions of saturation, flooding, or ponding long enough during the growing season to develop anaerobic conditions in the upper part that is hydric. These soils are commonly associated with floodplains, lake plains, basin plains, riparian areas, wetlands, springs, and seeps. Based on the soil survey mapping, no hydric soils are crossed by the Project; however, small areas of hydric soils may not be documented due to the scale of mapping. Alteration of hydric, saturated, or hummocky soils should be avoided.

Prime farmland is land that has the best combination of physical and chemical characteristics for producing crops and is available for these uses. These soils have the capability to be prime farmland, even if they have not yet been developed for agricultural uses. The Farmland Protection Policy Act states that Federal programs that contribute to the unnecessary and irreversible conversion of farmland to non-agricultural uses will be minimized and shall be administered in a manner that, as practicable, are compatible with state and local government and private programs and policies to protect farmland. No prime farmland is within the Project area (USDA-NRCS 2012a).

3.5 Water Resources and Floodplains

Federal regulations that ensure the protection of water resources include the Safe Drinking Water Act and the CWA. The Safe Drinking Water Act protects drinking water resources and requires strategies to prevent pollution. The CWA regulates pollutant discharge into streams, rivers and wetlands. The USEPA has established primary and secondary standards to guarantee quality drinking water. The CDPHE implements the standards set by the USEPA and regulates the discharge of pollutants into surface and ground water and enforces the Primary Drinking Water Regulations.

Section 402 of the CWA authorizes discharges of storm water under the NPDES. The State of Colorado is delegated the NPDES program under the CWA and has adopted their own state Pollutant Discharge Elimination System programs. Western would prepare a Storm Water Pollution Prevention Plan as part of the Project. This Plan would include stabilization practices, structural practices, storm water management, and other controls.

Floodplains are land areas adjacent to rivers and streams that are subject to recurring flooding. Floodplains typically help moderate flood flow, recharge groundwater, spread silt to replenish soils, and provide habitat for a number of plant and animal species. EO 11988, Floodplain Management, requires Federal agencies to ensure their actions minimize the impacts of floods on human health and safety, and restore the natural and beneficial values of floodplains. DOE regulations in 10 CFR parts 1021 and 1022 require public notification of floodplain involvement (DOE 2003). Western sent a notification of proposed floodplain action for the proposed alternatives to affected landowners, FEMA, and other agencies with its NOI that was distributed as part of the EIS scoping.

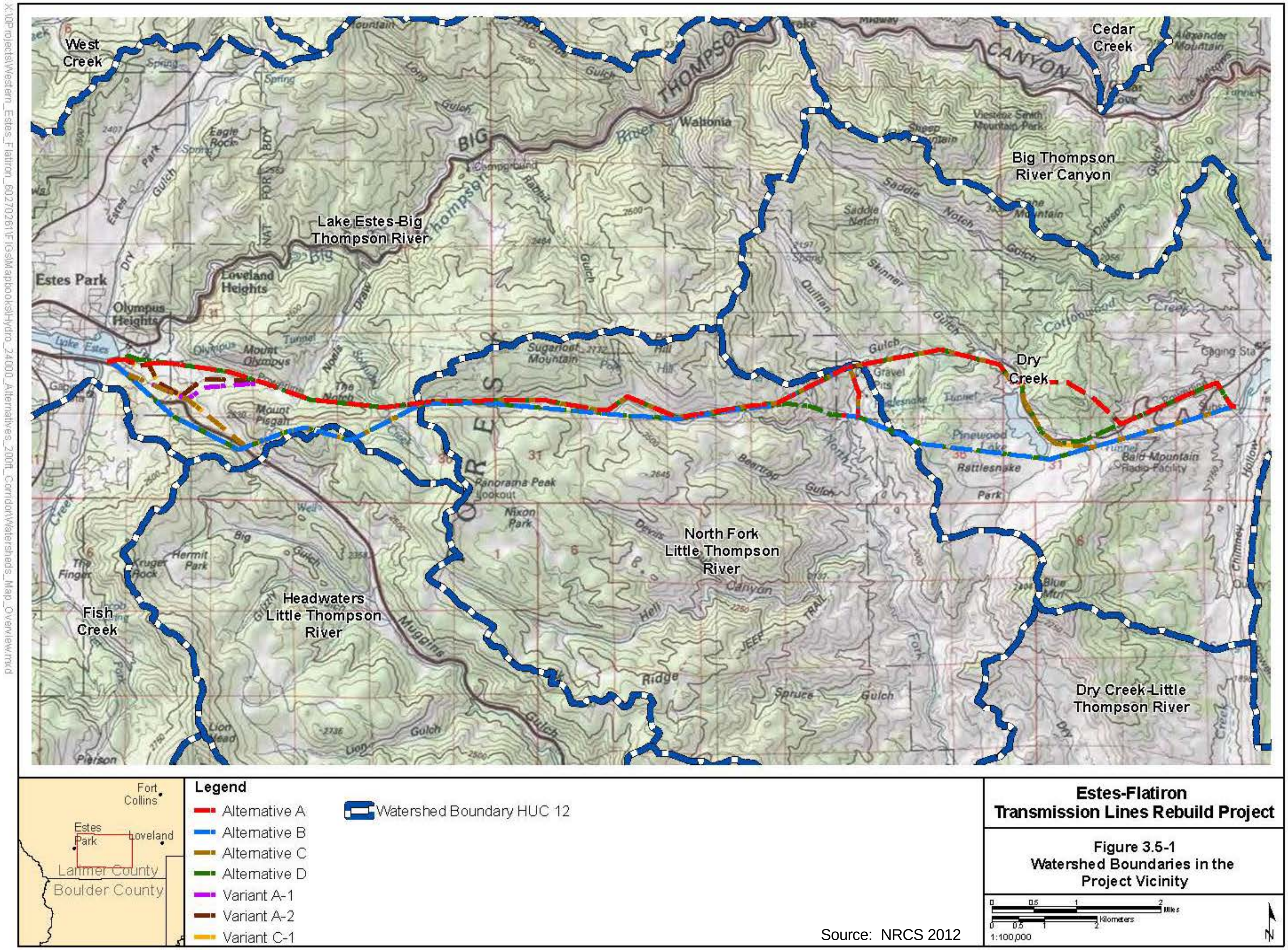
3.5.1 Surface Water

The Project area is located within the Big Thompson River watershed in Larimer County, Colorado and includes streams and floodplains crossed by the existing transmission lines, the proposed alternatives, and access roads. Watersheds in the U.S. were delineated by the USGS using a national standard hierarchical system based on surface hydrologic features. Each hydrologic unit is identified by a unique hydrologic unit code (HUC) consisting of 2 to 12 digits. There are four 12-digit HUC watersheds located on or near the proposed alternatives (USDA-NRCS 2012b):

- Lake Estes/Big Thompson (101900060207);
- Headwaters Little Thompson River (101900060402);
- North Fork Little Thompson River (101900060403); and
- Dry Creek (101900060602).

These watershed boundaries are shown on **Figure 3.5-1.**

Water quality classifications and standards adopted by the Colorado Water Quality Control Commission implement the Water Quality Control Act in Colorado. Water quality in streams along the existing transmission lines is classified by the CDPHE for current or reasonably expected uses, and uses for which the waters would become more suitable when a water quality goal is attained (CDPHE 2012a). All existing and classified uses are to be protected. The classifications are to be for the highest water quality attainable through the use of effluent limitations for point sources and implementation of cost-effective and reasonable best management practices for non-point sources (CDPHE 2012a).Western's SCPs (similar to best management practices) are presented in Section 2.5, Standard Construction Practices.


West Creek
Cedar Creek
Big Thompson River Canyon
Lake Estes-Big Thompson River
Estes Park
Olympus Heights
Loveland Heights
Dry Creek
North Fork Little Thompson River
Headwaters Little Thompson River
Fish Creek
Dry Creek-Little Thompson River
Fort Collins
Estes Park
Loveland
Larimer County
Boulder County
Legend
Alternative A
Alternative B
Alternative C
Alternative D
Variant A-1
Variant A-2
Variant C-1
Watershed Boundary HUC 12
Source: NRCS 2012
Estes-Flatiron Transmission Lines Rebuild Project
Figure 3.5-1
Watershed Boundaries in the Project Vicinity
Miles
Kilometers
1:100,000
N

Section 303(d) of the Federal CWA requires that states list waters that do not fully support existing or designated uses and require development of a Total Maximum Daily Load. Colorado's Monitoring and Evaluation List identifies water bodies where there is reason to suspect water quality problems, but where there is uncertainty regarding one or more factors, such as the representative nature of the data. Also placed on the Monitoring and Evaluation List are water bodies that are impaired but it is unclear whether the cause of impairment is attributable to specific pollutants or general pollution. This list is a state-only document that is not subject to USEPA approval (CDPHE 2012b). **Table 3.5-1** shows the stream reaches within the Project area that are currently on the state of Colorado's 303(d) impaired water list (CDPHE 2012a).

Field reconnaissance was conducted in July and September, 2011. A comprehensive drainage and wetland crossing table was developed that shows all drainages and canals that are spanned by the existing transmission lines or crossed by existing access roads. **Table 3.5-2** shows the number of stream crossings for the alternatives. Approximately 30 small culverts are located along the existing transmission lines.

The North Fork Little Thompson River is the only perennial stream spanned by transmission lines or crossed by access roads within the Project area. The remaining 53 ephemeral or intermittent stream crossings span several tributaries to the Big Thompson River, North Fork Noels Draw, South Fork Noels Draw, Solitude Creek, Quillan Gulch, Mill Gulch, Emhaw Gulch, and unnamed tributaries to these drainages, as well as tributaries to Pinewood Reservoir and Flatiron Reservoir. The ephemeral channels typically flow only during snow melt or local precipitation events, and the intermittent streams only flow seasonally.

Existing access roads, which include those not built by Western for ROW purposes, cross drainages approximately 37 times. Approximately 30 of these crossings have culvert(s) crossings.

3.5.2 Floodplains, Wild and Scenic Rivers

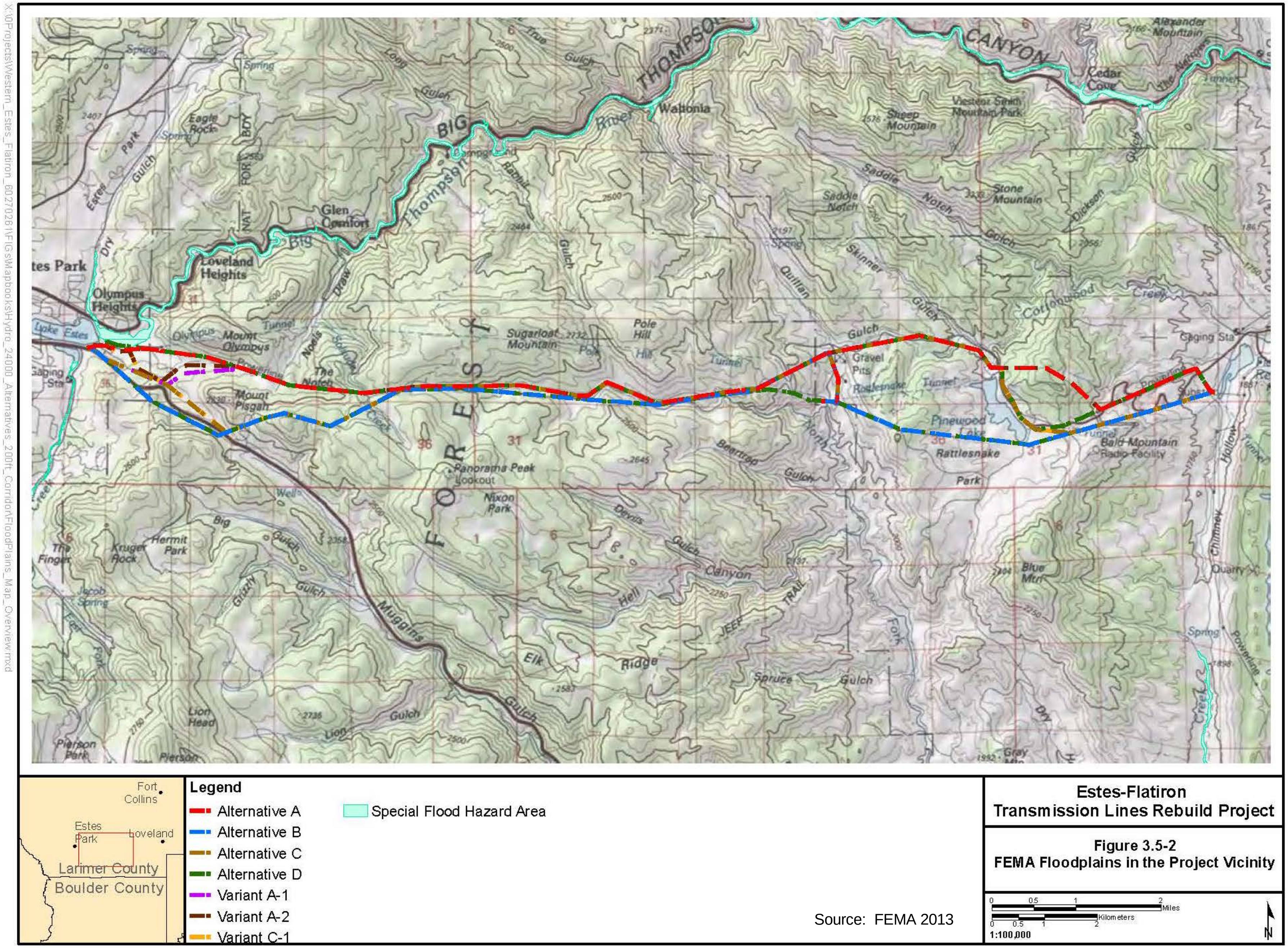
FEMA Flood Insurance Rate Maps are available for the entire Project area. These maps, published in December 2006, show Special Flood Hazard Areas (SFHAs), also known as floodplains, which are subject to inundation from a 100-year flood event. The North Line transmission line runs along the Big Thompson River SFHA. Several wood H-frame structures are located within the delineated floodplain. The existing transmission line spans the SFHA for approximately 550 feet. Mall Road, U.S. Highway 36 and U.S. Highway 34 are roads that cross the SFHA of the Big Thompson River (see **Figure 3.5-2**).

The remainder of the North Line and South Lines and associated access roads in the Project area are not located in SFHAs. The proposed reroute sections on the South Line and North Line segments are not located in SFHAs.

No Wild and Scenic rivers occur along the alternative alignments or along any of the existing transmission lines. The Big Thompson River was studied for inclusion in the National Wild and Scenic Rivers System in the late 1970s. Designation was not recommended to Congress at that time (National Wild and Scenic Rivers System 2013).

3.5.3 Groundwater

In addition to the surface water resources previously discussed, the Safe Drinking Water Act also applies to groundwater resources.



Estes-Flatiron Transmission Lines Rebuild Project

Figure 3.5-2
FEMA Floodplains in the Project Vicinity

Table 3.5-1 Colorado Designated Beneficial Uses for Streams, 303(d) List and Colorado's Monitoring and Evaluation Parameters for the Project Area

Hydrologic Unit Code Watershed (HUC-12)	Stream Segment	Beneficial Use Classifications	CWA 303(d) List of Impaired Waters (CDPHE 2012a)	Colorado's Monitoring and Evaluation Parameters
Lake Estes/ Big Thompson	Big Thompson River Segment 2	Aquatic Life Cold 1 Recreation E Water Supply Agriculture	Copper, Cadmium, Zinc, Temperature	Sulfide
Headwaters Little Thompson River	Big Thompson River Segment 8	Aquatic Life Cold 1 Recreation E Water Supply Agriculture	Temperature, Dissolved Oxygen	None
North Fork Little Thompson River	Big Thompson River Segment 8	Aquatic Life Cold 1 Recreation E Water Supply Agriculture	None	None
Dry Creek	Big Thompson River Segment 6	Aquatic Life Warm 2 Recreation E Agriculture (Use Protected)	Copper	E. coli

Beneficial use classifications have the following definitions:

Aquatic Life Cold 1: These are waters that: 1) currently are capable of sustaining a wide variety of cold water biota, including sensitive species; or 2) could sustain such biota but for correctable water quality conditions. Waters shall be considered capable of sustaining such biota where physical habitat, water flows or levels, and water quality conditions result in no substantial impairment of the abundance and diversity of species.

Aquatic Life Warm 2: These are waters that are not capable of sustaining a wide variety of cold or warm water biota, including sensitive species, due to physical habitat, water flows or levels, or uncorrectable water quality conditions that result in substantial impairment of the abundance and diversity of species.

Recreation E: These surface waters are used for primary contact recreation or have been used for such activities since November 28, 1975.

Water Supply: These surface waters are suitable or intended to become suitable for potable water supplies. After receiving standard treatment (defined as coagulation, flocculation, sedimentation, filtration, and disinfection with chlorine or its equivalent) these waters will meet Colorado drinking water regulations and any revisions, amendments, or supplements thereto.

Agriculture: These surface waters are suitable or intended to become suitable for irrigation of crops usually grown in Colorado and which are not hazardous as drinking water for livestock.

Use Protected: These are waters that the Commission has determined do not warrant the special protection provided by the outstanding waters designation or the anti-degradation review process (CDPHE 2012a).

Table 3.5-2 Summary of Drainage Crossings

Transmission Line Alternatives	Number of Perennial Stream Crossings	Number of Intermittent Stream Crossings	Number of Ephemeral Stream Crossings	Number of Canal Crossings	Total Number of Stream Crossings
Alternative A	4	27	11	1	43
Variant A1	4	26	10	1	41
Variant A2	4	26	10	1	41
Alternative B	1	21	26	1	49
Alternative C	4	24	18	1	47
Variant C1	4	24	18	1	47
Alternative D	5	37	37	1	80

Source: USGS-National Hydrography Dataset (NHD) 2017.

In the Project area, much of the drinking water used for household supply consists of groundwater pumped from individual wells. For example, approximately 150 water wells have been permitted and/or constructed in the Ravencrest area (Section 34, Township 5 North [T5N], Range 72 West [R72W]). Roughly 75 to 100 wells occur elsewhere near the proposed alternatives (Colorado Division of Water Resources [CDWR] 2013). These individual wells generally are concentrated at the east and west ends of the Project area. Correspondingly, numerous individual sanitation systems (septic tanks and filter fields) also occur within the Project area.

In the mountains on the western half of the Project area, depths to groundwater recorded in well logs range from approximately 50 to over 650 feet below the ground surface (CDWR 2013). In the eastern portion of the Project area, depths range from approximately 100 to over 300 feet below the ground surface (CDWR 2013). On gentler topography nearer to Pinewood Lake, depths to groundwater vary from approximately 20 to 80 feet below the ground surface (CDWR 2013). Depths to groundwater rapidly increase to the east toward Flatiron Reservoir. Groundwater levels are likely to be nearer the ground surface along toe slopes and low topography along canyons and streams. In addition, depths to water generally are shallowest after snowmelt in the spring and early summer.

3.6 Wetlands and Waters of the U.S.

The following section presents the affected environment for wetlands, waters of the U.S., and riparian areas within the Project vicinity.

Riparian and wetland areas comprise a small percentage of the lands in the Western U.S., but their importance to the surrounding ecosystems and associated species is disproportionately great. Most wildlife species use riparian areas at some point in their life cycles (e.g., many migratory birds during breeding and migration seasons), and some depend almost entirely on these systems (e.g., amphibians). Wetlands and riparian areas are often rich in vegetation diversity and structure, providing food, water, shade, and cover to wildlife and livestock, in addition to acting as water purifiers, supplying groundwater recharge, and aiding in flood control. Applicable Laws and Regulations

Waters of the U.S. are defined in 33 CFR Part 328, Section 3 as all non-tidal waters that are currently, or were used in the past, or may be susceptible to use in interstate commerce; all interstate waters including wetlands; all other waters such as interstate lakes, rivers, streams (including intermittent streams), mud flats, sand flats, wetlands, sloughs, prairie potholes, wet meadows, playa lakes, or natural ponds, of which the use, degradation, or destruction could affect interstate commerce; and all impoundments of waters otherwise defined as waters of the U.S. under this definition. In addition, tributaries of the above listed waters, including arroyos and other intermittent drainages, and wetlands adjacent to the above waters also are considered to be waters of the U.S.

Criteria used by the USACE to determine whether a drainage constitutes a waters of the U.S. include presence of a defined bed, banks, or evidence of an OHWM. Wetlands adjacent to other waters of the U.S., such as streams, also are considered to be waters of the U.S. In addition, and as used herein, the term "wetlands" has a regulatory definition as defined in 33 CFR 328.7(b) as "those areas that are 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." Note that the frequency and duration of saturation may vary by geographical region, and is largely dependent upon local climatic conditions.

According to the USACE's 1987 Wetland Delineation Manual, a "three-parameter" approach is required for delineating USACE-defined wetlands (USACE 1987), where areas are identified as wetlands if they exhibit hydrophytic vegetation, hydric soils, and wetland hydrology.

3.6.1 Affected Environment

Within the Project vicinity, in 2011, Western conducted field surveys for wetlands and potential waters of the U.S. within a 110-foot ROW centered along the existing transmission lines and access roads. Field surveys consisted of a reconnaissance level sample point approach based on guidelines developed by the USACE. A total of 66 sample points were selected and evaluated representing the majority of these features. Survey results for wetlands are discussed in the text below. SWReGAP data were used to identify wetlands in the Project vicinity that were not part of the surveyed areas. Descriptions of the wetlands identified using SWReGAP and acres in the Project vicinity are presented in Section 3.7, Vegetation.

Drainages identified during field surveys within the 110-foot ROW included one perennial stream and multiple ephemeral channels. Even though field surveys focused on the 110-foot ROW along the existing transmission lines, field survey results for drainages are sufficient to cover the majority of the Project vicinity. According to the field surveys, these stream crossings are all potentially waters of the U.S. **Table 3.6-1** describes the survey results, including the drainage name, flow frequency, its potential jurisdictional status, if an existing access road crosses a waters of the U.S. or wetland, and a description of the drainage or wetland crossing.

3.6.1.1 Wetlands

Wetlands are located adjacent and abutting the North Fork Little Thompson River and within 22 drainage features in the Project vicinity. Wetlands along the North Fork Little Thompson River include lowland meadows, wet meadow/drainage complexes, and river terraces. Widths of associated vegetated wetlands ranged from 4.5 to 30 plus feet with lesser widths most common. Vegetation communities established along the river are highly variable with dense herbaceous understories common. Highly developed shrub and tree community components are most notable where the river channel is incised or confined with moderately steep to steeply sloping banks. These wetlands occur across nearly level to less than 5 percent slopes and vary in size from an approximate width of 15 feet to greater than 30 feet. Soils were typically saturated to the surface or near surface. These wetlands support a diverse, productive, herbaceous understory of hydric species with occasional stands of trees and shrubs. Some portions of two of the wetlands appeared to be potential fens or near potential fens (Sample Point E65 – **Figure 3.6-1b**).

Wetlands within the ephemeral drainage features in the Project vicinity are found at nearly level to less than 10 percent slopes in the study area and support diverse plant communities. The more narrow drainages and swales typically support communities of grass, grass-likes (sedges, rushes, etc.), forbs, shrubs, and tree species. The broader drainages and swales are characterized by plant communities more herbaceous in nature exhibiting a variety of grass, grass-like, and forb species.

Lowland meadows, depressions, and similar topographic elements support 12 wetlands. These wetlands have formed across nearly level topographies to slopes of less than 10 percent. Soils overlying these wetlands are typically saturated to the surface or near surface. Several of the wetlands exhibited hydrologic features including watercourses, drainages, seeps, or springs. Four of these wetlands are considered to be "isolated" while the remainder are tributary to waters of the U.S. The wetlands at sample points E11, E22, E32, E35, and E49 exhibit the essential surficial characteristics of, and are considered to be, potential fens (**Figure 3.6-1a** through **Figure 3.6-1d**). These wetlands are typically highly productive and have comparatively diverse vegetation, although they typically lack a shrub or tree component to any extent. **Figure 3.6-1a** through **3.6-1d** show the field wetland sample points, field-identified drainages, and SWReGAP wetlands crossed by the Project alternatives.

3.6.1.2 Waters of the U.S.

Waters of the U.S. in the Project vicinity include the North Fork Little Thompson River, its tributaries and ephemeral upland drainages that drain into North Big Thompson River, North Fork Noels Draw, South Fork Noels Draw, Solitude Creek, Quillan Gulch, Mill Gulch, Emhaw Gulch, Pinewood Reservoir, and Flatiron Reservoir.

The only perennial stream in the study area is the North Fork Little Thompson River. The river itself was flowing at the time of the field surveys (Cedar Creek Associates 2014). Channel slopes for the river are typically less than 5 percent and are stable. Defined beds and banks are the norm with channel widths at the OHWM typically ranging from 3.0 to 5.0 feet wide. Four upland ephemeral drainages are tributary to the North Fork Little Thompson River. Their channel widths ranged from 2.0 to 4.0 feet. Slopes ranged from 5 to 10 percent. These drainages were typically stable, though bank cutting was observed in one area. Vegetation communities along these drainages were dominated by upland-classed plant species. These ephemeral drainages were not flowing at the time of the survey (Cedar Creek Associates 2014).

Sixteen upland drainages that drain into North Fork Little Thompson River were identified in the Project vicinity during field surveys (Cedar Creek Associates 2014). They include North Fork Noels Draw, South Fork Noels Draw, Solitude Creek, Quillan Gulch, Mill Gulch, Emhaw Gulch, Pinewood Reservoir and Flatiron Reservoir, and others. Fifteen of these drainages were classed as ephemeral while one, a concrete feature known as the Pole Hill Canal, is perennial. Three of the ephemeral drainages evaluated were flowing at the time of the field surveys (**Table 3.6-1**). The ephemeral upland drainages are typically characterized by the lack of a defined bed and bank and a channel width ranging from 2.0 to 8.0 feet, though wider drainages up to 15 or 20 feet were observed. Slopes ranged from less than 5 percent to approximately 40 percent overall. Vegetation communities paralleling these channels typically have an upland herbaceous understory with a variable shrub component and are relatively diverse (Cedar Creek Associates 2014).

Table 3.6-1 Drainage and Wetland Crossings in the Project Vicinity[1]

Sample Points (see Figure 3-5)	Drainage Name	Perennial/ Ephemeral	Potential Waters of the U.S.	Wetland	Existing Road Crosses Drainage with Waters of the U.S. or Wetlands?	Description	Applicable Alternatives
E34	Tributary to Big Thompson	Ephemeral	Y	N	Y	Width channel 6 feet. No wetland. Vegetation: Upland mix, *Pentaphyloides floribunda.*	A,D
E35	Tributary to Big Thompson	Ephemeral	Y	Y	Y	Width OHWM 1 foot. Flowing; wetland mapped. Potential fen. Vegetation: *Juncus balticus*, *Carex aquatilis, Carex nebrascensis.*	A,D
E40	North Fork Noels Draw	Ephemeral	Y	Y	Yes, but no defined channel at road crossing. Only swale.	Width OHWM 2.5 feet. Vegetation: *Alnus incana*, *Betula occidentalis*, *Equisetum arvensis, Calamagrostis inexpansa.*	A, A1, A2, D
E41	Tributary to South Fork Noels Draw	Ephemeral	Y	Y	Y	Width OHWM 2 feet. Flowing intermittent sections. Wetland width 6 to 20 feet. Vegetation: *Lonicera involucrata, Calamagrostis inexpansa, Mertensia ciliata, Carex aquatilis.*	A,A1, A2,D
E48	Solitude Creek	Ephemeral	Y	Y	OHWM 1 foot. Wetlands width 3 - 4 feet.	Width OHWM 1 foot. Flowing. Wetland width 6.5 feet at line crossing. Wetland mapped. Vegetation: *Juncus balticus, Carex utriculata, Mertensia ciliate.*	A, A1, A2,D
E63	Tributary to North Fork Little Thompson	Ephemeral	Y	N	Y	Drainage channel width 4 feet. Vegetation: Upland vegetation.	A, A1, A2,C,C1, D
E62	Tributary to North Fork Little Thompson	Ephemeral	Y	N	Y	Upland drainage. Drainage width 4 feet. Vegetation: Upland vegetation.	A, A1, A2,C,C1,D
E51	North Fork Little Thompson	Perennial	Y	Y	N	Width OHWM 3 feet. Width wetlands 20 feet. Vegetation: *Alopercurus pratensis, Alnus incana* subspp*. Tenuifolia, Carex nebrascensis.*	A, A1, A2,C,C1, D
E51	Tributary to North Fork Little Thompson	Ephemeral	Y	Y	Y	Width OHWM 3 feet. Width wetlands 20 feet. Vegetation: *Alopercurus pratensis, Alnus incana* subspp*. Tenuifolia, Carex nebrascensis.*	A, A1, A2,C,C1,D
E54	Rabbit Gulch	Ephemeral	Y	N	Yes, West County Road 18E, culvert under road.	Drainage width 2 feet. Vegetation: Upland mix.	A, A1, A2,C,C1,D

Table 3.6-1 Drainage and Wetland Crossings in the Project Vicinity[1]

Sample Points (see Figure 3-5)	Drainage Name	Perennial/ Ephemeral	Potential Waters of the U.S.	Wetland	Existing Road Crosses Drainage with Waters of the U.S. or Wetlands?	Description	Applicable Alternatives
E55	North Fork Little Thompson	Perennial/ Intermittent	Y	Y	Y	Width of OHWM 5 feet. Wetland width 9 to 10 feet. Vegetation: *Carex aquatilis, Carex utriculata, Alopercurus pratensis, Epilobium cilatum* ssp. *Glandulosum.*	A, A1, A2,C,C1,D
E25	Emhaw Gulch	Ephemeral	Y	Y	West County Road 18E, culvert under road.	Width of OHWM 4 to 7 feet. Wetland width 8 feet wide (when present) Vegetation: *Mertensia ciliata, Acer glabrum, Jamesia americana, Salix* spp.	A, A1, A2,B,C, C1,D
E24	Tributary to North Fork Little Thompson	Ephemeral	Y	Y	West County Road 18E, culvert under road.	Channel width 4 feet. Vegetation: Upland mix.	A, A1, A2,B,C,C1,D
E28	Polehill Penstock	Open Canal	Y	N	Y	Concrete canal vegetation.	A, A1, A2, B,C,C1,D
E15	Quillan Gulch	Ephemeral	Y	Y	West County Road 18E, culvert under road.	Width of OHWM 2 to 4 feet. Wetland width mapped. Vegetation: *Salix exigua, Juncus balticus.*	A, A1, A2,C,C1,D
E14	Tributary to Quillan Gulch	Ephemeral	Y	Y	West County Road 18E, culvert under road.	No bed and bank. All vegetated. Drainage width between 3 and 12 feet. Wetlands width between 3 and 12 feet. Vegetation: *Calamagrostis inexpansa, Carex microptera, Carex aquatilis.*	A, A1, A2,C, C1,D
E9	Tributary to Pinewood Lake	Ephemeral	Y	N	Pole Hill Road has culvert at this crossing.	No bed and bank. Vegetation: *Bromopsis inermis.*	C,D
E8	Tributary to Flatiron Reservoir	Ephemeral	Y	Y	Pole Hill Road has culvert at this crossing.	Width of OHWM 3 feet. Total width of vegetated wetlands 2 to 8 feet. Slight flow in channel. Vegetation: *Salix exigua, Toxicodendron rydbergii, Poa* spp.	A,D
NSP	Tributary to Big Thompson	Ephemeral	Y	N	Culvert under U.S. Highway 36.	No bed and bank. Culvert empties to open area. No sample point taken. Vegetation: Upland mix.	None
E45	Tributary to Big Thompson	Ephemeral	Y	N	Culvert under U.S. Highway 36.	No bed and bank. Drainage width 4 to 6 feet. No flow. Vegetation: Upland mix.	B,D
E47	Tributary to Big Thompson	Ephemeral	Y	Y	Culvert under U.S. Highway 36.	No bed and bank. No flow, wet. Wetland mapped. Vegetation: *Alopercurus pratensis.*	B,C,C1,D

Table 3.6-1 Drainage and Wetland Crossings in the Project Vicinity[1]

Sample Points (see Figure 3-5)	Drainage Name	Perennial/ Ephemeral	Potential Waters of the U.S.	Wetland	Existing Road Crosses Drainage with Waters of the U.S. or Wetlands?	Description	Applicable Alternatives
E2	North Fork Little Thompson	Perennial	Y	Y	Y	Width OHWM 2.5 feet. Wetland width 9 feet. Vegetation: *Alnus incana* subspp. Tenuifolia, *Equisetum arvensis, Carex* spp.	B,C,D
E25	Emhaw Gulch	Ephemeral	Y	Y	W County Road 18E, culvert under road. (same culvert as 8-6 - 8-7 on E-L Line).	Width of OHWM 4 to 7 feet. Wetland width 8 feet wide (when present) Vegetation: *Mertensia ciliata*, *Acer glabrum, Jamesia americana, Salix* spp.	A, A1, A2,B,C,C1,D
E24	Tributary to North Fork Little Thompson	Ephemeral	Y	N	W County Road 18E, culvert under road. (same culvert as 8-6 - 8-7 on E-L Line).	Channel width 4 feet. Vegetation: Upland mix.	A, A1, A2,B,C,C1,D
E1, E2	Tributary to Flatiron Reservoir	Ephemeral	N	N	N	Upland vegetated drainage. 10 feet wide, no defined bed and bank. Vegetation: Upland mix.	B,C,C1,D
E5	Tributary to Flatiron Reservoir	Ephemeral	Y	N	Pole Hill Road crosses drainage.	Width of OHWM is 2 feet. No wetland. Steep ephemeral drainage. Vegetation: Upland shrubs.	B,C,C1,D
NSP	Tributary to Flatiron Reservoir	Ephemeral	Y	N	Pole Hill Road crosses drainage.	Vegetation: Upland shrubs.	D
E7	Tributary to Flatiron Reservoir	Ephemeral	Y	N	Road crosses drainage.	Drainage 3 feet wide. Vegetation: Upland shrubs.	B,C,C1,D
E6	Tributary to Flatiron Reservoir	Ephemeral	Y	N	Road crosses drainage.	Drainage 1 to 3 feet. Vegetation: Upland shrubs.	B,C,C1, D
E20	Tributary to Pinewood Lake. Access road crossing only.	Ephemeral	Y	Y	Access road crosses drainage at high spot.	No bed and bank. No channel at crossing. Swale width 12 to 24 feet. Vegetation: High spot across swale (no wetland). Wetlands on upstream and downstream side. Mapped for avoidance.	B, D

Table 3.6-1 Drainage and Wetland Crossings in the Project Vicinity[1]

Sample Points (see Figure 3-5)	Drainage Name	Perennial/ Ephemeral	Potential Waters of the U.S.	Wetland	Existing Road Crosses Drainage with Waters of the U.S. or Wetlands?	Description	Applicable Alternatives
E21	Tributary to Chickenhouse Gulch	Ephemeral	Y	N	Curve on access road at this point. Unstable bank on upstream side. May need access road work in this location.	No bed and bank. Channel width 6 feet. Vegetation: Upland vegetation.	A, A1, A2, B, C, C1
NSP	North Fork Little Thompson River	Ephemeral	Y	Y	Access road to BOR facility.	Channel width 2 to 3 feet. Wetland width 6 feet. Access road locked - no sample point. Vegetation: *Calamagrostis inexpansa, Thermopsis montanus, Carex* spp.	None
E43	Tributary to Big Thompson	Ephemeral	Y	Y	Y	No defined bed and bank. Further south flow concentrates, wet but not flowing. Vegetation: *Juncus balticus, Carex* spp.	A2, C
E44	Tributary to Big Thompson	Ephemeral	Y	N	Y	Channel width 4 to 6 feet. Vegetation: Upland mix.	B, C, D

[1] Not all wetland sample points are included in the drainage table. Only those with additional attribute information related to waters of the U.S. provided by Cedar Creek are listed in the table.

OHWM = ordinary high water mark.

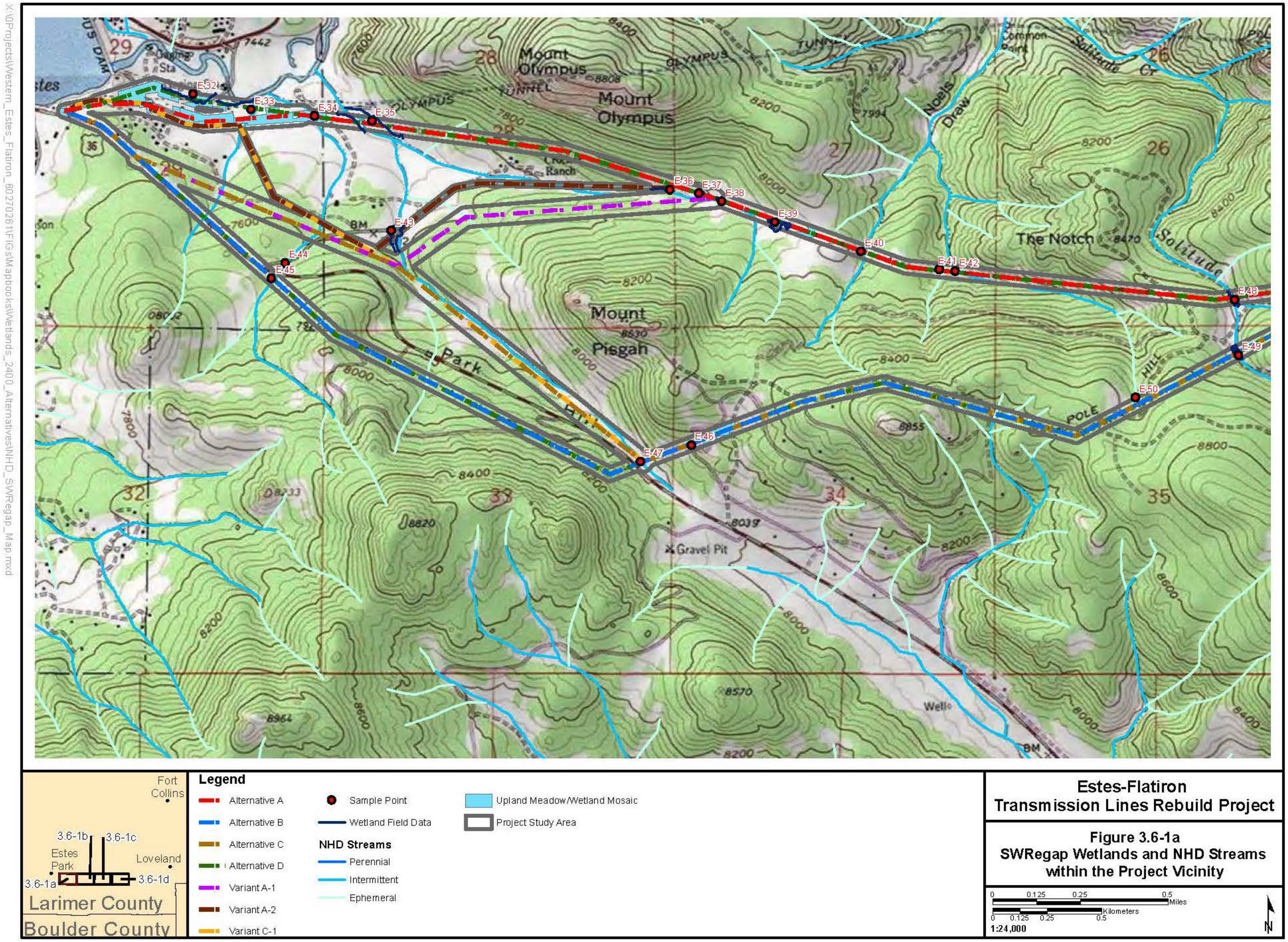


Figure 3.6-1a
SWRegap Wetlands and NHD Streams within the Project Vicinity

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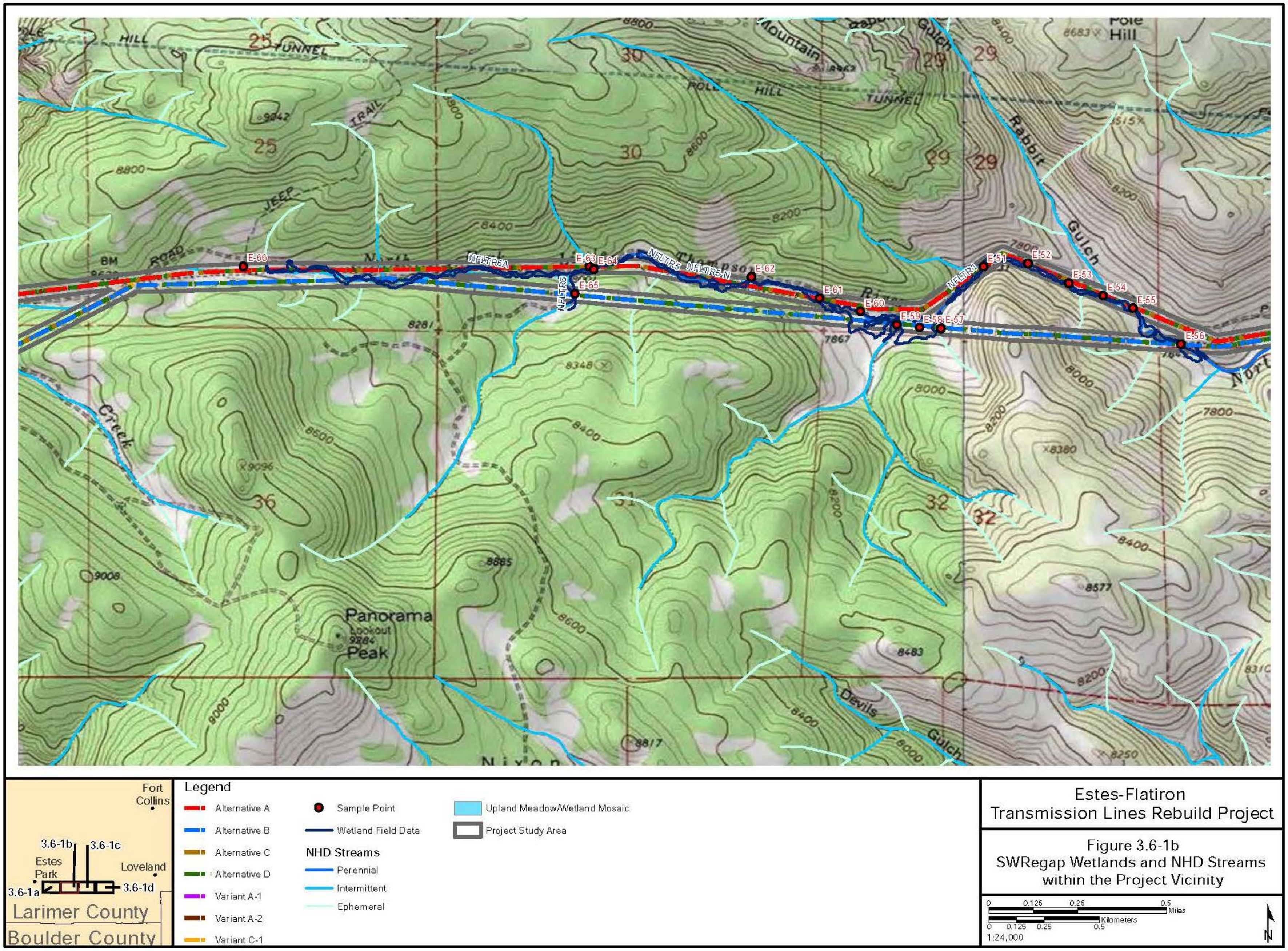
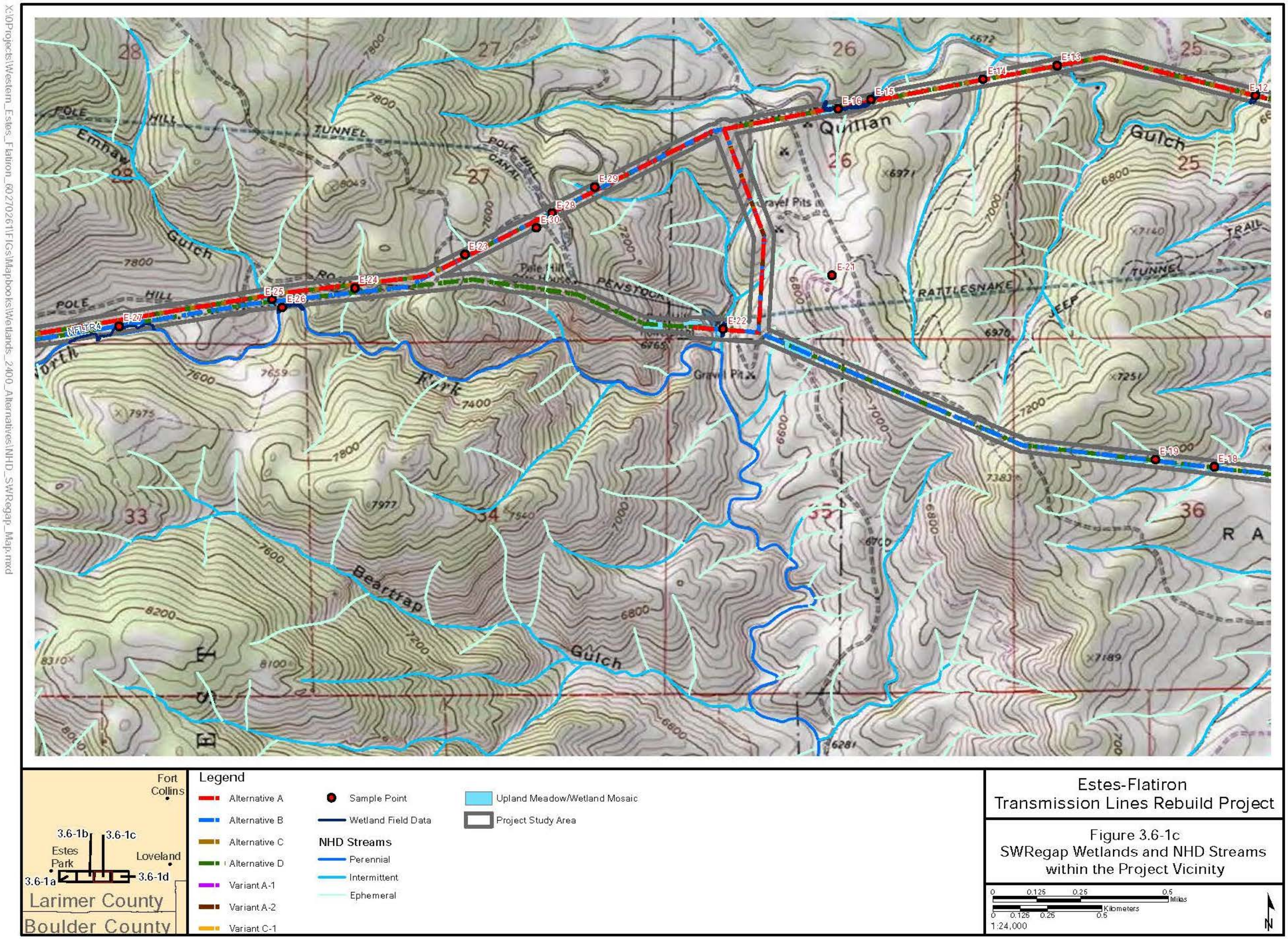


Figure 3.6-1b
SWRegap Wetlands and NHD Streams within the Project Vicinity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Fort Collins
3.6-1b
3.6-1c
Estes Park
Loveland
3.6-1a
3.6-1d
Larimer County
Boulder County
Legend
Alternative A
Alternative B
Alternative C
Alternative D
Variant A-1
Variant A-2
Variant C-1
Sample Point
Wetland Field Data
NHD Streams
Perennial
Intermittent
Ephemeral
Upland Meadow/Wetland Mosaic
Project Study Area
Estes-Flatiron
Transmission Lines Rebuild Project
Figure 3.6-1c
SWRegap Wetlands and NHD Streams
within the Project Vicinity
0 0.125 0.25 0.5 Miles
0 0.125 0.25 0.5 Kilometers
1:24,000
N

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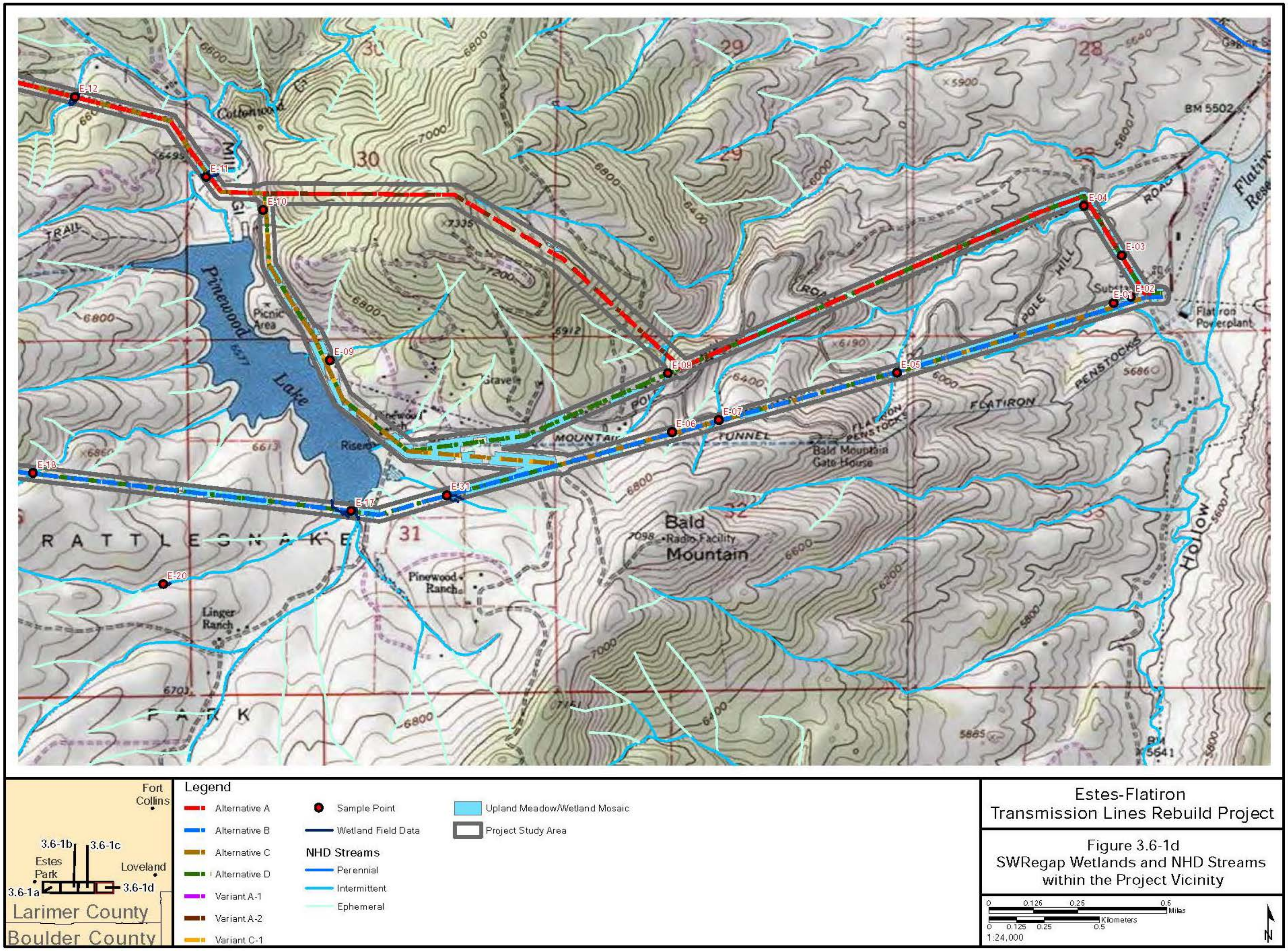


3.7 Vegetation

The Project vicinity for vegetation resources, including general vegetation, noxious weeds and invasive species, wetlands, and special status plant species resources includes a width of 200 feet for existing transmission lines centered on the ROWs for each alternative, 300 feet for new routing options, and 75 feet for underground variants. Potential impacts to vegetation would be limited to these areas. The following section presents the affected environment for general vegetation resources, noxious weeds and invasive species, wetlands, and special status plant species within the Project vicinity.

3.7.1 General Vegetation

The Project vicinity is predominantly located in the Crystalline Mid-Elevation Forests USEPA Level IV ecoregion, with the eastern portion of the line in the Foothill Shrublands ecoregion. Vegetation communities within the Project vicinity were surveyed in 2011 (Cedar Creek Associates 2014). Observations recorded during initial field evaluation of the Project vicinity included vegetation communities and dominant vegetation associated with each vegetation community. The field-identified vegetation communities were incorporated with the available SWReGAP data to create a vegetation layer that characterizes the Project vicinity.

The Project vicinity is characterized as mountainous, with ponderosa pine dominant throughout the Project area, which is considered an aspect-dependent dry continental forest. There is an increasing amount of dead woody vegetation (fuel) from mountain pine beetle infestation. See Section 3.7.3, Fuels and Fire Management, for more detail on wildfire and fuel loads in the Project vicinity. There are five vegetation communities within the Project vicinity including ponderosa pine woodland, mountain shrub, mixed conifer forest, and upland meadow. Intermixed within the vegetation communities are areas of rock outcrops. **Table 3.7-1** provides a summary of the acreages for each vegetation cover type within the Project vicinity. Wetland communities are included in this table but discussed in greater detail in Section 3.6. **Figures 3.7-1a** through **3.7-1d** illustrates the vegetation cover types present within the Project vicinity.

Table 3.7-1 Vegetation Communities in the Project Vicinity

Vegetation Communities	Acres	% of Project Vicinity
Ponderosa pine woodland	508	58
Mountain shrub mosaic	124	14
Mixed conifer forest	93	11
Upland meadow/wetland mosaic	99	11
Upland meadow	48	5
Total	872	100

Descriptions of the plant communities for each vegetation cover type are provided below. Community characterizations were compiled based on the field survey vegetation community descriptions (Cedar Creek Associates 2014). Species nomenclature is consistent with the NRCS Plants Database (USDA-NRCS 2013).

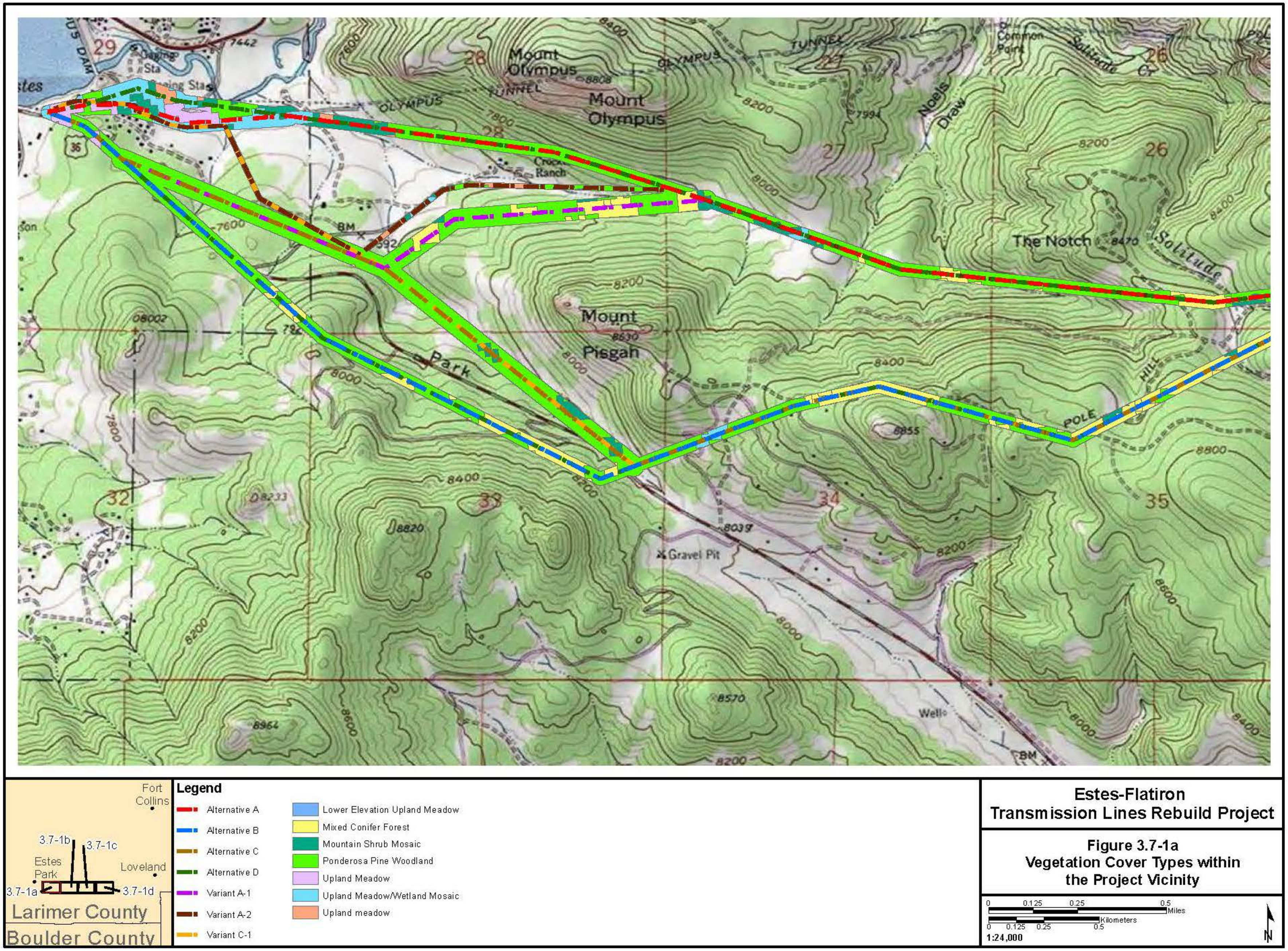
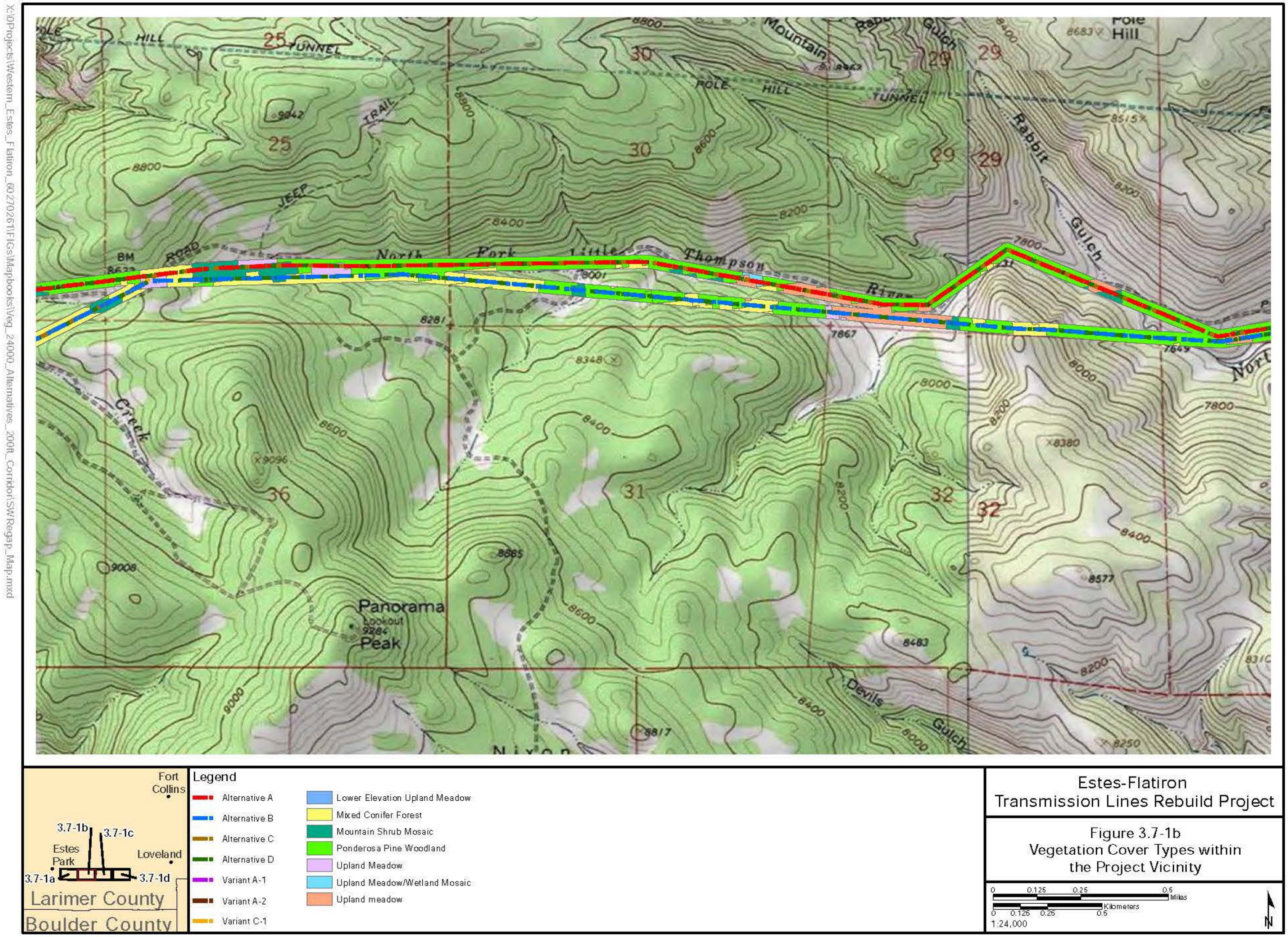


Figure 3.7-1a
Vegetation Cover Types within the Project Vicinity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North Fork Little Thompson River
Rabbit Gulch
Pole Hill
Pole Hill Tunnel
Jeep Road
Trail
Creek
Panorama Peak
Lookout
Devils Gulch
Fort Collins
Estes Park
Loveland
3.7-1a
3.7-1b
3.7-1c
3.7-1d
Larimer County
Boulder County
Legend
Alternative A
Alternative B
Alternative C
Alternative D
Variant A-1
Variant A-2
Variant C-1
Lower Elevation Upland Meadow
Mixed Conifer Forest
Mountain Shrub Mosaic
Ponderosa Pine Woodland
Upland Meadow
Upland Meadow/Wetland Mosaic
Upland meadow
Estes-Flatiron
Transmission Lines Rebuild Project
Figure 3.7-1b
Vegetation Cover Types within
the Project Vicinity
0 0.125 0.25 0.5 Miles
0 0.125 0.25 0.5 Kilometers
1:24,000
N

X:\0Projects\Western_Estes_Flatiron_60270261\FIGs\Mapbooks\Veg_24000_Alternatives_200ft_Corridor\SWRegap_Map.mxd

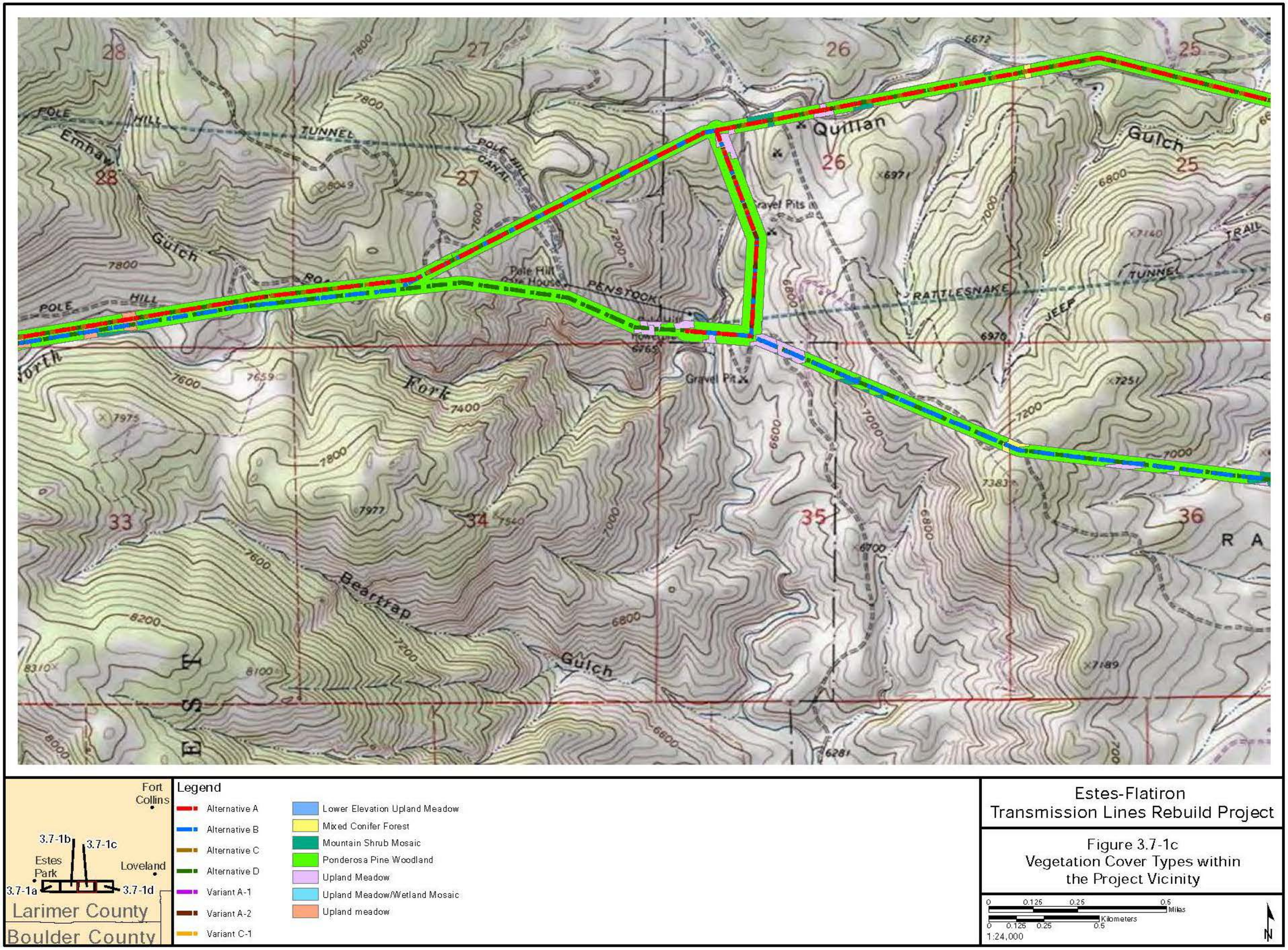
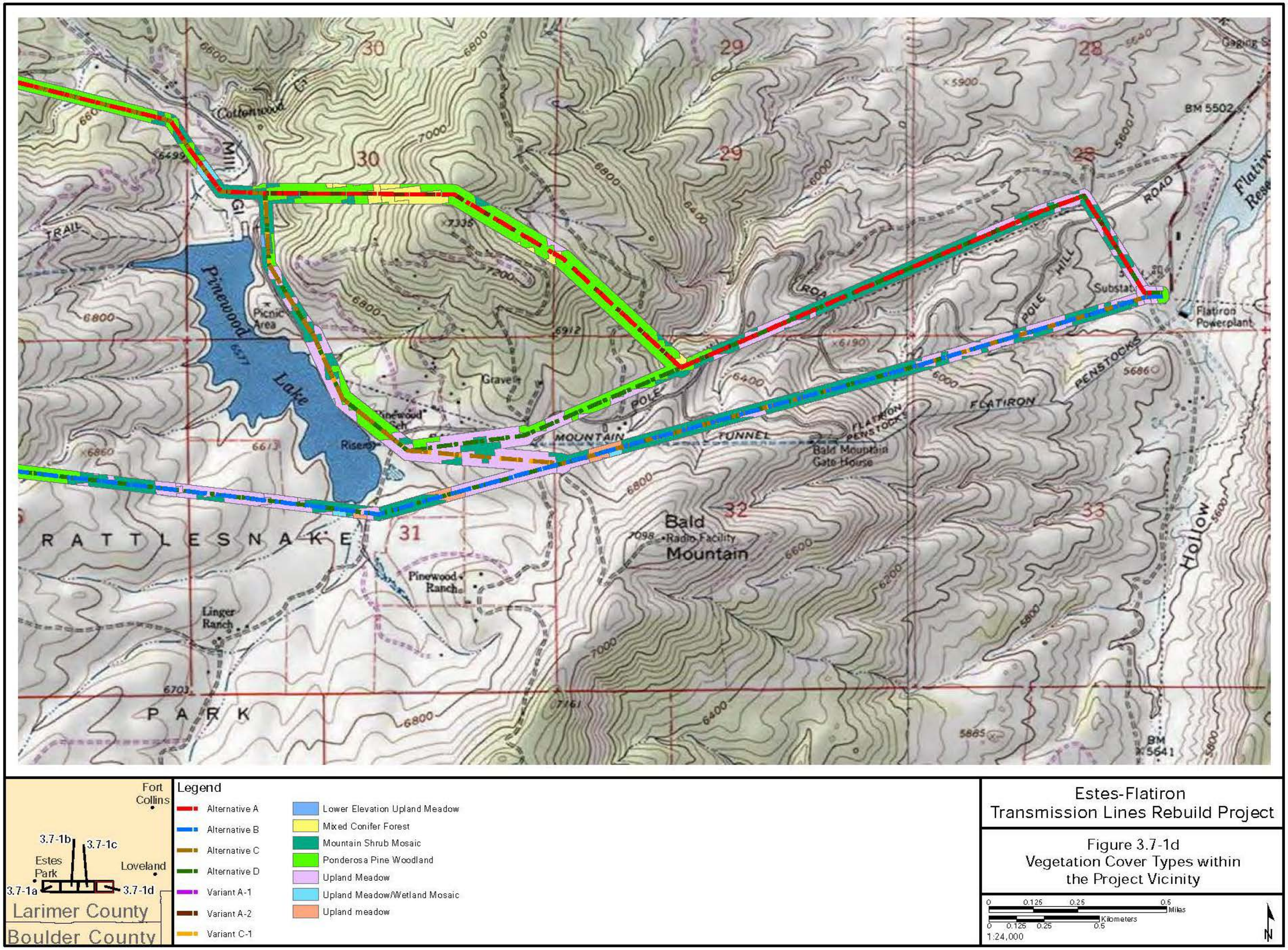


Figure 3.7-1c
Vegetation Cover Types within
the Project Vicinity



Estes-Flatiron Transmission Lines Rebuild Project

Figure 3.7-1d
Vegetation Cover Types within the Project Vicinity

3.7.1.1 Ponderosa Pine Woodland

Ponderosa pine woodlands are the dominant vegetation community within the Project vicinity covering 57 percent of the Project vicinity. These communities are found throughout the entire Project vicinity. The dominant overstory species in this community is ponderosa pine (*Pinus ponderosa*). Understory species consist of shrubs and herbaceous species with dominant species including mountain ninebark (*Physocarpus monogynus*), alderleaf mountain mahogany (*Cercocarpus montanus*), antelope bitterbrush (*Purshia tridentate*), common juniper (*Juniperus communis*), smooth brome (*Bromopsis inermis*), Rocky Mountain fescue (*Festuca saximontanus*), pine dropseed (*Blepharoneuron tricholepis*), silvery lupine (*Lupinus argenteus*), mountain goldenbanner (*Thermopsis Montana*), hairy false goldenaster (*Heterotheca villosa*), and Mt. Albert goldenrod (*Solidago simplex*) (Cedar Creek Associates 2014).

3.7.1.2 Mountain Shrub Mosaic

Often in association with the Ponderosa Pine woodland vegetation community, the mountain shrub mosaic is scattered throughout the Project vicinity. It covers 15 percent of the Project vicinity. Dominant vegetation are shrubs, including alderleaf mountain mahogany, fivepetal cliffbush (*Jamesia Americana*), common juniper, chokecherry (*Padus virginiana*), kinnikinnick (*Arctostaphylos uva-ursi*), and Woods' rose (*Rosa woodsii*). Dominant trees include ponderosa pine, and Douglas-fir (*Pseudotsuga menziesii*), with limited cover. The dominant herbaceous species in this vegetation community is smooth brome (Cedar Creek Associates 2014).

3.7.1.3 Mixed Conifer Forest

The mixed conifer forest (11 percent of the Project vicinity) is found predominantly in the southern portions of the Project vicinity. The canopy cover varies in this vegetation community, with some areas having a more open canopy. Dominant species are coniferous species including Ponderosa pine, Douglas-fir, lodgepole pine (*Pinus contorta*), and limber pine (*Pinus flexilis*). Ponderosa pine and Douglas-fir are more dominant in the areas with the open canopy cover. In the areas with a closed canopy, the understory includes common juniper, fivepetal cliffbush, and kinnikinnick. Open canopy understory species include Geyer's sedge (*Carex geyeri*), Rocky Mountain fescue, common juniper, kinnikinnick, and mountain ninebark (Cedar Creek Associates 2014).

3.7.1.4 Upland Meadow/Wetland Mosaic

The upland meadow/wetland mosaic is found in association with the upland meadow at the eastern and western ends of the Project vicinity. It covers 11 percent of the Project vicinity. Dominant vegetation in this vegetation community includes a mix of upland and wetland species (Cedar Creek Associates 2014). Upland species include grass species such as bluegrass species (*Poa* sp.), smooth brome, Rocky Mountain fescue, needle-and-thread (*Hesperostipa comate*), blue grama (*Bouteloua gracilis*), prairie Junegrass (*Koeleria macrantha*), cheatgrass (*Bromus tectorum*), and forbs including small-leaf pussytoes (*Antennaria parviflora*), prairie sagewort (*Artemisia frigida*), hairy false goldenaster, silverleaf Indian breadroot (*Pediomelum argophyllum*), purple prairie clover (*Dalea purpurea*), silvery lupine, white sagebrush (*Artemisia ludoviciana*), sulphur-flower buckwheat (*Eriogonum umbellatum*), western yarrow (*Achillea millefolium* var. *occidentalis*), Gunnison's mariposa lily (*Calochortus gunnisonii*), and biennial wormwood (*Artemisia biennis*).

Wetland species include meadow foxtail (*Alopecurus pratensis*), Nebraska sedge (*Carex nebrascensis*), thinleaf alder (*Alnus incana* ssp. *tenuifolia*), Northwest Territory sedge (*Carex utriculata*), narrowleaf willow (*Salix exigua*), wild mint (*Mentha arvensis*), mountain rush (*Juncus arcticus* ssp. *littoralis*), and swordleaf rush (*Juncus ensifolius*). Drainages are located in this vegetation community in the eastern portion of the Project vicinity. Within these drainages, dominant shrubs include chokecherry, skunkbush sumac (*Rhus trilobata*), and American plum (*Prunus americana*) (Cedar Creek Associates 2014).

3.7.1.5 Upland Meadow

The upland meadow community comprises 6 percent of the Project vicinity, and is found at the eastern and western ends of the Project vicinity in association with the upland meadow/meadow mosaic vegetation community. Herbaceous species are dominant and include smooth brome, Rocky Mountain fescue, pine dropseed, silvery lupine, mountain goldenbanner, hairy false goldenaster, Mt. Albert goldenrod. At lower elevations in the Project vicinity, there is increased diversity of herbaceous species in the upland meadow vegetation community including cheatgrass, needle-and-thread, sulphur-flower buckwheat, prairie sagewort, white sagebrush, blue grama, prairie Junegrass, Gunnison's mariposa lily, silverleaf Indian breadroot, and purple prairie clover. Geyer’s sedge and small-leaf pussytoes were observed in the higher elevation upland meadows. Tree and shrub species in this vegetation community include Ponderosa pine, mountain ninebark, alderleaf mountain mahogany, antelope bitterbrush, and common juniper (Cedar Creek Associates 2014).

3.7.2 Noxious Weeds

The Federal Plant Protection Act of 2000 (formerly the Noxious Weed Act of 1974) and EO 13112 of February 3, 1999, require cooperation with state, local, and other Federal agencies in the application and enforcement of all laws and regulations relating to the management and control of noxious weeds. Noxious weeds in Colorado are non-native plant species that have been designated by the Colorado Department of Agriculture (CDA) due to their invasiveness, aggressiveness, or the rate at which they spread and adversely affect desired native plants or agricultural crops and rangelands. The Colorado Noxious Weed Act (CDA 2012) states that noxious weed management is the responsibility of local governing agencies, including incorporated municipalities, counties, and state and Federal agencies. Western would be responsible for controlling all noxious weeds identified in the Colorado Noxious Weed Act whether present now or in the future along and within its ROW.

The CDA manages and regulates noxious and invasive species through the Colorado Noxious Weed Act, which classifies noxious weeds into three lists, A, B, and C (Colorado Revised Statutes [CRS] § 35 5.5-101 through 119, CRS [2003]). Each list has specific control requirements, with the most stringent requirements for those species found on List A. List A species are designated for eradication. List B includes species for which state noxious weed management plans would be developed to stop the continued spread of these species. List C includes species for which state noxious weed management plans would be developed to support the efforts of local governing bodies to facilitate more effective integrated weed management on private and public lands (CDA 2012). In addition, the Act states that each county in the state shall adopt a noxious weed management plan for all the unincorporated lands within the county. The Larimer County Noxious Weed Management Plan was approved by the Board of County Commissioners on March 6, 2008.

Field surveys for noxious weeds were conducted along the 2011 proposed alignment. State and county listed noxious weeds observed during the field survey were recorded by species, approximate size of weed patch, and location. New proposed and alternative routes added to the Project after the initial field surveys have not been surveyed for noxious weeds. Surveys would be conducted along the final route prior to Project implementation (see Section 2.5).

Three noxious weeds were observed during field surveys in a total of 49 noxious weed patches within the Project vicinity. All three noxious weed species identified in the analysis area are designated by Colorado and Larimer County as List B Species. The three species observed are Canada thistle (*Cirsium arvense*), musk thistle (*Carduus nutans*), and Dalmatian toadflax (*Linaria dalmatica*). The majority of the observed noxious weeds were found in drainage bottoms and edges, on wetland edges, or in disturbed areas near road edges. Canada thistle was the dominant weed recorded, being found in 45 of the 49 weed patches. Musk thistle was recorded in 10 weed patches, of which seven populations were found in combination with Canada thistle. Dalmatian toadflax was found at two locations, one in combination with Canada thistle and musk thistle. Locations of all weed patches documented by field surveys are on file with Western.

3.7.3 Fuels and Fire Management

Within each vegetative community type found in the Project vicinity, there is a characteristic fire regime. A fire regime is a general description of the role fire would play across a landscape in the absence of modern human mechanical intervention, but includes the influence of aboriginal burning (Interagency Fire Regime Condition Class Guidebook 2008). Historical fire regimes are classified based on average number of years between fires (fire frequency) combined with the severity (amount of replacement) of the fire on the dominant overstory vegetation. Generally, fire frequency is inversely related to fire intensity. For example, due to higher precipitation levels and cooler mean temperatures (which foster plant growth), there are higher fuel loads in pinyon-juniper woodlands and upper montane forest vegetation types as compared to lowland shrublands and grasslands. In addition, higher precipitation amounts and cooler temperatures provide greater resistance to fire for longer periods. This combination of factors leads to infrequent, high-intensity fires in montane and subalpine forests, for example. The reverse is true in grasslands where fine fuel types lead to fires at a high frequency that burn rapidly with low intensity. **Table 3.7-2** details historical fire regimes by alternative.

Other factors that determine fire behavior include site topography, weather and climatic conditions, time of year, type of plant community, health of the ecosystem, fuel moisture levels, depth and duration of heat penetration, fire frequency and site productivity. The highest potential rates of fire spread occur in areas with flashy fuels such as cured-out annual bromes, and steep brushy mountain slopes (County of San Diego 2013; National Park Service 2013a; San Diego State University 2004).

Table 3.7-2 Acres of Fire Regime Classification by Alternative

Fire Regime	Alternative A	Variant A1	Variant A2	Alternative B	Alternative C	Variant C1	Alternative D
200+ years; Stand Replacement	17.4	12.0	3.5	11.0	10.0	3.5	18.5
35-100+ years; Mixed Severity	25.8	15.7	5.9	4.2	10.5	5.6	19.6
35-100+ years; Mixed Severity	53.6	53.6	47.3	50.3	50.4	45.7	101.1
0-35 years; Low Severity	280.8	300.2	266.5	267.3	278.2	277.2	473.7

Source: Landfire 2010.

Wildland fire risk tends to be high in disturbed grasslands and forblands dominated by non-native noxious and invasive species, especially those dominated by annual brome species, as well as areas affected by mountain pine beetle kill.

Fire Regime Condition Class (FRCC) is a discrete metric that describes how similar a landscape's fire regime is to its natural or historical state. FRCC quantifies the amount that current vegetation has departed from the simulated historical vegetation reference conditions (Hann and Bunnell 2001; Holsinger et al. 2006). The three condition classes describe low departure (FRCC 1), moderate departure (FRCC 2), and high departure (FRCC 3). Landscapes determined to fall within the category of FRCC 1 contain vegetation, fuel, and disturbances characteristic of the natural regime; FRCC 2 landscapes are those that are moderately departed from the natural regime; and FRCC 3 landscapes reflect vegetation, fuel, and disturbances that are uncharacteristic of the natural regime.

The Project vicinity contains a diverse mix of vegetation communities and land cover types, each having a distinct fire regime. All three categories of FRCC are found within the Project vicinity. The percentage of the Project vicinity defined by each Condition Class is summarized in **Table 3.7-3**, and shown on **Figures 3.7-2a** through **3.7-2d**. Fire regimes within the 200-foot-wide Project vicinity are shown on **Figures 3.7-3a** through **3.7-3d**.

Table 3.7-3 Acres of Lands Classified as Fire Regime Condition Class 1, 2, 3, Urban, or Agriculture by Alternative

	Alternative/Variant						
FERC	**A**	**A1**	**A2**	**B**	**C**	**C1**	**D**
Condition Class 1	17.4	12.0	3.5	11.0	10.0	3.5	18.4
Condition Class 2	329.1	338.8	290.4	268.3	297.5	286.7	511.5
Condition Class 3	30.7	30.7	29.2	24.9	25.0	25.0	52. 8
Urban/Development/ Agriculture	0	0	0	27.1	27.1	15.8	28.5
Agriculture	33.3	33.3	33.3	28.5	28.5	28.5	60.5

Source: Landfire 2008.

3.7.3.1 Mountain Pine Beetle

Bark beetles, including mountain pine beetles, are endemic to all coniferous forests of North America. The forests of the Rocky Mountains have seen a dramatic increase in bark beetle infestations followed by conifer mortality. The four species that are major hosts of mountain pine beetle infestation are lodgepole pine (*Pinus contorta*), ponderosa pine, sugar pine, and white pine. The lodgepole pine has suffered the greatest losses in this current bark beetle infestation. Lodgepole stands are vulnerable due to several factors including: 1) several years of drought; 2) existing stand conditions of old, overstocked and large diameter; 3) earlier melt in smaller drought impacted snow-packs; 4) and higher average temperatures allowing greater expansion on bark beetle lifecycles, movement and survival into higher elevations. The bark beetle wide scale outbreaks are the result of a variety of circumstances including large areas of suitable hosts, temperature thresholds, and precipitation patterns (Bentz 2008). The life cycle of the bark beetle is temperature dependent, and increased temperatures, especially in the winter can speed up reproductive cycles, and reduce cold-induced mortality (Bentz 2008). Bark beetle populations also are dependent on winter freezing periods, as the species is freeze-intolerant (Bentz et al. 2010).

Annual aerial surveys conducted for each of the national forests document the rate of spread for the current beetle epidemic. Surveys in the late 1990s indicated only few, scattered and otherwise endemic beetle infestations less than 10 acres each. Between 2007 and 2008, lodgepole stands from north to south along the Rocky Mountains were heavily infested with bark beetles.

At the rate of expansion of this current beetle infestation, it is believed that more than 80 percent of all lodgepole pines greater than 5 inches in diameter will be dead within the next 3 years along the Rocky Mountains (**Table 3.7-4**).

Table 3.7-4 Acres of Mountain Pine Beetle Infestation by Alternative

Forest Type	Alternative						
	A	Variant A1	Variant A2	B	C	Variant C1	D
Mixed conifer forest	0	30.1	20.0	70.7	41.4	32.0	70.7

It is important to note that many areas have been infested by bark beetles and the results of infestations are high levels of mortality among coniferous tree species. Though these areas generally exhibit large numbers of dead trees, they may not necessarily pose a hazard to the power lines themselves. As such, individual areas that contain large numbers of dead trees may not be affected by the Project, whereas some other areas that contain similar numbers of dead trees may be affected. Determinations of the hazards posed by the dead trees would be made on a site-by-site basis through coordinated efforts by the USFS and Western. Bark beetle infestations leave behind potentially heavy fuel loads as the insects spread across the landscape. Fuel loads, fuel types and inherent fire hazard levels change over time. In the first very obvious stage, the red needle stage, needles persist on the tree providing the means for a surface fire to transition into the forest canopy. Low moisture content in the dead needles allows the fire to move through the crowns more easily than would normal live green crown conditions. After dead needles fall, crown fire potential is significantly decreased, although forest floor fuel loads are substantially increased by the fallen needles. As needles and other fine fuels transition to the forest floor, the potential for high intensity surface fire increases and the potential for crown fire diminishes.

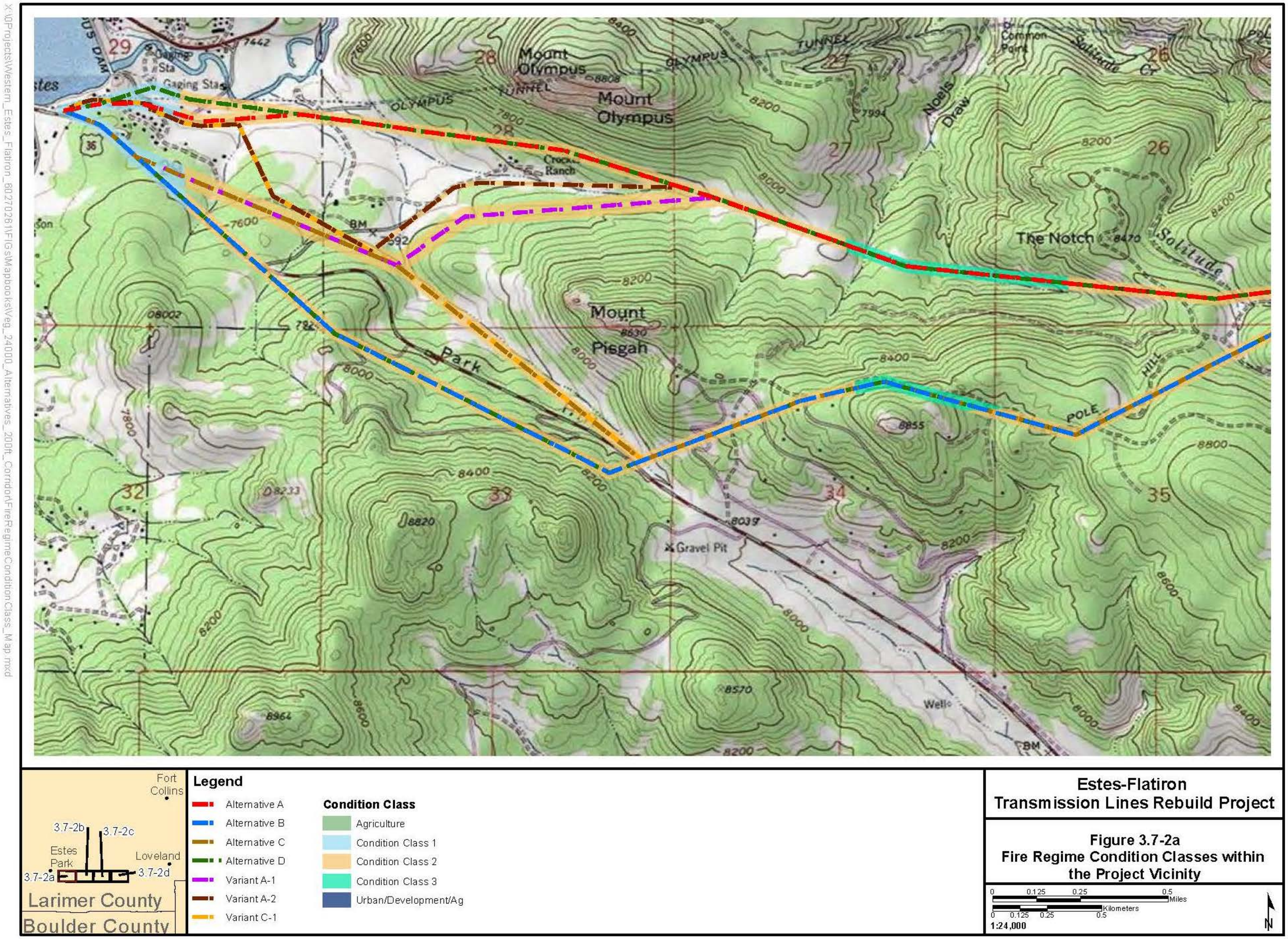
Five to 20 years following the initial beetle attacks, the dead trees begin to fall to the forest floor and become a substantial portion of the surface fuel load. At approximately this same interval, regenerated lodgepole pine stands are 2 to12 feet tall, adding to the fuel load for wildfire. At that stage, the potential fuel loads are the highest and most hazardous, due to the regenerating stands growing up through the dead fuels. Mixed large diameter dead fuels and pine regeneration stands create the potential for very severe surface fires along with increased difficulty for firefighting operations.

3.7.3.2 Fire Hazards

Defining the fire hazard allows the identification of the availability of fuels to sustain a fire in any given vegetation complex. Risk is associated with the method of fire start (ignition), whether human (accidental or intentional) or natural through lightning strikes.

Private lands bordering National Forest System lands in the Project area may be at risk from the hazard fuels build-up from mountain pine beetle mortality if an ignition occurs. Fuel treatment projects in and near private lands are performed to modify hazardous fuel conditions to lessen fire behavior during ignitions, thus decreasing resistance to control. Treatments also lower ease of ignition (risk). Further, treatment goals are to achieve some combination of: (a) reducing flammability, (b) reducing fire intensity, (c) reducing the potential initiation and spread of crown fires, and (d) increasing firefighter safety and effectiveness. As mountain pine beetle mortality and fuels accumulations increase, the human risk factor for ignitions may become a larger issue. Natural ignitions caused by lightning would continue to be a seasonal risk.

The Canyon Lakes Ranger District implemented the Thompson River Fuel Reduction Project on National Forest System lands in and around the Project area (USFS 2007). Treatments used to reduce fuel loads included thinning small diameter conifer trees, and the either piling and burning, or chipping and masticating this material. This has reduced the fuel load on portions of the forested areas that would be crossed by the Project.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Mount Olympus
Mount Pisgah
The Notch
Crocker Ranch
Gravel Pit
Fort Collins
Estes Park
Loveland
3.7-2a
3.7-2b
3.7-2c
3.7-2d
Larimer County
Boulder County
Legend
Alternative A
Alternative B
Alternative C
Alternative D
Variant A-1
Variant A-2
Variant C-1
Condition Class
Agriculture
Condition Class 1
Condition Class 2
Condition Class 3
Urban/Development/Ag
Estes-Flatiron
Transmission Lines Rebuild Project
Figure 3.7-2a
Fire Regime Condition Classes within the Project Vicinity
Miles
Kilometers
1:24,000

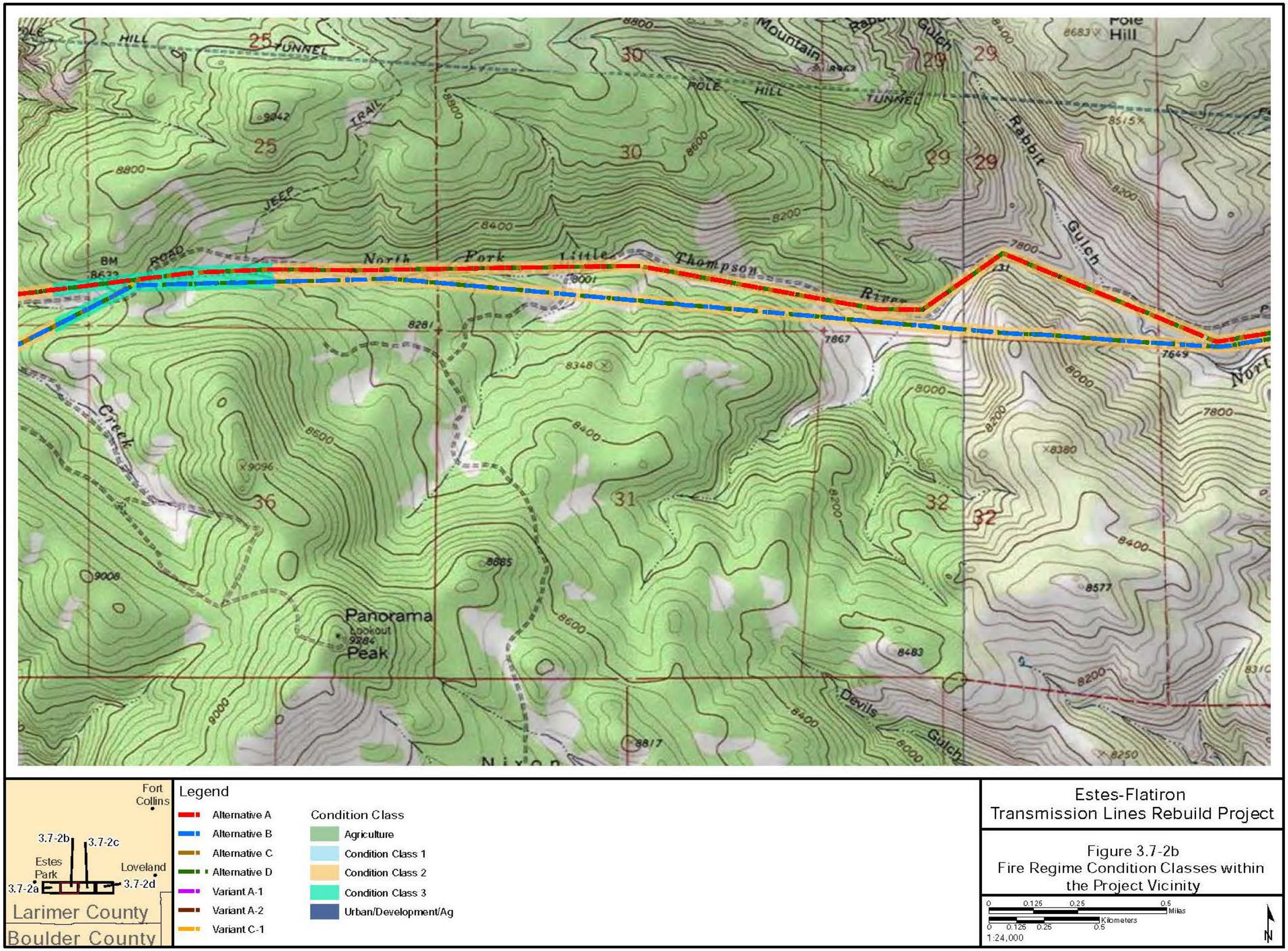
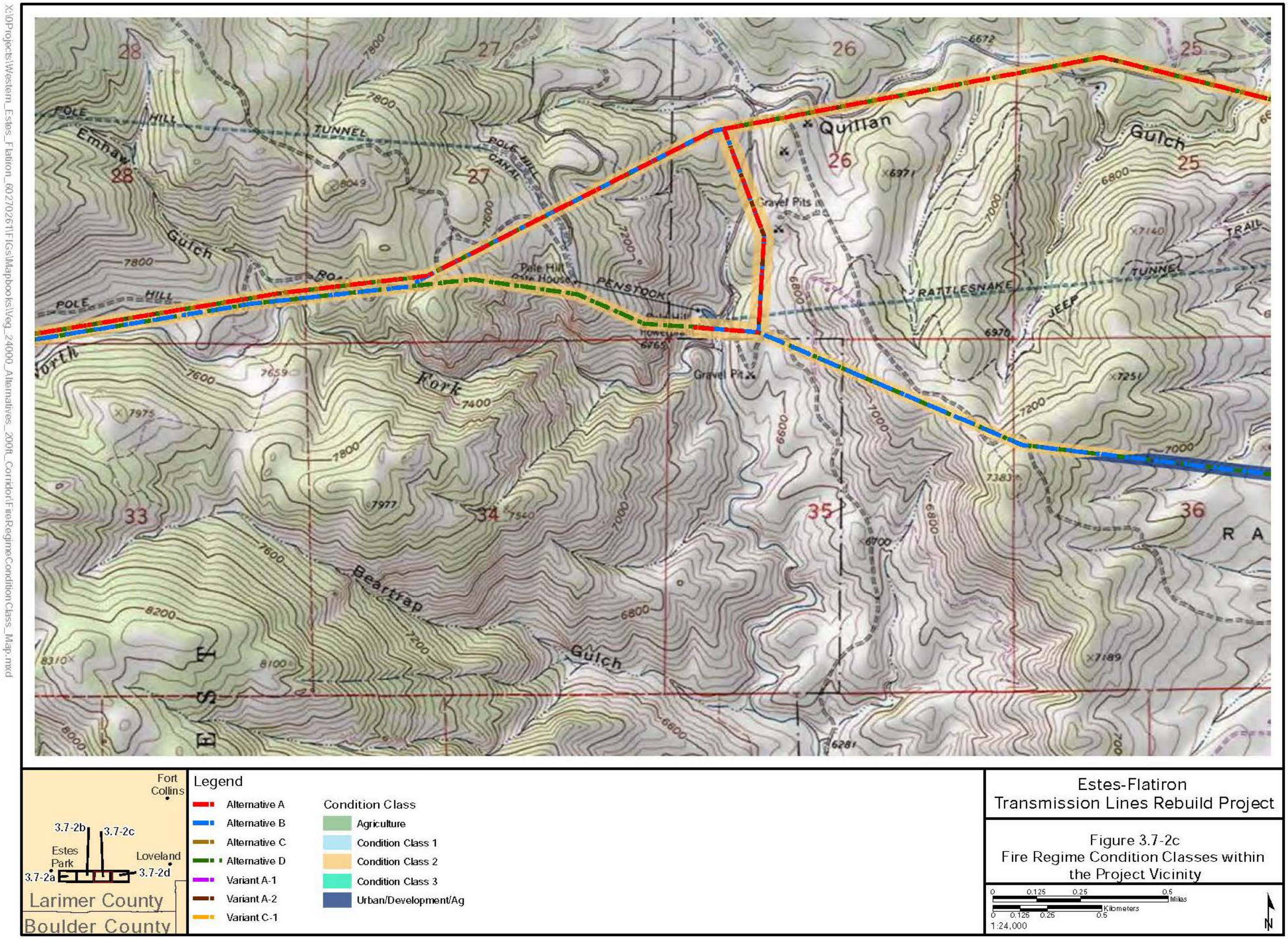


Figure 3.7-2b
Fire Regime Condition Classes within the Project Vicinity


Legend
Alternative A
Alternative B
Alternative C
Alternative D
Variant A-1
Variant A-2
Variant C-1
Condition Class
Agriculture
Condition Class 1
Condition Class 2
Condition Class 3
Urban/Development/Ag
Fort Collins
Estes Park
Loveland
3.7-2a
3.7-2b
3.7-2c
3.7-2d
Larimer County
Boulder County
Estes-Flatiron
Transmission Lines Rebuild Project
Figure 3.7-2c
Fire Regime Condition Classes within the Project Vicinity
Miles
Kilometers
1:24,000
N
Quillan
Gulch
Pole Hill
Tunnel
Pole Hill Canal
Penstock
Rattlesnake
Jeep
Trail
Emmaline
North Fork
Beartrap Gulch
Gravel Pits
Gravel Pit
X:\0Projects\Western_Estes_Flatiron_60270261\FIGs\Mapbooks\Veg_24000_Alternatives_200ft_Corridor\FireRegimeConditionClass_Map.mxd

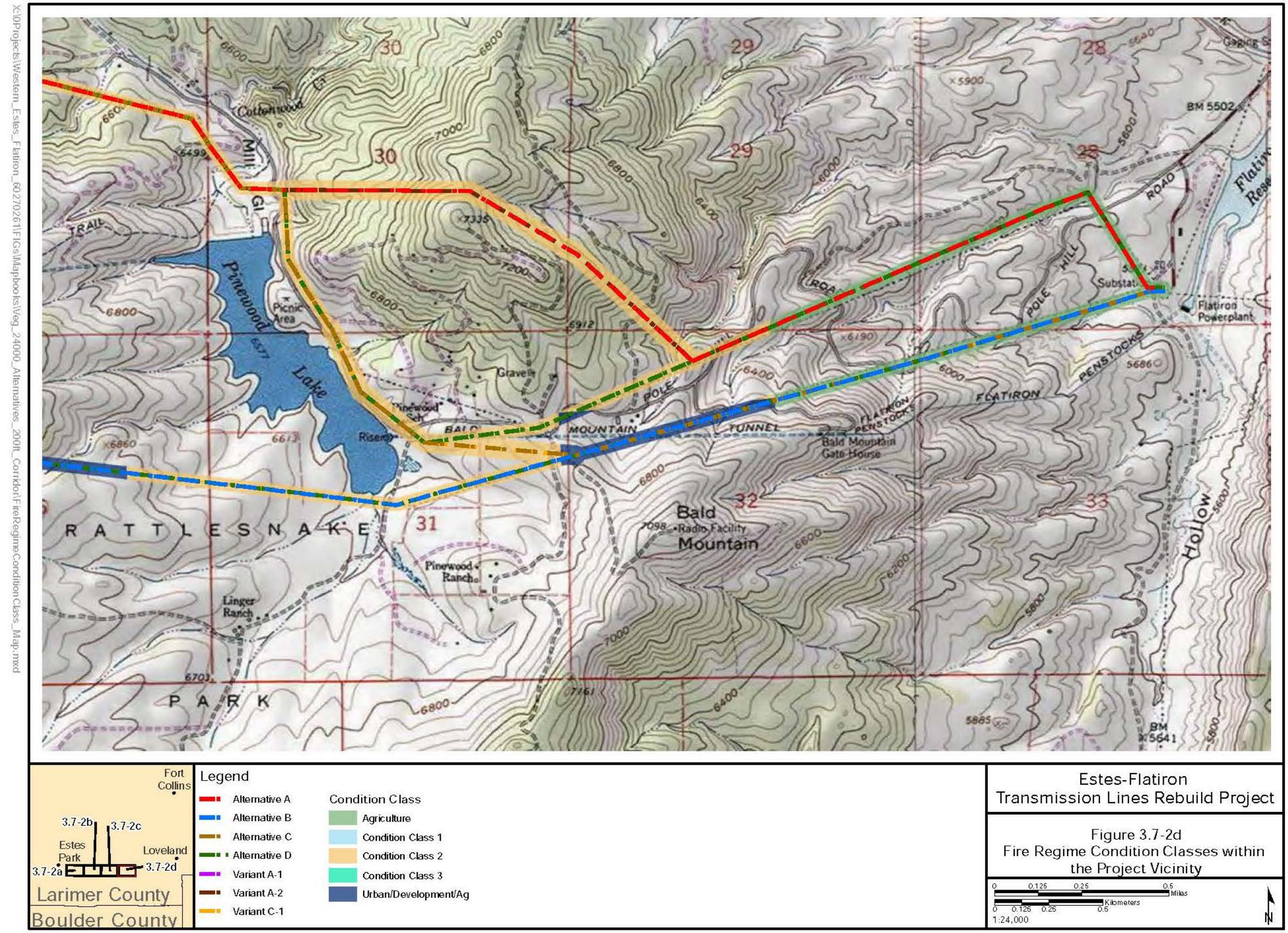
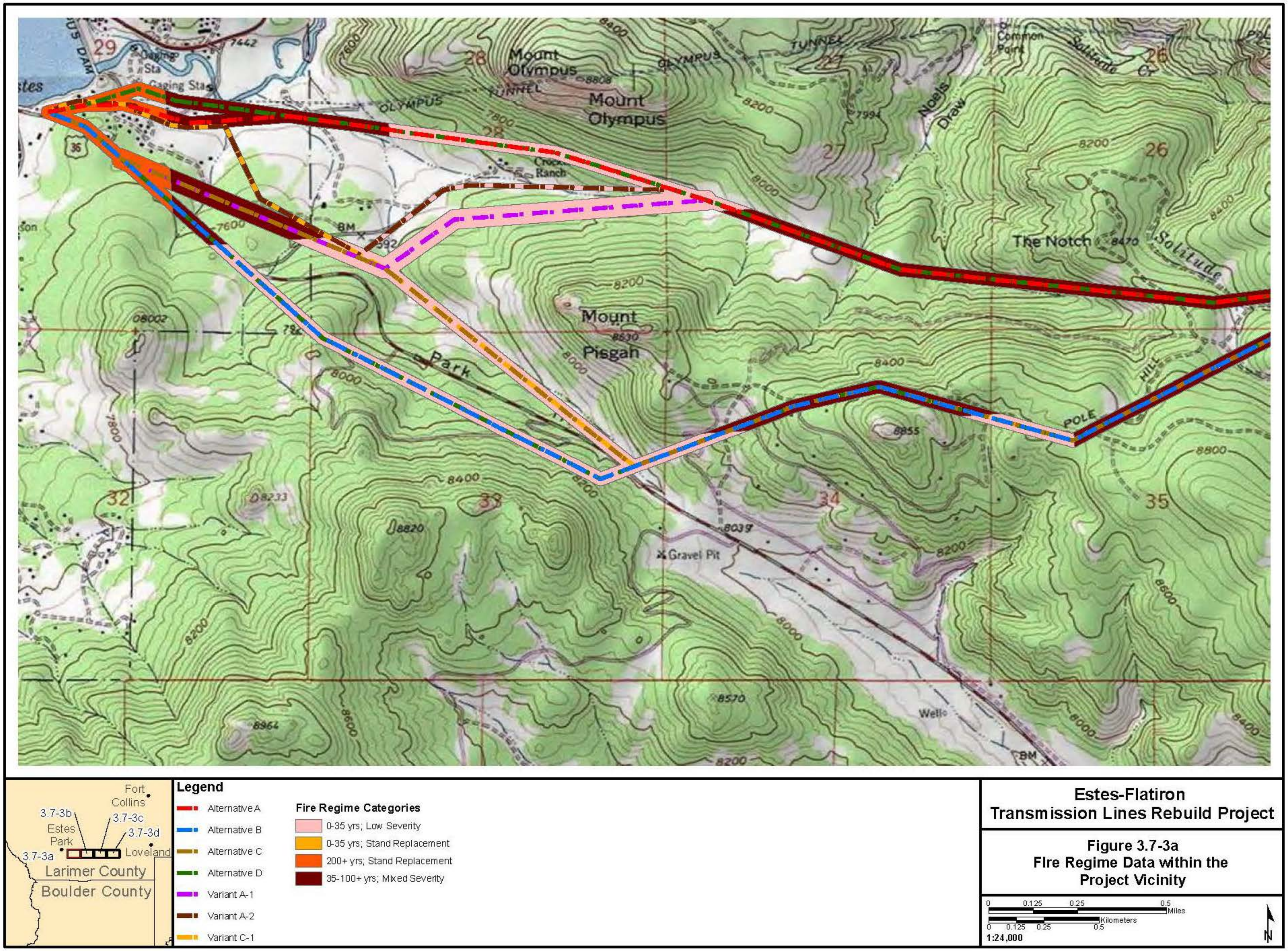
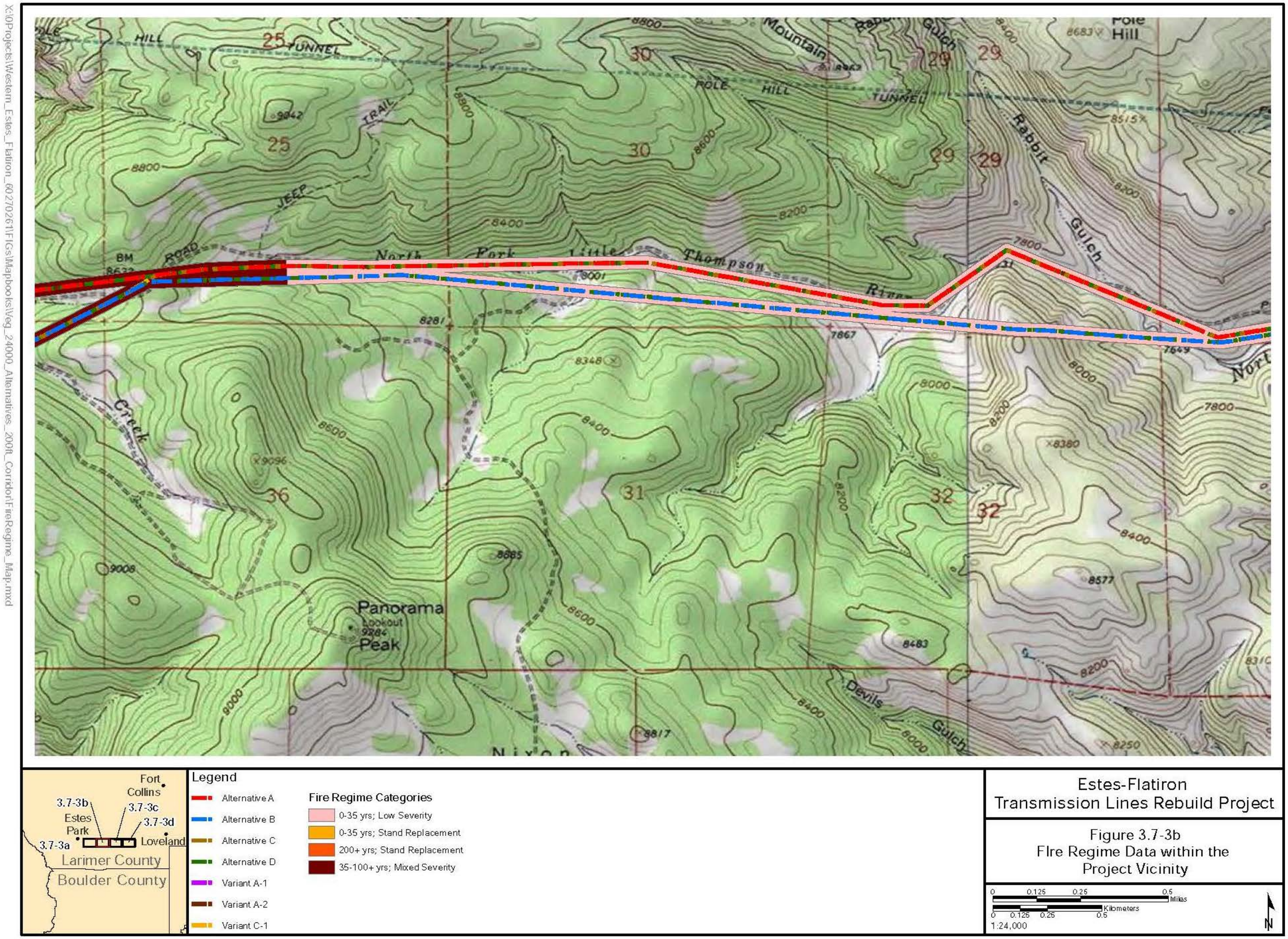


Figure 3.7-2d
Fire Regime Condition Classes within the Project Vicinity


Mount Olympus
Mount Olympus
Crock Ranch
The Notch
Mount Pisgah
Park
POLE HILL
Gravel Pit
Wells
Noels Draw
Solitude Cr
Common Point
Fort Collins
3.7-3b
3.7-3c
3.7-3d
Estes Park
3.7-3a
Loveland
Larimer County
Boulder County
Legend
Alternative A
Alternative B
Alternative C
Alternative D
Variant A-1
Variant A-2
Variant C-1
Fire Regime Categories
0-35 yrs; Low Severity
0-35 yrs; Stand Replacement
200+ yrs; Stand Replacement
35-100+ yrs; Mixed Severity
Estes-Flatiron Transmission Lines Rebuild Project
Figure 3.7-3a
Fire Regime Data within the Project Vicinity
Miles
Kilometers
1:24,000


Pole Hill
Panorama Peak
Lookout
North Fork Little Thompson River
Rabbit Gulch
Devils Gulch
Fort Collins
3.7-3b
3.7-3c
3.7-3d
3.7-3a
Estes Park
Loveland
Larimer County
Boulder County
Legend
Alternative A
Alternative B
Alternative C
Alternative D
Variant A-1
Variant A-2
Variant C-1
Fire Regime Categories
0-35 yrs; Low Severity
0-35 yrs; Stand Replacement
200+ yrs; Stand Replacement
35-100+ yrs; Mixed Severity
Estes-Flatiron Transmission Lines Rebuild Project
Figure 3.7-3b Fire Regime Data within the Project Vicinity
0 0.125 0.25 0.5 Miles
0 0.125 0.25 0.5 Kilometers
1:24,000
N
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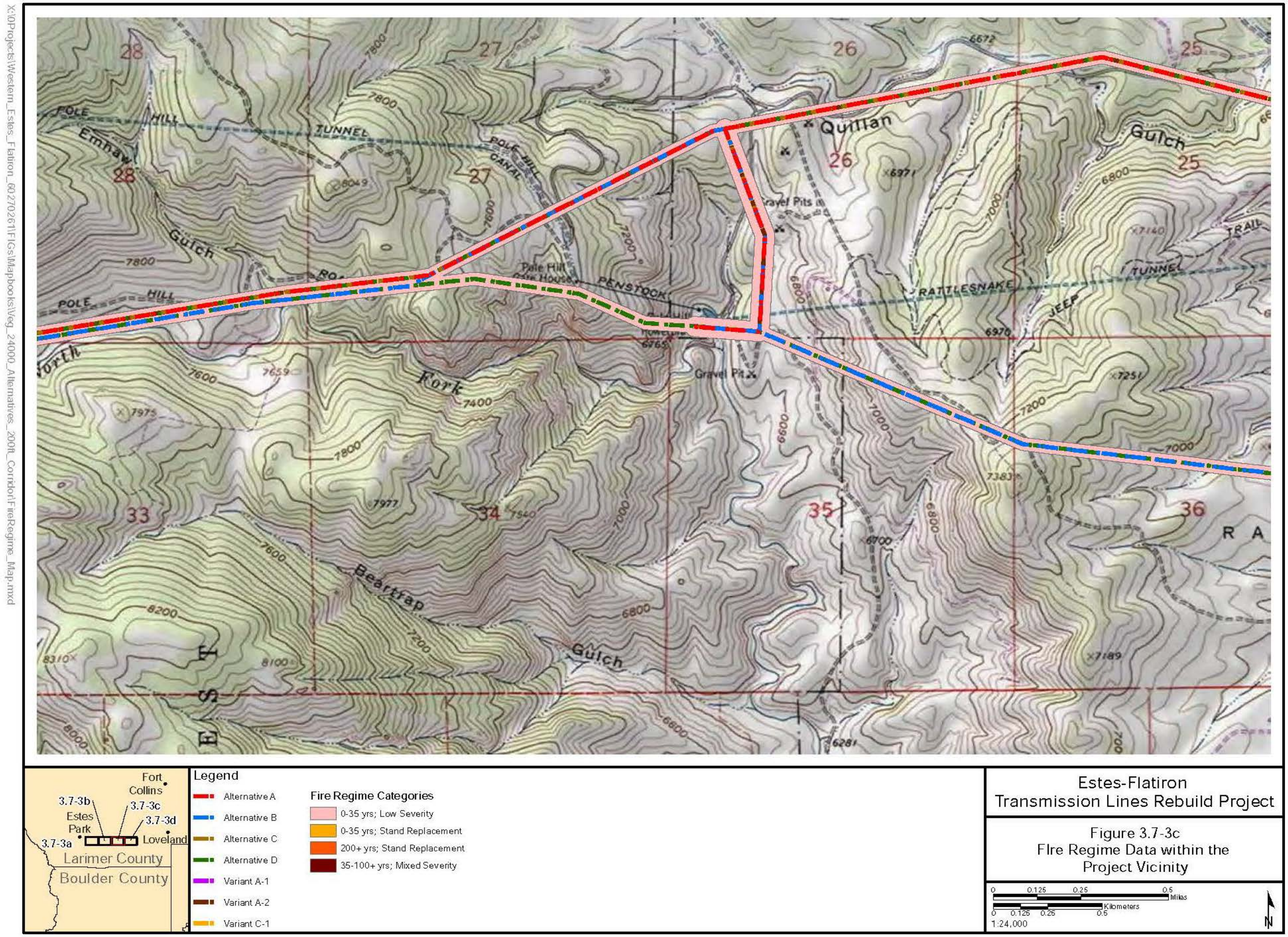
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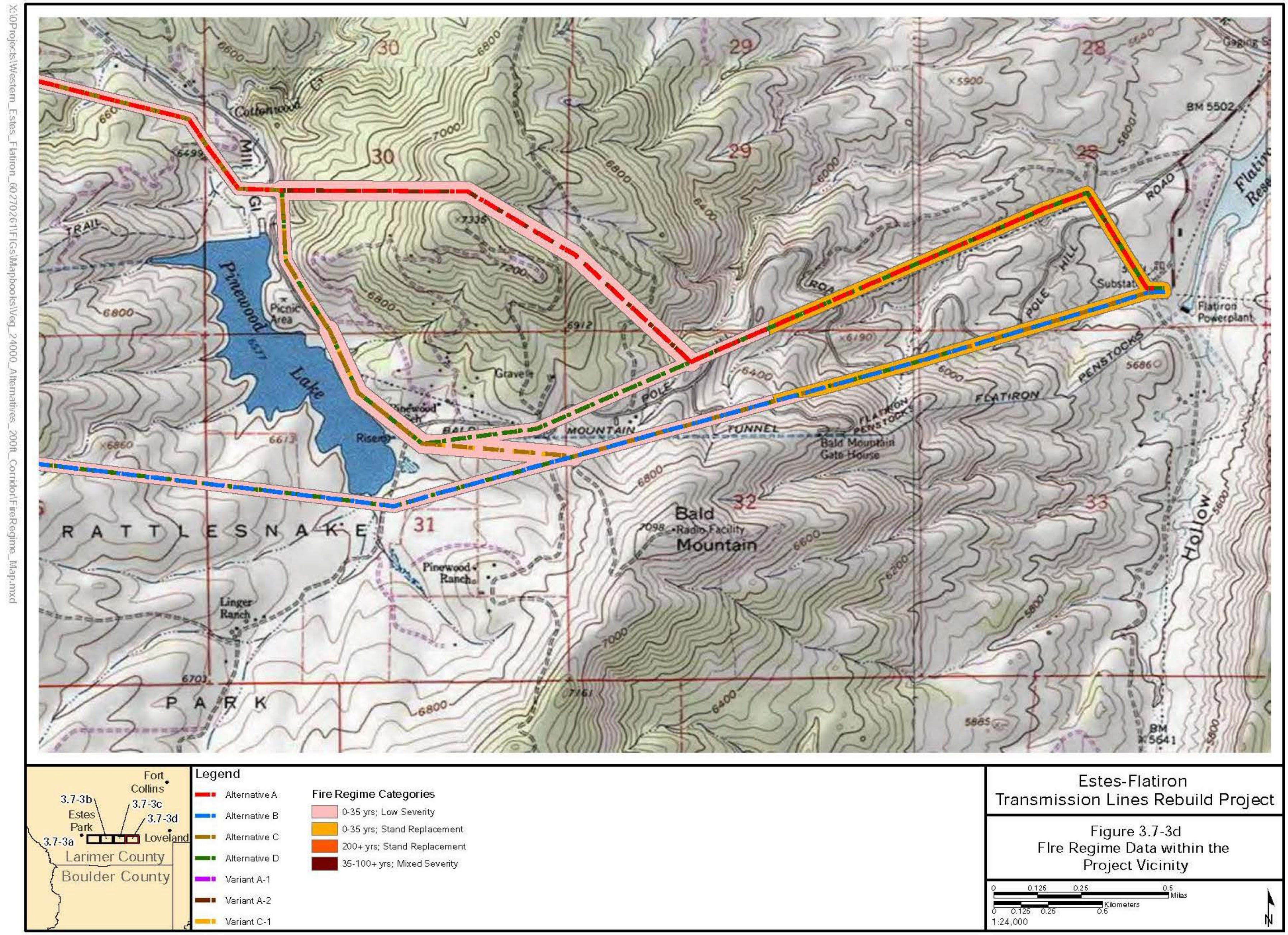
Fort Collins
3.7-3b
3.7-3c
3.7-3d
Estes Park
3.7-3a
Loveland
Larimer County
Boulder County
Legend
Alternative A
Alternative B
Alternative C
Alternative D
Variant A-1
Variant A-2
Variant C-1
Fire Regime Categories
0-35 yrs; Low Severity
0-35 yrs; Stand Replacement
200+ yrs; Stand Replacement
35-100+ yrs; Mixed Severity
Estes-Flatiron
Transmission Lines Rebuild Project
Figure 3.7-3c
Fire Regime Data within the
Project Vicinity
0 0.125 0.25 0.5 Miles
0 0.125 0.25 0.5 Kilometers
1:24,000
N


X:\0Projects\Western_Estes_Flatiron_60270261\FIGs\Mapbooks\Veg_24000_Alternatives_200ft_Corridor\FireRegime_Map.mxd
Fort Collins
3.7-3b
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Estes Park
3.7-3d
3.7-3a
Loveland
Larimer County
Boulder County
Legend
Alternative A
Alternative B
Alternative C
Alternative D
Variant A-1
Variant A-2
Variant C-1
Fire Regime Categories
0-35 yrs; Low Severity
0-35 yrs; Stand Replacement
200+ yrs; Stand Replacement
35-100+ yrs; Mixed Severity
Estes-Flatiron
Transmission Lines Rebuild Project
Figure 3.7-3d
FIre Regime Data within the
Project Vicinity
1:24,000
Pinewood Lake
Bald Mountain
RATTLESNAKE PARK
Flatiron Powerplant
Pinewood Ranch
Linger Ranch

3.8 Special Status and Sensitive Plant Species

Special status plant species are those species for which state or Federal agencies afford an additional level of protection by law, regulation, or policy. Included in this category are federally listed and federally proposed species that are protected under the ESA, or are considered as candidates for such listing by the USFWS, species that are state listed as threatened or endangered, and USFS sensitive species (FSM 2600; USFS 1997). The FSM 2600 (USFS 2005) provides policies pertaining to the management of sensitive plants on National Forest System land. This manual stipulates that the Forest Service provide special management importance for sensitive species to ensure their sustainability and preclude trends toward federal listing. The Forest Service accomplishes this by maintaining a list of sensitive plant species specific to the region (the Regional Forester's sensitive species list). In addition, the USFS defines Management Indicator Species (MIS) for each National Forest. An MIS is a plant or animal species selected because its status is believed to: 1) be indicative of the status of a larger group of species; 2) be reflective of the status of a key habitat type; or 3) act as an early warning of an anticipated stressor to ecological integrity. The key characteristics of MIS are that their status and distribution trends provide insight to the integrity of the larger ecological system to which they belong (USFS 1997).

The analysis area for the affected environment for Special Status and Sensitive Plant Species is a width of 200 feet for existing transmission lines centered on the ROWs for each alternative, 300 feet for new routing options, and 75 feet for the underground variants. See Section 3.7, Vegetation, for a description of the affected environment for general vegetation resources, and special status plant species within the Project area.

Based on data obtained from agency websites and agency contacts, 52 special status plant species were identified by the USFWS and USFS as potentially occurring within the Project area (Cedar Creek Associates 2014). Additional special status plant surveys will be conducted before construction (see Section 2.5). Occurrence potential within the Project area was evaluated for each of these species based on their habitat requirements and/or known distribution. Based on these evaluations, 31 special status plant species have been eliminated from detailed analysis because their known range is outside of the Project area, and/or the Project area does not include suitable habitat for these species. The remaining 21 species that have the potential to occur within the Project area are discussed below. No designated critical habitat for ESA-listed species occurs in the Project area. Additionally, there are no MIS plant species identified as having the potential to occur within the Project area (Cedar Creek Associates 2014). Species characterizations were compiled based on the USFS Biological Report (Cedar Creek Associates 2014).

3.8.1 Federal Threatened, Endangered, Proposed, and Candidate Species

An official USFWS, Colorado Ecological Services species list for the Estes-Flatiron Transmission Line Rebuild Project in Larimer County was requested and received from the USFWS on-line Information, Planning, and Conservation decision support system on December 6, 2011, December 10, 2013, and July 27, 2017 to check for updates. Four federally listed plant species: Colorado butterfly plant (Gaura neomexicana var. coloradensis), North Park phacelia (Phacelia formosula), Ute ladies'-tresses orchid (Spiranthes diluvialis), and the western prairie fringed orchid (Platanthera praeclara) were identified by the USFWS as potentially occurring within the project area. Based on further analysis of the known range, historic distribution, and habitat association each of these species, the Ute ladies'-tresses orchid is the only federally listed species with potential to occur in the analysis area. Additional special status plant surveys will be conducted before construction (see Section 2.5). Typical sites where it occurs include old stream channels and alluvial terraces, sub-irrigated meadows, seasonally flooded terraces, various human-modified wetlands (irrigation canals, etc.) and other sites where the soil is saturated to within about 18 inches of the surface at least temporarily during the spring and summer growing seasons. Over one-third of all known Ute ladies'-tresses populations are found on alluvial banks, point bars, floodplains, or ox-bows associated with perennial streams. The plant also appears to prefer well-drained soils with fairly high moisture content. This species rarely occurs in deeply shaded sites and is not found in uplands, sites entirely inundated by standing water, heavy clay soils, very saline sites, heavily disturbed sites (including plowed fields), steep stream banks, or sites supporting stands of dense rhizomatous plant species. Vegetation associated with Ute ladies-tresses orchid typically falls into the Facultative Wet classification; it occurs primarily in areas where vegetation is relatively open and not overly dense, overgrown, or overgrazed. Species typically associated with the Ute ladies'-tresses orchid include scouring rush (*Equisetum* sp.), swamp milkweed (*Asclepias incarnata*), blue vervain (*Verbena hastata*), slender false foxglove (*Agalinus tenuifolia*), great blue lobelia (*Lobelia siphilitica*), blue-eyed grass (*Sisyrinchium* sp.), redtop (*Agrostis stolonifera*), reedgrass (*Calamagrostis* sp.), and goldenrod (*Solidago* sp.) (USFWS 2013a). This species occurs in seasonally moist soils and wet meadows near springs, lakes, or perennial streams and their floodplains at or below approximately 7,000 feet elevation.

The majority of the Project area is above 7,000 feet except for the portions immediately west of Pinewood Reservoir and east to the eastern portion of the Project area. The Project area below 7,000 feet crosses 22 drainages and a few wetlands. Eight of the drainages are channels supporting only upland plant communities. Ten others are ephemeral drainages exhibiting incised channels with narrow, dense, abutting wetlands, notably dense shrub overstories, plant communities dominated by obligate wetlands, or a combination of these characteristics, which do not provide suitable habitat conditions for the Ute ladies'-tresses orchid. Four wet meadows habitats were identified in the remaining drainages. Three of these wet meadows exhibited notably tall, dense vegetation and were dominated primarily by obligate wetland plant species. As a result of these conditions, these three wet meadows features do not support suitable habitat for the orchid. Only one wet meadow, at the south end of Pinewood Reservoir, exhibited the habitat characteristics that could support the orchid, although vegetation cover was relatively dense for the orchid. This species was not observed in this meadow within the Project area during field surveys, although survey timing was early for the accepted survey time period for this species (late July through August). Western has committed to additional plant surveys and appropriate consultation for all applicable species with the USFWS and USFS along the final transmission line route prior to construction for all applicable species.

3.8.2 Forest Service Sensitive Species

Park milkvetch (*Astragalus leptaleus*) is a perennial forb with mat-forming stems. The species is found from 6,500 to 9,500 feet in sedge-grass meadows, swales, hummocks, and in association with streamside willows. It is often found in the transition zone between saturated soils and dry uplands. The species is found in Idaho, Montana, Wyoming, and Colorado. In Colorado, the species is found in Jackson, Chaffee, Larimer, Summit, Park, and Gunnison counties. It is a regional endemic that has been collected in Larimer County on the Roosevelt National Forest. The population trend of Park milkvetch is unknown, but the species appears to be in decline. Threats to this species' populations and habitat include conversion of wet meadows to haying, livestock grazing, peat and placer mining, weed invasion, and other activities as well as droughts that contribute to a drying of habitat. Suitable habitat was observed in and adjacent to wetland drainages, meadow wetlands, and a fen within the Project area.

Triangle moonwort (*Botrychium ascendens*) is a fern found throughout Yukon Territory, British Columbia, Alberta, Saskatchewan, Ontario, Oregon, Washington, Idaho, California, Nevada, Montana, and Wyoming. Habitat for the species is montane, moist, early successional vegetation communities on volcanic or granitic alluvium. It has been found growing on moist hummocks within wetlands. There are no known occurrences of the species in Colorado. Primary threats to this species include road construction and maintenance, herbicide applications, grazing and trampling, weed competition, and site development. Suitable habitat for the species is found in the Project area in and adjacent to wetland drainages, and wetlands. Early successional habitats for this species would be the same as described for *Botrichium lineare*.

Paradox (peculiar) moonwort (*Botrychium paradoxum*) is a fern found in montane and mesic to wet subalpine mountain meadows with grasses and sedges. Detailed habitat information on this species is limited. Threats to the species include grazing, trampling, and off-road vehicles. Suitable habitat is found in the Project area.

Plains rough fescue (*Festuca hallii*) is a perennial graminoid of the grass family (Poaceae) that typically inhabits alpine and subalpine grasslands and meadows. It is found in Canada, Washington, Montana, Wyoming, North Dakota, and Colorado, where it reaches its southernmost Rocky Mountain distribution. In Colorado, *F. hallii* has been seen at only one location within the last 20 years, at Cordova Pass on the San Isabel National Forest. Two other occurrences are known from the Roosevelt National Forest, but these have not been seen since the 1950s. Two other vague records report *F. hallii* from Custer and Park counties. Although the Colorado rank is SH (state historical, a rank given to species not seen in the state since 1920), fieldwork in 2005 and 2006 (Anderson 2006) showed that the species is present at the historical site near Spanish Peaks. Threats include livestock grazing, fire and fire suppression, invasion by exotic species, residential development, recreation, effects of small population size, pollution, and global climate change. Livestock grazing, in particular, appears to be detrimental to Hall's fescue (Anderson 2006). Suitable habitat occurs in association with upland meadows.

Rocky Mountain cinquefoil (*Potentilla rupincola*) is a perennial forb found in mountains between 6,900 and 10,500 feet on granitic outcrops or thin, gravelly granitic soils with west or north exposure. It is often associated with ponderosa pine and limber pine communities. It is known to occur at 23 locations in Larimer, Boulder, Clear Creek, and Park counties in Colorado. Most populations occur in Larimer County in Cherokee Park and Virginia Dale. It occurs on the Roosevelt National Forest, and this species has been observed to the west of The Notch in Section 24, T5N, R73W (1897) and in Sections 28 and 33, T5N, R72W. Populations of Rocky Mountain cinquefoil appear to be relatively stable. However, a single disturbance event could feasibly extirpate or severely reduce a small occurrence. Threats include invasion by non-native plants, habitat loss from residential and commercial development, secondary impacts of grazing, ROW management, off-road vehicle use and other recreation, global climate change, and pollution. Suitable habitat for the species is found in the Project area in areas of rock outcrops and adjacent coarse soils.

Rocky Mountain monkeyflower (*Mimulus gemmiparus*) is a perennial herb of the figwort family (Scrophulariaceae) found in granitic seeps, slopes, and alluvium in open sites in spruce-fir and aspen forests at 8,500 to 10,500 feet elevation. The species is endemic to the mountains of central and northern Colorado, where it is known from only eight occurrences in Grand, Jefferson, Larimer, and Park counties. The species has a unique reproductive strategy; the leaf petioles are modified to contain dormant embryos (the specific epithet gemmiparus refers to a gemma, an asexual reproductive mechanism often found in mosses). The primary threat to Rocky Mountain monkeyflower is the small size of populations; a single disturbance could feasibly completely destroy an occurrence. Activities that could impact an occurrence include recreation; invasion by nonnative plant species; trail and road construction and maintenance; wildfires; and forest management activities such as logging, thinning, or prescribed fires. Suitable habitat occurs in association with the mixed conifer woodland.

Scarlet gilila *(Ipomopsis aggregata* ssp*. Weberi*) is a rare taxon with a limited geographic range. It is known from the Park Range region in Colorado and the Sierra Madre Range in Wyoming. The majority of the total known occurrences (approximately 17 of 27) are located on the Routt National Forest. There are approximately three known occurrences on the Medicine Bow National Forest. There may have been some loss of range within the last century in Colorado. In 1903, a specimen was collected from the Chambers Lake area, which is currently managed by the Roosevelt National Forest. No specimens have been reported from that area since then. *Ipomopsis aggregata* ssp*. Weberi* is restricted to areas with low vegetation cover, suggesting that it will be unable to compete with invasive plant species. It grows on old road cuts and in forest and shrub clearings and appears to be an early or mid-successional species. It can persist in, or re-colonize, areas after vehicle or animal disturbance although the sustainability of populations at high disturbance sites is unknown (Ladyman 2004). Suitable habitat occurs in association with the upland meadows.

Selkirk violet (*Viola selkirkii*) is small perennial herb that may grow to a few inches in height. The species is found in cold mountain forests, moist woods, and thickets. It is rare in Colorado, typically found at the base of aspen trees at 8,500 to 9,100 feet. The species ranges from Alaska and Canada to the northeastern U.S., upper Midwest, and Washington, with disjoint populations in New Mexico and Colorado. In Colorado, the species has been found in Douglas, El Paso, and Larimer counties. In Region 2 Selkirk violet occurs in small and disjoint populations, leaving it vulnerable to stochastic events. Threats to the species include recreation, invasion by non-native plant species, wildlife and livestock grazing and trampling, road and trail construction and maintenance, forest management activities, and climate change. Suitable habitat is found within the Project area in the higher elevation areas in forested areas, and small, scattered aspen stands.

Yellow lady's slipper (*Cypripedium parviflorum* [*C. calceolus* spp. *parviflorum*]) is a perennial herb found in a variety of shaded, moist habitats, including moist aspen forests, and ponderosa pine/Douglas fir forests, in rich humus and decaying leaf litter in wooded areas, rocky wooded hillsides on north- or east-facing slopes, on wooded loess river bluffs, and moist creek borders at elevations ranging from 7,400 to 8,500 feet. The species is widespread in North America but uncommon in most of its range. Populations are widely scattered in Colorado where the species is known in ten counties at a narrow elevation range of 7,400 to 8,500 feet. It has been present in Larimer County. Little is known regarding the population trend of *Cypripedium parviflorum*. It is believed to be in decline due to habitat loss. This species is threatened by habitat alteration (including conifer encroachment, grazing, development, etc.), overstory modification, changes in soil and hydrological regimes, land management activities, unauthorized recreation, and over-collection. Suitable habitat is located in the Project area along north-facing slopes and in association with wetland drainages.

3.8.3 Additional Species of Concern

The USFS provided a list of additional plant species of local concern for the Project area (Cedar Creek Associates 2014). Thirteen species of concern have suitable habitat in the Project area or potentially could be impacted by the Project.

Bitter-root (*Lewisia rediviva*) is a small, perennial herb that typically blooms in early spring on gravelly flats. There is one record of the species from the east slope. The species also has been found in Larimer County in habitat similar to that supporting *Botrychium* species (described above). Gravelly flats are rare to non-existent across the Project area.

Fragile fern (*Cystoperis fragile),* similar to other fern species, typically grows in moist, rich soil in forests and at the bases and cracks of rock cliffs at elevations in excess of 5,000 feet. Habitat occurs along the majority of the drainages exhibiting abutting wetlands (e.g., Solitude Creek, tributary to Noels Draw, etc.), the fen located along the Project, and where rock outcrops are a dominant topographic feature. Rock outcrop habitat occurs in other areas sporadically across the Project area. A few populations of *Cystoperis fragilis* were observed in rock outcrop habitat within the Project area.

Dwarf rattlesnake-plantain (*Goodyera repens*) is a perennial orchid that typically inhabits shady sites on north- to east-facing slopes in mixed conifer stands and also can be found along banks of small streams, in forest duff, and in moss at elevations from 8,000 to 9,500 feet. Habitat for this species occurs in the Project area, especially in the wetland drainages.

Lance-leaved grapefern (*Botrychium lanceolatum*) is a perennial forb found in rocky or gravelly sites in montane, often in sparsely vegetated areas, but occasionally under young trees or shrubs. It is often associated with old disturbances. It is currently considered one of the more common moonwort species in Colorado. This species is classified as a facultative wetland plant by the USACE. Available habitat preference data is at somewhat varied for this species. Rocky/gravelly sites and old disturbances occur in sporadic areas in the Project area. The species could occur in the Project area in historically cleared areas resulting from previous construction activities. However, no *Botrychium* species were observed during previous surveys in these areas. Suitable habitat was observed occurring as small, scattered patches in three spots in the Project area. Suitable habitat for this species within the USFS tracts associated with wetlands is the same as listed for *B. multifidum*.

Larimer aletes (*Aletes humilis*) is a perennial forb that occurs in cracks in massive rocks and adjacent thin soils composed of disintegrated granite. It also may occur in duff under ponderosa pine at elevations ranging from 6,500 to 8,700 feet. Suitable habitat occurs in areas of rock outcrops and adjacent coarse soils. Other areas of smaller, localized rock outcrops occur in a mosaic pattern with soils lacking outcrop features that could provide marginal habitat. With respect to occurrence in duff soil types, this species could occur at numerous sites within the Project area where ponderosa pine overstories dominate.

Least grapefern (*Botrychium simplex*) is a perennial forb. Habitat for this species is centered upon wetlands and wet substrates in Colorado. Sutiable habitat for this species within National Forest System lands is the same as listed for *B. multifidum*.

Leathery grapefern (*Botrychium multifidum*) is a perennial forb that inhabits graminoid wetlands and willow carrs, and is rare in Colorado. Suitable habitat is found in the Project area in wetlands across the Project area.

Botrychium pinnatum is a perennial forb most commonly found in moist grassy sites in open forests and meadows and often occurs near streams and other sites where soil moisture is constant. Suitable habitat occurs near wetlands and in wet/moist meadows along the Project area.

Pictureleaf wintergreen (*Pyrola* picta) is a perennial subshrub found in cool, moist slopes and ravines in lodgepole pine, Douglas-fir, and Ponderosa pine forests at elevations ranging from 6,000 to 9,800 feet. Suitable habitat for this species is found in the Project area.

Purple lady's slipper (*Cypripedium fasciculatum*) is a perennial forb found in open to densely shaded lodgepole pine and less often spruce-fir forests at elevations ranging from 8,000 to 10,500 feet. Given the elevation range, habitat for this species is confined to the center of the Project area in coniferous stands.

Rattlesnake fern (*Botrychium virginianum*) is a perennial forb that inhabits aspen stands and cool ravines. Habitat preference data for this species is limited. The species is classified as a facultative upland species by the USACE. Aspen stands are limited to rare within the Project area. Cool, north-facing ravines were not observed, although a similar habitat supporting a dense vegetation community was found on a south-facing ravine near the center of the Project area.

Silkyleaf cinquefoil (*Potentilla ambigens*) is a tall, conspicuous plant that inhabits waste places, weedy sites, and edges of forests at elevations ranging from 6,000 to 9,400 feet. Waste places and weedy sites are rare to non-existent along the Project area. However, if cleared areas along the edges of the existing transmission lines and roads function as "forest edges," the species could occur along the majority of the Project area boundaries and the edges of existing roads. As noted above, this species is a conspicuous plant that was not observed during the field surveys, and it is assumed that suitable habitat is limited.

Spatulate moonwort (*Botrychium spathulatum*) is a perennial forb found within stabilized, sparsely vegetated grassy meadows. The type of habitat is limited within the Project area, consisting of rocky/gravelly sites and old disturbances that occur in sporadic areas in the Project area. *Botrychium* habitat was identified in the Project area, but no plants were observed.

Wood lily (*Lilium philadelphicum*) is a perennial forb found in cool, moist slopes and ravines with lodgepole pine, Douglas-fir, and ponderosa pine overstories. The elevation range for this species in Colorado is 6,000 to 9,800 feet. Suitable habitat for the species occurs in the Project area in forested, fen and drainage features.

3.9 Wildlife

Wildlife resources in the Project vicinity include wildlife habitats and features that were field evaluated along the existing ROWs and accessible access roads for the E-FL lines in 2011 (Cedar Creek

Associates 2014). Field surveys were conducted to characterize existing wildlife habitats, as well as to identify any unique or sensitive natural resource features. Observations recorded during the field evaluation of the Project vicinity included: major wildlife habitats/vegetation communities present within the property; dominant vegetation associated with each habitat/community; unique habitat features; and observations of wildlife species or their definitive sign. The locations of unique wildlife habitat features were recorded with a hand-held GPS unit.

Information regarding wildlife species and their habitat within the Project vicinity was obtained from multiple sources: (1) published literature; (2) unpublished agency reports and data; (3) Colorado Natural Heritage Program (CNHP) database search; (4) CPW Natural Diversity Information Source (NDIS) mapping system; and (5) field surveys.

The topography, water resources, and vegetation of the Project vicinity create a diversity of habitats and habitat features that support a variety of wildlife species. Additional discussion of vegetation community/habitat types are discussed in detail in Section 3.7, Vegetation. More detailed descriptions of riparian/wetland communities and upland communities are provided in Sections 3.5 and 3.6, respectively.

Perennial aquatic habitat within the analysis area is restricted to the North Fork Little Thompson River and the Big Thompson River. The Big Thompson River is within the analysis area near a short segment of the west end of the ROW but would not be affected by the Project. The North Fork Little Thompson River is the only perennial drainage within the analysis area that is crossed by the existing ROWs, but portions of the drainage within the analysis area have flows too low to support any significant fisheries. Existing ROWs and new aboveground ROW alignments would span the North Fork Little Thompson River. Appropriate crossing methods would continue to be used at this location during construction and maintenance. Therefore, aquatic habitats and fisheries resources are not further described in this section.

3.9.1 Big Game

Five big game species are found within the Project vicinity: Rocky mountain elk (*Cervus canadensis*), mule deer (*Odocoileus hemionus*), moose (*Alces alces*), black bear (*Ursus americanus*), and mountain lion (*Puma concolor*). Bighorn sheep occur in the region, but the Project vicinity is outside of the documented range of occurrence of this species (NDIS 2012). The CPW NDIS mapping system was accessed on January 26, 2012 (NDIS 2012) to obtain distribution and range information for state game species of interest addressed by this analysis.

3.9.1.1 Elk

In Colorado, elk range covers the western two-thirds of the state, generally at elevations above 6,000 feet, although they are occasionally reported in the South Platte River drainage on the eastern plains (Armstrong et al. 2011).

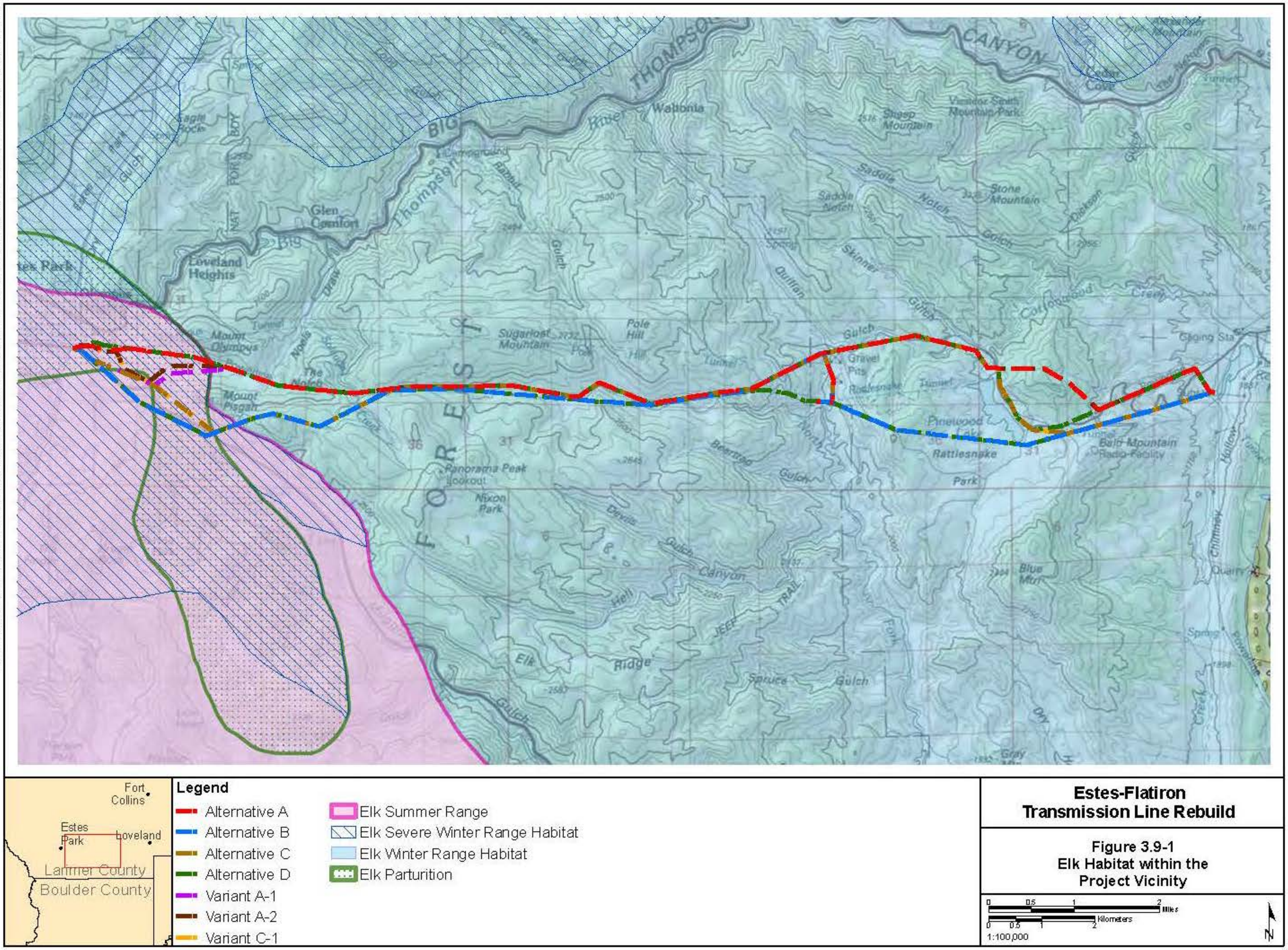
Elk breed in the fall with the peak of the rut in Colorado occurring during the last week of September and first week of October. Breeding typically is over by late October. Most calves are born in late May to early June. Calving grounds generally are in areas where forage, cover, and water are in juxtaposition. Elk tend to inhabit higher elevations during spring and summer and migrate to lower elevations for winter range. Spring and fall migrations are tied to weather and forage availability. Snow depths of about 6 inches may trigger elk movement to lower elevation winter ranges (Armstrong et al. 2011).

The Project vicinity is within the Big Thompson River Basin and is located within the Saint Vrain Herd Unit (Data Analysis Unit [DAU] E-9, Game Management Unit 20), which overlaps the Canyon Lakes District south of the Buckhorn Road and east of Rocky Mountain National Park. According to CPW information, the herd currently numbers about 2,470 elk (post-hunt 2011), which is within the current population range objective of 2,200 to 2,600.

Overall range is defined as the area that encompasses all known seasonal activity areas within the observed range of an elk population. The CPW defines winter range as that part of the overall range of a species where 90 percent of the individuals are located during the average 5 winters out of 10 from the first heavy snowfall to spring green-up, or during a site-specific period of winter as defined for each DAU. Severe winter range is defined by the CPW as that part of the range of a species where 90 percent of the individuals are located when the annual snowpack is at its maximum and/or temperatures are at a minimum in the two worst winters out of ten. Winter concentration areas are described as that part of the winter range of a species where densities are at least 200 percent greater than the surrounding winter range density during the same period used to define winter range in the average 5 winters out of 10. The CPW defines summer range as that part of the range of a species where 90 percent of the individuals are located between spring green-up and the first heavy snowfall, or during a site-specific period of summer as defined for each DAU. Finally, elk production areas are described by the CPW as that part of the overall range of elk occupied by the females from May 15 to June 15 for calving. (Only known areas are mapped and NDIS mapping does not include all production areas for a DAU.)

Based on CPW range mapping, elk may be found in the Project vicinity at any time of the year, but higher summer use, production, and winter use is restricted primarily to the far west end of the west region of the area. NDIS (2012) big game range mapping shows the entire Project vicinity to be within overall and winter range for elk. The far western portions of the area (existing structure numbers 2-4 to 0-7, North Line and 3-3 to 0-7, South Line) are within severe winter range and a winter concentration area (NDIS 2012). Elk summer range is located primarily at higher elevations to the west of the Project, but a small segment of summer range overlaps a small portion (structure number 3-3 to 2-8) of the E-PH ROW (NDIS 2012). An elk production area also is identified at the west end of the Project (structure numbers 2-8 to 2-1, South Line and 2-4 to 0-7, North Line) (NDIS 2012). The Project vicinity also is contained within a designated elk migration corridor that begins in the Pole Hill area (structures 8-8, North Line and 7-1, South Line) and extends to the western edge of Loveland. This is considered a major migration corridor used by approximately 1,000 elk from about the third week of August to the end of January (Spowart 2012). Elk habitat in the Project vicinity is displayed on **Figure 3.9-1**.

Although all five of the vegetation types present within the Project vicinity and discussed in Section 3.7.1, General Vegetation, provide suitable habitat for elk, the specific use of these habitats can vary depending on the seasonal availability of forage and cover. Field surveys indicated that vegetation types (grassland/forb meadows, shrublands, and aspen) provide moderate-quality forage habitat. There are areas of open mature pine forest and grassland/meadow and riparian areas along Solitude Creek and the North Fork Little Thompson River. These vegetation types also are common on the private parcels located between National Forest System lands. Forage also is present within forested stands in the form of shrubs, grasses, and herbaceous species, but less so in cover types other than open mature and sapling/pole stands, which are not present in the analysis area. The mix of habitat types in the general area provides moderate to high quality elk habitat.



Estes-Flatiron Transmission Line Rebuild

Figure 3.9-1 Elk Habitat within the Project Vicinity

3.9.1.2 Mule Deer

The Project vicinity within the Big Thompson River Basin is located within the Big Thompson Deer Herd range (DAU D-10, Game Management Unit 20), which overlaps the Canyon Lakes District south of the Buckhorn Road and east of Rocky Mountain National Park. According to CPW information, the herd currently numbers about 4,970 deer (post-hunt 2011), which is just above the current population objective of less than 5,000 deer. This objective was implemented in 2001 to reduce the herd in an attempt to reduce the prevalence of chronic wasting disease.

NDIS big game range mapping shows the Project vicinity to be within overall, winter, and summer range for mule deer (NDIS 2012). The far west end of the Project vicinity is within mule deer severe winter range and a winter concentration area (NDIS 2012). The approximate eastern third of the Project vicinity also is within a winter concentration area (NDIS 2012). The Project vicinity is not within or near any identified mule deer summer concentration areas (NDIS 2012). CPW definitions for mule deer ranges are the same as those provided for elk in the previous section.

Based on CPW range mapping, mule deer may be found in the Project vicinity at any time of the year, and higher numbers are likely to occur at the far west end and in the eastern third of the Project vicinity during winter months. Although all five of the vegetation types present within the Project vicinity and discussed in Section 3.7.1, General Vegetation, provide suitable habitat for mule deer, the specific use of these habitats can vary depending on the seasonal availability of forage and cover. Field surveys indicated that vegetation types (grassland/forb meadows, shrublands, and aspen) providing high-quality forage within the analysis area. There are areas of open mature pine forest and grassland/meadow and riparian areas along Solitude Creek and the North Fork Little Thompson River. These vegetation types also are common on the private parcels located between National Forest System lands. Forage also is present within forested stands in the form of shrubs, grasses, and herbaceous species, but less so in cover types other than open mature and sapling/pole stands, which are not present in the analysis area. The mix of habitat types in the general area provides moderate to high quality mule deer habitat.

3.9.1.3 Moose

The Project vicinity is within the Big Thompson River Basin and is located within the DAU M-99, Game Management Unit 20. Currently there are no moose population estimates for DAU M-99. According to NDIS (2012) mapping, the western half of the Project vicinity (west of structure numbers 7-5, North Line and South Line) is in moose overall and winter range. CPW definitions of moose overall and winter range are the same as those described for elk. Although all five of the vegetation types present within the Project vicinity and discussed in Section 3.7.1 General Vegetation, provide suitable habitat for moose, these vegetation types do not represent the preferred habitat of local populations. As a result of this, it is likely that moose may occasionally move through the Project vicinity but are not likely to be common since preferred aquatic and willow foraging habitats within the Project vicinity are essentially lacking.

3.9.1.4 Black Bear

Black bears are omnivorous but feed primarily on herbaceous vegetation and berries. Riparian, wetland, and other habitats along the perennial drainages area may represent some of the more important habitats for black bear in the Project vicinity. The entire Project vicinity is located in black bear overall range (NDIS 2012) and all five of the existing vegetation types discussed in Section 3.7.1, General Vegetation, provide suitable habitat for black bear . Overall range is defined by the CPW as the area that encompasses all known seasonal activity areas within the observed range of a population of black bear. The far west portions of the Project vicinity (west of pole structure 2-6 on North Line and pole structure 3-5 on South Line) are identified as black bear summer and fall concentration areas (NDIS 2012). Summer concentration areas are defined by the CPW as that portion of the overall range of the species where activity is greater than the surrounding overall range during that period from June 15 to August 15. Fall concentration areas are defined by the CPW as that portion of the overall range occupied from August 15 until September 30 for the purpose of ingesting large quantities of mast and berries to establish fat reserves for the winter hibernation period.

3.9.1.5 Mountain Lion

The Project vicinity is located within mountain lion overall range (NDIS 2012). Overall range is defined by the CPW as the area that encompasses all known activity areas within the observed range of a mountain lion population. Mountain lion occur throughout all five of the existing vegetation types occurring within the Project vicinity as discussed in Section 3.7.1, General Vegetation. A major habitat requirement is the presence of deer (Armstrong et al. 2011), and mountain lion movement is closely related to their principal prey, deer and other ungulates. Preferred habitat of mountain lions consists of rough or steep terrain in remote areas with suitable rock or vegetation cover. They are typically shy and avoid areas with human activity. Mountain lion, like their prey, are typically wide-ranging. They follow their prey's seasonal movement and inhabit summer range or winter range in conjunction with deer. As a result of their wide-ranging habits, population densities are usually low.

3.9.2 Other Mammals

Based on known ranges and habitat preferences, a variety of mammalian predators and small mammal species, including bats, are likely to be present in the Project vicinity. Most of these species are relatively widespread and common. The USFS listed sensitive species potentially occurring in the Project vicinity, and other mammalian species of concern are addressed in Section 3.10.

3.9.3 Upland Game Birds

Merriam’s wild turkey (*Meleagris gallopavo*), dusky grouse (*Dendragapus obscurus*), mourning dove (*Zenaida macroura*), and band-tailed pigeon (*Columba fasciata*) are upland game birds potentially occurring within the Project vicinity.

Preferred habitats for the native Merriam’s wild turkey in Colorado include primarily lower elevation (below 8,000 feet) ponderosa pine woodlands, oak brush, and riparian woodlands intermixed with grassland and brushy draws (Boyle 1998a). Ponderosa pine woodlands in the Project vicinity represent suitable habitat for wild turkey. The Project vicinity is located in wild turkey overall range (NDIS 2012) and a portion (structure numbers 7-4 to 9-4, North Line and 7-5 to 9-6, South Line) of the Project vicinity is within a wild turkey production area (NDIS 2012). The Project vicinity does not include wild turkey winter range or winter concentration areas (NDIS 2012). Overall range is defined by the CPW as the area that encompasses all known seasonal activity areas within the observed range of a wild turkey population. Wild turkey production areas are defined by the CPW as those area(s) that are used by turkeys for nesting during the period from March 15 to August 15.

Dusky grouse (formerly known as blue grouse) are a year-round resident and breed from the foothills to timberline and within the Project vicinity, inhabit the following vegetation types; mixed conifer forest, areas of mountain shrub mosaic, upland meadow edges, and open mountain-park meadows. They tend to prefer edge areas between woodlands and open herbaceous habitats as well as open-canopied woodlands with shrub understories (Toolen 1998).

Band-tailed pigeons are summer residents in Colorado that winter in Mexico and South America. In Colorado they prefer ponderosa pine, piñon pine, and oak brush habitats, and are found at the highest densities between 6,000 and 9,000 feet in elevation (Dexter 1998). Band-tailed pigeons are most common on the western slope of Colorado, but breeding also has been documented in western Larimer County (Dexter 1998). Band-tailed pigeons may occur in the Project vicinity throughout ponderosa pine woodlands, although none were recorded by field surveys.

Mourning doves occur nearly statewide in Colorado except at higher elevation and densely forested habitats. They inhabit shrubland and grassland habitats in the region. However, they prefer agricultural areas, riparian areas, and open woodlands with scattered trees and shrubs near water (Kuenning1998). They nest on horizontal branches of trees and on the ground. Within the Project vicinity, mourning doves are likely to occur in more open habitats near water east of the Pole Hill portion of the Project vicinity. This species migrates to warmer climates in the southern U.S. and Mexico for the winter.

3.9.4 Raptors

Raptors are protected under state and Federal laws including the MBTA and the Bald and Golden Eagle Protection Act. Bald eagle and peregrine falcon are discussed more specifically in Section 3.10. A variety of raptor habitats are within the Project vicinity, from lower elevation grassland and shrublands to montane shrublands and forests. As a result, there are a variety of raptor species likely to hunt and breed in the area. Open-country raptors likely to occur near the Project include golden eagle (*Aquila chrysaetos*), turkey vulture (*Cathartes aura*), northern harrier (*Circus cyaneus*), red-tailed hawk (*Buteo jamaicensis*), American kestrel (*Falco sparverius*), and prairie falcon (*Falco mexicanus*). Suitable hunting habitat for these species is present primarily east of the Pole Hill section of the Project.

Species closely associated with open water and riparian habitats are osprey (*Pandion haliaetus*), bald eagle (*Haliaeetus leucocephalus*), and peregrine falcon (*Falco peregrinous*). Suitable open water and riparian habitats are restricted to Flatiron Reservoir, Pinewood Reservoir, Big Thompson River, and Lake Estes within and near the Project vicinity. Peregrine falcon and bald eagle are state species of special concern and are discussed in Section 3.10. Common montane forest or forest edge dwelling species include Cooper's hawk (*Accipiter cooperii*), sharp-shinned hawk (*Accipiter striatus*), northern goshawk (*Accipiter gentilis*), great horned owl (*Bubo virginianus*), long-eared owl (*Asio otus*), flammulated owl (*Otus flammeolus*), northern pygmy-owl (*Glaucidium gnoma*), and northern saw-whet owl (*Aegolius acadicus*). Suitable habitat for these species is located in the Project area primarily west of the Pole Hill area.

In the Project vicinity, osprey, golden eagle, red-tailed hawk, northern goshawk, and great horned owl typically nest in relatively large trees with open crowns. Ospreys require trees along major rivers, lakes, and reservoirs. Osprey also will nest on power poles, artificial platforms, and other man-made structures. All but northern goshawk and osprey also may nest on rock ledges on cliffs and rock outcrops. Suitably-sized nest trees generally are lacking in the Project vicinity except for cottonwoods around Flatiron Reservoir. Human presence and recreation would likely preclude nesting near the shoreline portions of reservoirs near the Project vicinity. An osprey nest has been documented on an artificial pole platform near the south end of Pinewood Reservoir and the Project vicinity. Historically, the nest site has been active for several years and produced three chicks in 2011 (Larimer County 2011). No other large raptor tree nests were located during field surveys.

Northern goshawks typically nest in mature to old-growth stands of aspen, ponderosa pine, and lodgepole pine. Ponderosa pine and mixed conifer woodlands in the Project vicinity represent potential nesting habitat for northern goshawk, and Canyon Lakes Ranger District file data indicate there is one historic and one recently active nest site in the vicinity of the Project vicinity (Oberlag 2011). However, most conifer trees within and adjacent to the Project vicinity were judged to be relatively small and lacked suitable configurations to support goshawk nest construction. This species is discussed in greater detail in the Estes-Flatiron Biological Report (Cedar Creek Associates 2014).

Prairie falcons nest on ledges and in rock cavities on cliff faces. Suitable cliff face nesting habitat generally is lacking for this species in the Project vicinity. No prairie falcon nesting activity has been documented within the Project vicinity (Spowart 2012).

The American kestrel is a cavity nester, and abandoned woodpecker holes are used as nest sites. American kestrel inhabits a variety of open and wooded habitats and avoids densely forested habitats. Suitable habitat for this species occurs primarily to the east of the Pole Hill section of the Project. American kestrel was observed during the July 2011 field survey near Flatiron Reservoir and likely nests in the cottonwoods around the perimeter of the reservoir.

Northern harriers nest on the ground in low shrubs or in pockets of dense shrub and grass cover, often near wetlands. Other preferred habitats include native and non-native grasslands, agricultural areas, and marshes (Carter 1998). Suitable nesting habitats exist within the lower elevation portions of the Project vicinity east of the Pole Hill area, but they were not observed during the July 2011 field survey.

Cooper's hawk nests in aspen or in deciduous trees in riparian situations but also is known to nest in mature conifers (Ehrlich et al. 1988; Terres 1980). Nests are typically constructed in an upper crotch of a tree near the trunk and below the canopy top. Sharp-shinned hawks, unlike the Cooper's hawk, nest in a wide variety of wooded habitats ranging from mountain mahogany stands to conifers. Both species are potential nesters in the ponderosa pine woodlands within the Project vicinity, but no nests were located during field surveys.

Long-eared owls, like great horned owl, do not build their own nest and usually occupy abandoned magpie, hawk, crow, or squirrel nests in tall shrubs or trees (Ehrlich et al. 1998). Although primarily an open-country hunter, long-eared owls typically nest in juniper thickets, woodland perimeters, edges of riparian woodlands and at forest edges near water or moist meadow habitats (Terres 1980). Of the existing vegetation types discussed in Section 3.7.1, General Vegetation, ponderosa pine woodland edges, mountain shrub mosaic, and upland meadow/wetland mosaic vegetation types represent suitable nesting habitat for long-eared owl in the Project vicinity.

Flammulated owl, northern pygmy-owl, and northern saw-whet owl are all cavity-nesting, coniferous forest dwelling species. The flammulated owl is considered a common summer resident in the foothills and lower mountains of Colorado (Andrews and Righter 1992). Preferred habitat in Colorado consists of open, mature stands of Douglas-fir and ponderosa pine (Reynolds and Linkhart 1987). Old growth (greater than 200 years) or mature (greater than150 years) stands of ponderosa pine and ponderosa/Douglas-fir forests, often mixed with mature aspen, are preferred as nesting habitat (Jones 1991; Rashid 2009; Reynolds and Linkhart 1987). Ponderosa pine woodland within the Project vicinity is comprised of relatively young-age class trees with a closed-canopy structure and does not represent preferred habitat for flammulated owl. However, USFS flammulated owl surveys for a fuels reduction Project in forested areas north of the Project vicinity had several flammulated owl detections (Oberlag 2011); therefore, this species may be present in the Project vicinity. This species is addressed in greater detail in the Estes-Flatiron Biological Report (Cedar Creek Associates 2014).

Northern pygmy-owls are year-round residents in Colorado, but probably exhibit some elevation movements over the seasons (Jones 1998a). Nest sites have been found from the lower foothills to the upper montane zone (Jones 1998a). Preferred breeding habitat in Colorado appears to be areas that include a mixture of pine, spruce, fir, and aspen with nearby meadows and a water source such as a creek or pond (Rashid 2009). Northern saw-whet owls also are year-round residents in Colorado that also exhibit some elevation movement in response to the seasons (Rashid 2009). The species is relatively widespread in Colorado and prefers old-growth piñon-juniper and ponderosa pine habitats (Boyle 1998b). They can be found nesting in the same higher elevation habitats and areas used by northern pygmy-owls (Rashid 2009). Areas with larger and more mature trees are more likely to provide cavities for nesting for these species. Both species are potential breeders in the Project vicinity, although the general lack of mature stands may limit suitable nesting habitat.

3.9.5 Other Birds

A number of songbird and other bird species also may occur within the Project vicinity, which include open-country species associated with grassland and shrubland habitats and woodland species associated with coniferous forests. The majority of these avian species are migratory and occur only as summer residents within the Project vicinity. Many of the summer residents are neotropical migrants that winter in Central and South America.

The MBTA provides Federal legal protection for bird species listed at 50 CFR 10.13. In accordance with EO 13186, Responsibilities of Federal Agencies to Protect Migratory Birds (January 10, 2001), the USFS has agreed to a Memorandum of Understanding with the USFWS to promote migratory bird conservation (FS Agreement #08-MU-1113-2400-264). Under this Memorandum of Understanding, the USFS has committed to focus its evaluation the effects of agency actions on those species of management concern along with their priority habitats. The USFWS places the highest management priority on the Birds of Conservation Concern (BCC) list (USFWS 2008). The BCC list was developed as a 1988 amendment to the Fish and Wildlife Conservation Act. This Act mandated that the USFWS “identify species, subspecies, and populations of all migratory nongame birds that, without additional conservation actions, are likely to become candidates for listing under the ESA of 1973.” The goal of the BCC list is to prevent or remove the need for additional ESA bird listings by implementing proactive management and conservation actions.

The habitats and ranges of the BCC for the Southern Rockies/Colorado Plateau (Bird Conservation Region 16) (USFWS 2008) were reviewed to create a list of BCC potentially occurring in the Project vicinity. Potential BCC breeding bird populations within the Project vicinity include bald eagle, golden eagle, peregrine falcon, prairie falcon, flammulated owl, Lewis’s woodpecker (*Melanerpes lewis*), and Cassin’s finch (*Carpodacus cassinii*). The remaining species on the BCC list for Southern Rockies/Colorado Plateau either has ranges outside of the vicinity, prefer habitats not found in the vicinity, or occur only as migrants in the area during spring and fall migration. Golden eagle, prairie falcon, and flammulated owl are discussed in Section 3.9.4. Bald eagle and peregrine falcon are discussed in Section 3.10.

Lewis's woodpecker occurs as a summer resident in northern Colorado and is present in southern portions of the state, as well as northern New Mexico and Arizona, as a year-round resident and winter visitor. This species distribution closely matches that of ponderosa pine in the western U.S. (Abele et al. 2004). Breeding occurs most often in open forests or woodlands including park-like stands of ponderosa pine, riparian cottonwoods, and burned or logged conifer forest. In northern Colorado they breed from the northeast limit of Larimer County south along the Front Range to Denver (Andrews and Righter 1992).

Ponderosa pine woodlands and mixed conifer forests in the Project vicinity may represent potential breeding and foraging habitat for Lewis’s woodpecker, but canopy cover in most forested portions of the Project vicinity was estimated to be in excess of 30 percent. In addition, most tree stands are relatively young and larger, decadent trees (suitable for cavity excavation) are not prevalent within the Project vicinity. Therefore, habitat for Lewis’s woodpecker in the Project vicinity was judged to be marginal, and this species potential for occurrence is low. No Lewis’s woodpeckers were observed during the 2011 field surveys in the Project vicinity. In the future, habitat conditions for Lewis’s woodpecker in the Project vicinity may become more favorable as the mountain pine beetle epidemic continues to create dead and decaying trees and more open canopy conditions as dead trees fall.

Cassin’s finch is a year-round resident in Colorado that breeds in higher-elevation (8,000 to 11,000 feet) coniferous forest habitats (Winn 1998). It winters in similar habitats, but usually at lower elevations. Although the majority of breeding birds are found in association with upper montane and subalpine spruce-fir, lodgepole and ponderosa pine forests, breeding populations also have been located in piñon-juniper, aspen, and riparian (narrowleaf cottonwood, *Populus angustifolia*) woodlands, as well as high-country towns (Winn 1998). Cassin’s finches nest colonially, and nests are typically placed near the end of large tree branches. Cassin’s finch is a possible breeder in the ponderosa pine woodlands within the Project vicinity, but none were observed during the 2011 field surveys.

3.9.6 Amphibians and Reptiles

Common species potentially occurring within the Project vicinity include the western chorus frog (*Pseudacris triseri*), Woodhouse’s toad (*Bufo woodhousii*), and the tiger salamander (*Ambystoma tigrinum*). The majority of common amphibians and reptile species found in Colorado have life history requirements linked to the presence of aquatic habitats for breeding and feeding activities. Discussion of the availability of aquatic habitats located within the Project vicinity is provided in the introductory discussion of section 3.9 above. A detailed list of stream crossings by alternative is provided in **Table 3.5-2**. The three special status species potentially occurring within the Project vicinity are discussed in Section 3.10 below.

3.10 Special Status and Sensitive Wildlife Species

Federal and state-listed species in the analysis area, as well as USFS sensitive species potentially occurring on National Forest System lands crossed by the existing transmission line ROWs are addressed in the following sections. Lists of species with the potential to occur within the Project vicinity are included in **Table 3.10-1**.

The assessments are based upon information obtained from several sources: (1) published literature, (2) unpublished agency reports and data, (3) the USFWS Information, Planning, and Conservation (IPaC) system, (4) CNHP database search, and (5) field surveys. The CNHP database search for threatened, endangered, and proposed species was requested for a 1-mile corridor on each side of all ROWs. Results of the CNHP database search request were received on November 18, 2011. A more detailed request was submitted for the National Forest parcels crossed. The specifics of the request for National Forest land and the results of this request are provided in the Biological Report submitted to the Arapahoe-Roosevelt National Forest for the National Forest portions of the Project area. In addition, Western prepared and submitted a Biological Assessment (BA) under Section 7 of the ESA to the USFWS on November 9, 2017. Concurrence from the USFWS on the species analyzed within the BA was received on November 14, 2017.

3.10.1 Federal Threatened, Endangered, Proposed, and Candidate Species

An official USFWS, Colorado Ecological Services species list for the Estes-Flatiron Transmission Line Rebuild Project in Larimer County was requested and received from the USFWS on-line Information, Planning, and Conservation decision support system on December 6, 2011, December 10, 2013, and July 27, 2017 to check for updates. This list is provided in **Table 3.10-1**. Of the 11 federally listed threatened, endangered, proposed, or candidate wildlife species identified in this list, three have potential to occur within the Project area. They include the Preble's meadow jumping mouse *(Zapus hudsonius preblei)*, Mexican spotted owl *(Strix occidentalis lucida)*, and the Arapahoe snowfly (*Capria arapahoe*). The Arapahoe snowfly is a Forest Service Sensitive Species and is discussed further under Section 3.10.3.

3.10.1.1 Preble's Meadow Jumping Mouse

The Preble's meadow jumping mouse is a small rodent that inhabits well-developed riparian habitat with adjacent relatively undisturbed grassland communities near water. This species prefers streamside habitats with structural diversity, including a dense herbaceous understory, shrubs, and trees (68 FR 37276). Preble's habitat is considered up to 300 feet from the 100 year floodplain which may include upland habitat. No known occurrence of Preble's meadow jumping mouse exists for the Project area. Surveys for the species within the region have occurred historically at Flatiron Reservoir, Pole Hill Reservoir, Pinewood Reservoir, Chimney Hollow Reservoir, and Dry Creek Reservoir from 2000 to 2008 (USFWS 2012a). The 2008 and 2009 trapping surveys at Flatiron Reservoir did locate a population. However the segments of transmission line to be constructed/deconstructed are over 700 feet from the reservoir and separated by the Bureau of Reclamation facility and paved development. All other locations produced negative results. The Project area lacks preferred habitats of this species. Marginally suitable habitat exists along North Fork Little Thompson River, but this portion of the Project area is above the upper elevation limit (7,600 feet amsl) of this species and is not known to be occupied.

3.10.1.2 Mexican Spotted Owl

The Mexican spotted owl typically occupies old growth forest in mixed conifer, pine-oak woodland, deciduous riparian forest, canyons, or a combination of these habitats that will support a home range of 1,400 to 4,500 acres (Ehrlich et al. 1988; Gutiérrez et al. 1995). Mexican spotted owls exhibit high nest fidelity and utilize nests in rock crevices, tree cavities (usually in live trees) or on constructed platforms on tree limbs. An undisturbed core area or protected activity center (PAC) of approximately 600 acres, centered on the nest site, is the currently recommended disturbance buffer (Gutiérrez et al. 1995).

Occurrence of Mexican spotted owls within the Project area would be limited to foraging or transient individuals if present. Suitable nesting habitat or PACs are not present within the Project area. Given the variety of prey taken by Mexican spotted owls, foraging habitat is present within forested stands, edges, and meadows. The most likely areas for foraging are mature stands of ponderosa pine and Douglas fir. Although there is some potential for Mexican spotted owls to occur in canyons in the vicinity of the Project, correspondence with the USFS indicates the canyons in the Project area are not suitable habitat and do not contain the typical habitat requirements. Additionally, historic sightings of Mexican spotted owls in the Boulder and Canyon Lakes Districts are very old (D. Oberlag, Personal Correspondence July 12, 2017). The Colorado Natural History Program Database shows no historic Mexican Spotted Owl observations within 4 miles of the project boundaries (CNHP 2017).

Audio surveys for Mexican spotted owls and suitable habitat surveys on the Arapaho National Forest (ARNF) was conducted in 1994 and no vocalizations of Mexican spotted owls were detected (USFS 2007). Intensive audio surveys were conducted in the eastern portion of Rocky Mountain National Park in 2007 and 2008 (Blakesley 2009). These surveys were just a few miles west of the Estes-Flatiron Project area and covered a great deal of the potentially available habitat for owls in the general area. As part of these surveys 393 point surveys of at least 10 minutes duration (4814 total survey minutes) were conducted at 211 locations. They surveyed 78% of the established broadcast locations on at least two occasions, separated by at least 7 days. These surveys resulted in no Mexican Spotted Owl detections.

Another EA completed in 2017 by the Federal Emergency Management Agency and Larimer County for the Hermit Park Open Space Area is immediately adjacent to the project area. This property is directly across Highway 36 from the project area and contains similar habitat. The EA found that no suitable habitat existed in that area for Mexican Spotted Owl (FEMA 2017). The EIS for the Windy Gap Firming Project (Chimney Hollow Reservoir) issued by the Bureau of Reclamation (USDI BOR 2014) found no suitable habitat for MSO in their study area, which coincides with the eastern portion of the Project.

The Arapahoe snowfly (*Capria arapahoe*) is currently a candidate for listing as threatened and endangered and is discussed further under Section 3.10.3, Forest Service Sensitive Species.

3.10.2 Colorado State Threatened, Endangered, and Special Concern Species

The State of Colorado list of threatened, endangered, and special concern species was reviewed on the CPW website (CPW 2017) to determine state-listed species with potential to occur in the analysis area. In addition, the CNHP database was searched for sensitive species occurrence within the analysis area (CNHP 2011). Based on species' ranges and habitat preferences, it was determined that nine state-listed species have potential to occur within or near the Project vicinity (**Table 3.10-1**).

3.10.2.1 Townsend's Big-eared Bat

Townsend's big-eared bat is widely distributed in Colorado except on the eastern plains (Armstrong et al. 2007). Occupied habitats include open montane forests, semi-desert shrublands, and piñon/juniper shrublands. These bats generally are solitary or gather in small groups. During the summer, females may form larger maternity colonies located in mines, caves, abandoned structures, and crevices in rock cliffs in woodlands and forests to elevations above 9,500 feet amsl (Adams 2003; Armstrong et al. 2007). Foraging occurs over water, along the margins of vegetation and over sagebrush. They are relatively sedentary and do not move long distances from hibernacula to summer roosts (Armstrong et al. 2011). Although all five of the vegetation types present within the Project vicinity, as discussed in Section 3.7.1, General Vegetation, provide suitable habitat for this species, the specific use of these habitats can vary depending on the seasonal availability of forage and cover, and the presence of open water.

Table 3.10-1 Special Status Species Occurrence

Common Name (Scientific Name)	USFWS Candidate Status	Colorado State Status	USFS Status	Management Indicator Community (MIC)	Potential Occurrence	Excluded from Further Analysis	Reason for Exclusion
Mammals							
American marten (*Martes americana)*			Sensitive		Yes	No	
Black-footed ferret *(Mustela nigripes)*	Endangered	Endangered			No	Yes	No suitable habitat in or near Project area.
Canada lynx *(Lynx Canadensis)*	Threatened	Endangered			No	Yes	The Project area is not within suitable habitat or a Lynx Analysis Unit.
Elk (*Cervus elaphus)*			MIS	Young to Mature Forest and Openings	Yes	No	
Fringed myotis (*Myotis thysanodes)*			Sensitive / MIS	Forest Openings	Yes	No	
Mule deer (*Odocoileus hemionus)*			MIS	Young to Mature Forest and Forest Openings	Yes	No	
Gray wolf (*Canis lupus irremotus*)	Endangered	Endangered			No	Yes	Project area is outside of current distribution.
North American wolverine Ψ (*Gulo gulo luscus*)	Proposed Threatened	Endangered			No	Yes	No occurrences or suitable habitat within the Project area.
White-tailed prairie dog (*Cynomys leucurus)*			Sensitive	No	No	Yes	
Preble's meadow jumping mouse *(Zapus hudsonius preblei)*	Threatened	Threatened			Yes	No	
Pygmy shrew (*Sorex hoyi montanus)*			Sensitive		No	Yes	No occurrences or suitable habitat within the Project area.

Table 3.10-1 Special Status Species Occurrence

Common Name (Scientific Name)	USFWS Candidate Status	Colorado State Status	USFS Status	Management Indicator Community (MIC)	Potential Occurrence	Excluded from Further Analysis	Reason for Exclusion
North American River Otter (*Lontra canadensis)*		Threatened	Sensitive		No	Yes	No occurrences or suitable habitat within the Project area.
Rocky Mountain bighorn sheep (*Ovis canadensis canadensis)*			Sensitive / MIS	Cliff and Canyons / Forest Openings	No	Yes	No occurrences or suitable habitat within the Project area.
Townsend's big-eared bat (*Corynorhinus townsendii pallescens*)		Special Concern	Sensitive		Yes	No	
Hoary bat *Lasiurus cinereus*			Sensitive		Yes	No	
Birds							
American peregrine falcon (*Falco peregrinus*)		Special Concern	Sensitive		Yes	No	
Bald eagle (*Haliaeetus leucocephalus*)		Special Concern	Sensitive		Yes	No	
Black swift (*Cypseloides niger)*			Sensitive		No	Yes	No occurrences or suitable habitat within the Project area.
Boreal owl (*Aegolius funereus)*			Sensitive		Yes	Yes	Suitable habitat, mature to old growth spruce/fir forest not present in Project area.
Flammulated owl (*Otus flammeolus)*			Sensitive		Yes	No	
Golden-crowned kinglet (*Regulus satrapa)*			MIS	Interior Forests	Yes	No	
Hairy woodpecker (*Picoides villosus)*			MIS	Young to Mature Forest	Yes	No	

Table 3.10-1 Special Status Species Occurrence

Common Name (Scientific Name)	USFWS Candidate Status	Colorado State Status	USFS Status	Management Indicator Community (MIC)	Potential Occurrence	Excluded from Further Analysis	Reason for Exclusion
Least tern *(Sterna antillarum)***	Endangered	Endangered			No Potential to Occur	Yes	No occurrences or suitable habitat within the Project area. No Project water depletions are anticipated.
Lewis's woodpecker (*Melanerpes lewis)*			Sensitive		Yes	No	
Mexican spotted owl *(Strix occidentalis lucida)*	Threatened	Threatened			Yes	No	
Mountain bluebird (*Sialia currucoides)*			MIS	Forest Openings	Yes	No	
Northern goshawk (*Accipiter gentilis)*			Sensitive		Yes	No	
Northern harrier (*Circus cyaneus)*			Sensitive		No	Yes	
Cassin's sparrow (*Aimophia cassini*)			Sensitive		No	Yes	Suitable habitat not present in Project area.
Grasshopper sparrow (*Ammodramus savannarum*)			Sensitive		No	Yes	Outside documented range of occurrence.
Brewer's sparrow (*Spizella* breweri)			Sensitive		No	Yes	Suitable nesting habitat is not present within Project area.
Olive-sided flycatcher (*Contopus borealis)*			Sensitive		Yes	No	No occurrences or suitable habitat within the Project area.
Piping plover *(Charadrius melodus)* **	Threatened	Threatened			No	Yes	No occurrences or suitable habitat within the Project area. No Project water depletions are anticipated.
Purple martin (*Progne subis)*			Sensitive		No	Yes	No occurrences or suitable habitat within the Project area.

Table 3.10-1 Special Status Species Occurrence

Common Name (Scientific Name)	USFWS Candidate Status	Colorado State Status	USFS Status	Management Indicator Community (MIC)	Potential Occurrence	Excluded from Further Analysis	Reason for Exclusion
Pygmy nuthatch (*Sitta pygmaea)*			MIS	Aspen Forest	Yes	No	
Warbling vireo (*Vireo gilvus)*			MIS	Montane Riparian and Wetlands	No	Yes	No occurrences or suitable habitat within the Project area.
White-tailed ptarmigan (*Lagopus leucurus)*			Sensitive		No	Yes	No occurrences or suitable habitat within the Project area.
Whooping crane *(Grus americana)***	Endangered	Endangered			No	Yes	No occurrences or suitable habitat within the Project area. No Project water depletions are anticipated.
Wilson's warbler (*Wilsonia pusilla)*			MIS	Montane Riparian and Wetlands	Yes	No	
Amphibians and Reptiles							
Boreal toad (*Bufo boreas boreas*)		Endangered	Sensitive / MIS	Montane riparian & wetlands	Yes	No	
Common garter snake (*Thamnophis sirtalis*)		Special Concern			Yes	No	
Northern leopard frog (*Rana pipiens*)		Special Concern	Sensitive		Yes	No	
Wood frog (*Rana sylvatica)*			Sensitive		No	Yes	Project area is outside of current distribution.
Fishes							
Greenback cutthroat trout *(Oncorhynchus clarki stomias*)	Threatened	Threatened			No	Yes	No suitable habitat in or near Project area.

Table 3.10-1 Special Status Species Occurrence

Common Name (Scientific Name)	USFWS Candidate Status	Colorado State Status	USFS Status	Management Indicator Community (MIC)	Potential Occurrence	Excluded from Further Analysis	Reason for Exclusion
Pallid sturgeon *(Scaphirhynchus albus)***	Threatened				No	Yes	No water depletions will occur with Project.
Invertebrates							
Arapahoe snowfly (*Capria arapahoe*)			Sensitive		Yes	No	
Hudsonian emerald dragonfly (*Somatochlora hudsonica)*			Sensitive		Yes	No	
Rocky Mountain capshell (*Acroloxus coloradensis*)		Special Concern			No	Yes	No suitable habitat in or near Project area.

**Species not present in or near Project vicinity but water depletions may affect these downstream species.

Ψ These species are suspected to occur but unconfirmed on the Roosevelt National Forest.

Source: CNHP 2011; CPW 2017; USFWS 2011, 2013b; USFS 2013a.

There are no open mine shafts and caves or abandoned buildings that might provide hibernacula, maternity sites, or roosts for Townsend's big-eared bat within or near the Project vicinity. The only suitable habitat in the Project vicinity would be possible foraging habitat, especially where stream courses cross the ROW.

3.10.2.2 Bald Eagle

Within the Project vicinity, suitable nest trees generally are lacking around all but Flatiron Reservoir, and human presence and recreation would likely preclude nesting near the shoreline of this reservoir. No large raptor tree nests were located during field surveys, and no bald eagle nests are known to be present in or near the Project vicinity (Cedar Creek Associates 2014).

3.10.2.3 American Peregrine Falcon

In Colorado, peregrine falcons are relatively rare spring and fall migrants in western valleys, foothills, lower elevation mountains, and mountain parks, and a rare winter visitor to western valleys (Andrews and Righter 1992). These raptors also are rare summer residents in the foothills and lower elevation mountains. Migration and/or wintering habitat includes wildlife (waterfowl) refuges or other habitats that concentrate prey species.

There is no suitable nesting habitat within the Project vicinity. However, a known peregrine falcon eyrie exists within the general area of the Project vicinity (Cedar Creek Associates 2014). The nest site is located north of the existing line, and peregrine falcons likely hunt waterfowl in the Lake Estes area. The Project vicinity is within the hunting territory of this nesting pair since falcons have been found to range as far as 17 miles from an eyrie during hunting forays (USFWS 1984).

3.10.2.4 Boreal Toad

Boreal toad also is a USFS Sensitive Species and MIS. Suitable habitat for boreal toad within the Project vicinity is restricted to the upland meadow/wetland mosaic habitats and open water associated with Solitude Creek (Cedar Creek Associates 2014). Boreal toads could inhabit both drainages, but shallow, still water areas suitable for breeding habitat generally are not present where the ROWs cross Solitude Creek. However, available evidence indicates that female boreal toads may disperse over greater distances and into drier habitats than males (Loeffler 2001). Studies of boreal toads by the CPW indicate that male toads remain within 300 meters of breeding sites, while females can move up to three to four miles from breeding areas (Jones 1999). Upland habitats for both boreal toad males and females include aspen and conifer habitats with rocky areas or ground squirrel holes where toads seek refuge in rock crevices or rodent burrows to avoid temperature extremes and desiccation.

3.10.2.5 Northern Leopard Frog

The northern leopard frog occurs in Colorado in a variety of wetland habitats, which provide relatively fresh water with moderate salinity, including springs, slow streams, marshes, bogs, ponds, canals, flood plains, beaver ponds, reservoirs, and lakes, usually in permanent water with rooted aquatic vegetation (Hammerson 1999; Smith and Keinath 2007). Northern leopard frogs are a highly aquatic species and are usually found in close association with the banks and shallow water areas of permanent marshes, ponds, streams, lakes, and reservoirs. Water bodies with rooted aquatic vegetation are preferred, although adult frogs can disperse into moist, grassy meadows away from aquatic habitat to forage during the summer months (Hammerson 1999). Suitable habitat may exist for northern leopard frog along the North Fork of the Little Thompson River, Solitude Creek, and ponds located on private lands associated with these two perennial streams (Cedar Creek Associates 2014). Other areas of suitable habitat may occur in upland meadow/wetland mosaic habitats around the perimeters of Flatiron Reservoir, Pinewood Reservoir, and Lake Estes.

3.10.2.6 Common Garter Snake

In Colorado the common garter snake inhabits marshes, ponds, and edges of streams and is usually associated with aquatic, wetland, and riparian habitats along the floodplains of streams. It is seldom found far from water (Hammerson 1999). Its distribution in Colorado includes the South Platte River and its tributaries at elevations below 6,000 feet amsl (Hammerson 1999). Possible suitable, but marginal, habitat for this species below 6,000 feet amsl within or near the Project vicinity is restricted to the upland meadow/wetland mosaic habitats located at the perimeters of Pinewood Reservoir and Flatiron Reservoir.

3.10.3 Forest Service Sensitive Species and Management Indicator Species (MIS)

Table 3.10-1 presents 23 wildlife species, which are listed as sensitive by the USFS. Species that do not have suitable habitat present within the Project vicinity are excluded from further analysis.

MIS are designated by the USFS as indicators of the health of selected ecosystems or associated habitats. Through monitoring population and habitat relationships of MIS, the effects of management activities on invertebrate, fish, plant, and wildlife species can be evaluated. MIS are selected based on five criteria: (1) a strong, yet not exclusive affinity for vegetation type; (2) a life cycle keyed to a specific vegetation type; (3) sensitivity to habitat change; (4) relative ease of monitoring; and (5) somewhat representative of other species that utilize the same vegetation types. The 11 wildlife species considered MIS for actions within the Roosevelt National Forest are presented in **Table 3.10-1**. Species that do not have suitable habitat present within the Project vicinity are excluded from further analysis.

3.10.3.1 American Marten

Mature spruce-fir and lodgepole forests habitats preferred by American marten are not present within the analysis area, and their presence within the analysis area is unlikely. There is a low probability that wandering individuals may pass through the analysis area moving from higher valued habitats during the summer months but optimal foraging habitat is not present because of the predominately small size class of the forest within the analysis area.

3.10.3.2 Pygmy Shrew

Suitable habitat, including upper montane or subalpine landscapes dominated by conifer forest and dense stream networks that interact with various bogs, marshes, and other wetlands (Beauvais and McCumber 2006), is not present in the Project area.

3.10.3.3 North American River Otter

Suitable river habitat is not present in Project area.

3.10.3.4 Fringed Myotis

The fringed myotis also is a MIS. It is found in western North America, occurring from southern British Columbia, Canada south through southern Mexico (Keinath 2004). It occurs west to the Pacific coast and east to the Rocky Mountains, with a potentially isolated population in the Black Hills of South Dakota, Wyoming, and Nebraska. Occurrences have been documented in 14 states (Arizona, California, Colorado, Idaho, Nebraska, New Mexico, Montana, Nevada, Oregon, South Dakota, Texas, Utah, Washington, and Wyoming).

Fringed myotis appear to use a fairly broad range of habitats. The most common habitats in which this species has been found are oak, piñon, and juniper woodlands or ponderosa pine forest at middle elevations. They also appear to use deserts, grasslands, and other types of woodlands (Keinath 2004). Although all five of the vegetation types present within the Project vicinity, as discussed in Section 3.7.1, General Vegetation, provide suitable foraging habitat for this species, suitable roosting sites are a critical habitat component, the availability of which can determine population sizes and distributions. There appears to be considerable variation in roost selection by fringed myotis. The pattern of this variation and its underlying causes are unclear. It likely results from a combination of factors, including the relative quality and availability of different roost types, the habitat structure surrounding roosts, prevailing environmental factors (e.g., temperature, wind), proximity to water and foraging areas, and predator avoidance (Keinath 2004).

The analysis area is near or above the upper elevational distribution of fringed myotis, and there are no open mine shafts, caves, or abandoned buildings that potentially provide hibernacula or maternity sites for fringed myotis within or near the analysis area (Cedar Creek Associates 2014). The predominance of younger age class trees in the analysis area also does not create many opportunities for suitable tree roost sites. Areas of rock outcrop in Pole Hill portion of the analysis area may provide suitable day roost sites for individuals. The remainder of the analysis area would only be used as foraging habitat.

There are several know detections of fringed myotis within the Canyon Lakes Ranger District.

3.10.3.5 Townsend's Big-eared Bat

The Townsend's big-eared bat is described in Section 3.10.2.1.

3.10.3.6 Hoary Bat

The hoary bat is the most widespread of all North American bats, occurring throughout North America. They are highly associated with forested habitats in the West. In the Rocky Mountain States it has been found in juniper scrub, riparian forests, Douglas-fir and ponderosa pine forests, and open desert habitats (Adams 2003; Fitzgerald et al. 1994) and up to elevations of 10,000 feet in Colorado (Fitzgerald et al. 1994). Hoary bats are solitary and roost primarily in foliage of both coniferous and deciduous trees near the ends of branches, 3 to 12 meters above the ground. This species never seems to be abundant in any area and most collections are of single individuals. Hoary bats are migratory and only occur in Colorado during the summer months. They winter in the southern U.S. and Central and South America. Loss of roosting habitat due to timber harvest is likely the biggest threat to this species (Ellison et al. 2004; Fitzgerald et al. 1994). Locally, wildfire and the current mountain pine beetle epidemic may pose as bigger threats to this species habitat.

Ponderosa pine and mixed conifer woodlands in the analysis area could be used by hoary bat for foraging and roosting. Individual females also could use larger trees in these habitats as maternity sites during the summer months. Because of Western's vegetation maintenance activities, trees within the existing managed portion of ROWs are likely too small to provide suitable roost or maternity sites, but mature trees in the expanded ROW may provide suitable roost or maternity sites.

3.10.3.7 American Peregrine Falcon

The American peregrine falcon is described in Section 3.10.2.3.

3.10.3.8 Bald Eagle

The bald eagle is described in Section 3.10.2.2.

3.10.3.9 Boreal Owl

Considered imperiled in Colorado, boreal owls occupy a circumpolar distribution in northern hemisphere boreal forests. In North America, boreal forests in Colorado and northern New Mexico delineate the southernmost extent of their distribution. Although boreal owls are considered globally secure, their trend is unknown due to unreliable population estimates and nomadism caused by fluctuations in prey base abundance and distribution (NatureServe Explorer 2012). Boreal owls appear to be distributed in Colorado between 9,200 and 10,400 feet amsl (Hayward and Verner 1994).

In Colorado, boreal owls utilize late-successional, multi-layered habitats of spruce-fir and lodgepole pine interspersed with meadows. These owls also may be found in aspen and mixed conifer stands. Boreal owls are secondary cavity nesters, usually occupying cavities excavated by woodpeckers. Nest cavities are commonly found in snags with a diameter of at least 10 inches and may be used in consecutive years. Suitable habitat within the Project vicinity is restricted to the ponderosa pine woodlands, mountain shrub mosaic, and mixed conifer vegetation types described in Section 3.7.1, General Vegetation.

3.10.3.10 Flammulated Owl

The flammulated owl occurs in western North America from southern Mexico and Guatemala north to southern British Columbia. It winters from central Mexico south to Guatemala and is found in the U.S. and Canada only from spring through fall. The flammulated owl is considered a common to uncommon summer resident in the foothills and lower mountains of Colorado (Andrews and Righter 1992). Flammulated owls arrive in Colorado in late April to early May and lay 2 to 3 eggs at the end of May and June. Young hatch in June and early July, and most young fledge by the end of July. Most owls migrate from Colorado by early October

These owls occur regularly from 6,000 to 10,000 feet elevation and prefer old growth or mature ponderosa pine. Key habitat features seem to be the presence of larger trees and snags, scattered clusters of shrubs or saplings, clearings, and a high abundance of nocturnal arthropod prey (Colorado Partners in Flight 2000). Preferred habitat in Colorado is open, mature stands of Douglas-fir and ponderosa pine (Reynolds and Linkhart 1987), and they are known to occupy these habitats in the Roosevelt National Forest (Hayward and Verner 1994). Old growth (>200 years) or mature (>150 years) stands of ponderosa pine and ponderosa/Douglas-fir forests, often mixed with mature aspen, are preferred as nesting habitat (Jones 1991; Reynolds and Linkhart 1987). Flammulated owls are obligate cavity nesters, and they nest in natural or woodpecker cavities. Nesting territories are relatively small. Linkhart (1984) reported a mean size of approximately 14 ha (34.6 acres) for a population in Colorado. USFS flammulated owl surveys for a fuels reduction Project in forested areas north of the analysis area had several flammulated owl detections (Oberlag 2011), and this species may be present in the analysis area.

3.10.3.11 Lewis's Woodpecker

Lewis's woodpecker occurs as a summer resident in northern Colorado and is present in southern portions of the state, as well as northern New Mexico and Arizona, as a year-round resident and winter visitor. This species distribution closely matches that of ponderosa pine in the western U.S. (Abele et al. 2004). Breeding occurs most often in open forests or woodlands including park-like stands of ponderosa pine, riparian cottonwoods, and burned or logged conifer forest. In northern Colorado they breed from the northeast limit of Larimer County south along the Front Range to Denver (Andrews and Righter 1992).

Ponderosa pine and mixed conifer forests in the Project area may represent potential breeding and foraging habitat for Lewis's woodpecker, but canopy cover in most forested portions of the Project area was estimated to be in excess of 30 percent. In addition, most tree stands are relatively young and larger, decadent trees (suitable for cavity excavation) are not prevalent within the Project area. Therefore, habitat for Lewis's woodpecker in the Project area was judged to be marginal, and this species potential for occurrence is low. No Lewis's woodpeckers were observed during the 2011 field surveys in the Project area. In the future, habitat conditions for Lewis's woodpecker in the Project area may become more favorable as the mountain pine beetle epidemic continues to create dead and decaying trees and more open canopy conditions as dead trees fall.

3.10.3.12 Northern Goshawk

Considered vulnerable in Colorado, the northern goshawk occurs throughout North America and circumpolar through Europe and Asia (NatureServe Explorer 2012). According to NatureServe Explorer (2012) and Kennedy (2003), trends are difficult to determine due to the lack of quantitative data and because of biases inherent in the various methods used to track avian populations. Christmas Bird Count data (1959-1988), North American Breeding Bird Survey (BBS) data (1966-1996), and counts of migrants in the eastern U.S. (1972-1987) do not indicate any changes in population size.

Ponderosa pine and mixed conifer woodlands in the analysis area represent potential nesting habitat for northern goshawk, although most conifer trees within and adjacent to the existing ROWs were judged to be relatively small and lacked suitable configurations to support goshawk nest construction. Aspen trees in the small pockets of aspen within the analysis area also were judged to be too small to support goshawk nesting activity. Loss of ponderosa, limber, and lodgepole pine trees from the mountain pine beetle epidemic may reduce the quality of potential goshawk nesting habitat in and near the analysis area in the next few years as beetle-killed trees die and dead trees fall, altering the character of existing woodland habitats. It also could increase habitat quality, particularly for goshawk foraging, as beetle mortality produces a forest thinning effect and increased snag densities may increase potential goshawk prey densities.

Canyon Lakes Ranger District file data indicate there are one historic and one recently active nest site in the vicinity of the existing ROWs (Oberlag 2011). The recently active site is approximately 1.4 miles from the nearest line and separated from the line by one or two ridges. The other site is approximately 0.65 mile from the nearest line but within the same drainage as the ROW. This site has not been active in several years, but it is possible a breeding pair of goshawks could be using an alternate nest site in the vicinity (Oberlag 2011).

3.10.3.13 Northern Harrier

Suitable habitat, including native and non-native grasslands, agricultural lands, marshes, and alpine tundra, is not present in the Project area.

3.10.3.14 Olive-sided Flycatcher

Considered vulnerable in Colorado and declining globally, olive-sided flycatcher breeding habitat occurs throughout the U.S. and Canada. Non-breeding territory occurs in central and South America. North American BBS data indicate declines since 1966 across much of North America. Many structural stages of forest may be used if large snags are present for perching and foraging. The olive-sided flycatcher's diet consists almost entirely of flying insects, particularly bees. Nests are placed most often in conifers on horizontal limbs from 5 to 30 feet above the ground. Olive-sided flycatchers will use openings, old burns, or clear-cuts for foraging habitat, as long as snags are present. BBS surveys found 84 percent of olive-sided flycatcher occurrences in coniferous forests (Jones 1998b).

In Colorado, olive-sided flycatchers breed in old growth coniferous forests from 7,000 to 11,000 feet (Jones1998b). Olive-sided flycatchers typically prefer higher elevation spruce-fir forest with openings and are not likely to be common within the analysis area. None were observed in the analysis area during field surveys. Linear openings created by the ROWs through forested habitat may serve to increase areas of suitable foraging habitat for olive-sided flycatcher. Although the lack of spruce-fir forest stands reduce the likelihood of its presence in the analysis area.

3.10.3.15 Purple Martin

The Project area is outside of known breeding range for the purple martin (Wiggins 2005).

3.10.3.16 Boreal Toad

The boreal toad is described in Section 3.10.2.4.

3.10.3.17 Northern Leopard Frog

The northern leopard frog is described in Section 3.10.2.5.

3.10.3.18 Arapahoe Snowfly

The Arapahoe snowfly is a small winter stonefly know from only two locations in Larimer County in north-central Colorado. It inhabits reaches of two small cool streams that are tributaries to the Cache la Poudre River. The species was first collected at Elkhorn Creek, 22 miles west of Fort Collins, at an elevation of 2,012 meters (6,600 feet). It also was found at Young Gulch above Ansel Watrous Campground in the Poudre Park area at an elevation of 1,768 m (5,800 feet) (Matheson et al. 2010). Young larvae undergo a period of inactivity (diapause) during the warm months, complete development during late fall and early winter, and the dark-colored adults emerge in late winter or early spring. This species' limited habitat is threatened with degradation and destruction from extensive recreational use and increasing development pressures in the two streams from which it is known. Research should focus on assessing and strengthening current management practices for existing habitat and evaluating the population size, distribution, and stability (Mazzacano 2016).

Suitable habitat for the Arapahoe snowfly within the analysis area is restricted to pebble, cobble, and bedrock substrate of Solitude Creek. Habitat is lacking at the E-PH crossing since this portion of the drainage is characterized by a relatively broad sedge dominated (fen) community with soils saturated to the surface but with minimal expression of open water at the surface. Suitable habitat may be present at the North Line crossing where flowing surface water is present within in a defined, narrow (1- to 2-foot) stream channel.

3.10.3.19 Hudsonian Emerald Dragonfly

The Hudsonian emerald dragonfly apparently is a rather uncommon species based on the infrequency of its occurrence in collections and known population locales. Although apparently widespread in Canada, occurrence records in the continental U.S. are restricted to seven locales in Colorado, possibly three in Wyoming, and one in Montana (Packauskas 2005). Its known distribution in Colorado is relatively localized and restricted to mountainous areas within a 40-mile radius of Boulder, Colorado, which may indicate it's been poorly collected in other possible habitats (Packauskas 2005). There is insufficient data to make any inferences regarding population trends of this species.

Suitable habitat for Hudsonian emerald within the analysis area is restricted to the boggy edges of flowing water associated in Solitude Creek. Habitat is lacking at the South Line crossing since this portion of the drainage is characterized by a relatively broad sedge dominated (fen) community with soils saturated to the surface but with minimal expression of open water at the surface. Suitable habitat may be present at the North Line crossing where flowing surface water is present within in a defined, narrow (1- to 2-foot) stream channel.

The Project area is outside of the known range of this species.

3.10.3.20 Elk

Elk are described in Section 3.9.1, Big Game Species.

3.10.3.21 Mule Deer

Mule deer are described in Section 3.9.1, Big Game Species.

3.10.3.22 Golden-crowned Kinglet

This kinglet species was never abundant in Colorado and most occur west of the Continental Divide (Roth and Potter 1998), so there is not a high likelihood of presence in the analysis area. Breeding habitat for the golden-crowned kinglet is coniferous forests. The species constructs open cup nests of moss, lichen, spider web, and bark strips, lined with feathers, fine grasses, plant down, lichens, and fur in a well-concealed hanging cup suspended from a conifer branch (Cornell Lab of Ornithology 2013). Breeding has been confirmed in Larimer County (Roth and Potter 1998), but this species was not detected during field surveys in the analysis area. It is not likely to be present because of the lack of spruce-fir forest and/or old-growth characteristics of conifer stands in the analysis area.

This kinglet species was never abundant in Colorado and most occur west of the Continental Divide (Roth and Potter 1998), so there is not a high likelihood of presence in the analysis area. Breeding has been confirmed in Larimer County (Roth and Potter 1998), but this species was not detected during field surveys in the analysis area (Cedar Creek Associates 2014). It is not likely to be present due to the lack of spruce-fir forest and/or old-growth characteristics of conifer stands in the Project area.

3.10.3.23 Hairy Woodpecker

The hairy woodpecker is secure in Colorado. The species inhabits mature forests, open woodlands, beaver ponds, urban areas, recently burned forests, and forests infested with bark beetles, typically up to 6,500 feet amsl. They forage along trunks and main branches of large trees. Across North America the hairy woodpecker can be found from sea level to high mountains. It is a year-round resident, but may migrate to lower elevations or coastal areas during winter (Cornell Lab of Ornithology 2013).

Ponderosa pine and mixed conifer forests within and adjacent to the ROW provide suitable habitat conditions for hairy woodpecker. Field surveys indicated that the age class of tree cover in the analysis area is relatively young, but does include mature conifer habitat and snags. No observations of this species were recorded by field surveys.

Suitable habitat within the Project vicinity is present across all of the vegetation types. Ponderosa pine and mixed conifer forests within and adjacent to the ROW provide suitable habitat conditions for hairy woodpecker as described in Section 3.7.1, General Vegetation. Field surveys indicated that the age class of tree cover in the analysis area is relatively young, but does include mature conifer habitat and snags (Cedar Creek Associates 2014).

3.10.3.24 Mountain Bluebird

The mountain bluebird is secure in Colorado (NatureServe Explorer 2012). The species inhabits open areas of the western U.S., from 5,000 feet to 14,000 feet. The mountain bluebird prefers more open habitats than other bluebirds and can be found in colder habitats in winter. It occurs in orchards, agricultural land, and open, mountain meadows near trees. Typically, the species occurs in Colorado from early May through the summer (CPW 2012a). Mountain bluebirds typically forage in open areas, but nest in nearby forests. Nests are constructed in cavities in trees, snags, and frequently in nest boxes. The Project area is within mountain bluebird summer breeding range, but preferred nesting and foraging habitat is lacking because of a lack of larger openings and forest edge areas preferred by mountain bluebird. In addition, snags suitable for mountain bluebird nesting with adjacent meadow openings are not prevalent in the analysis area but may become more common as the mountain pine beetle epidemic progresses. Mountain bluebirds may occasionally forage in or near upland grassland openings in ponderosa pine in the analysis area, but none were observed during field surveys.

Suitable habitat within the Project vicinity is restricted to the ponderosa pine woodlands, upland meadow/wetland mosaic, and mountain shrub mosaic vegetation types described in Section 3.7.1, General Vegetation. The Project area is within mountain bluebird summer breeding range, but preferred nesting and foraging habitat is lacking because of a lack of larger openings and forest edge areas preferred by mountain bluebird. In addition, snags suitable for mountain bluebird nesting with adjacent meadow openings are not prevalent in the analysis area but may become more common as the mountain pine beetle epidemic progresses. Mountain bluebirds may occasionally forage in or near upland grassland openings in ponderosa pine in the analysis area (Cedar Creek Associates 2014).

3.10.3.25 Pygmy Nuthatch

The pygmy nuthatch is apparently secure in Colorado (NatureServe Explorer 2012). The species inhabits forests in western North America; especially mature ponderosa pine forests. They are typically found at lower and middle elevations, but can sometimes occur up to 10,000 feet amsl. Pygmy nuthatches forage by climbing trunks and branches to search under bark and in needle clusters for insects and seeds. They are highly social, breed cooperatively, and roost communally in cavities during winter.

Ponderosa pine forests adjacent to the ROWs likely provide suitable habitat conditions for pygmy nuthatch, although the paucity of older age class trees and snags within and near the analysis area may reduce the suitability of habitat conditions. Field surveys indicated that the age class of tree cover in the analysis area is relatively young, but mature forest habitat suitable for pygmy nuthatch is present. No observations of pygmy nuthatch were recorded by field surveys. The mountain pine beetle epidemic will increase the availability of snags in the near future, and this may improve overall habitat quality for pygmy nuthatch in the short-term

Ponderosa pine forests adjacent to the ROW likely provide suitable habitat conditions for pygmy nuthatch. Although the paucity of older age class trees and snags within and near the analysis area may reduce the suitability of habitat conditions. Field surveys indicated that the age class of tree cover in the analysis area is relatively young, but mature forest habitat suitable for pygmy nuthatch is present (Cedar Creek Associates 2014). These suitable habitats within the Project vicinity are restricted to the ponderosa pine woodlands, mountain shrub mosaic, and mixed conifer vegetation types described in Section 3.7.1, General Vegetation.

3.10.3.26 Warbling Vireo

Suitable habitat, including riparian stream bottoms and aspen forest (Barrett 1998), are not present in the Project area.

3.10.3.27 Wilson's Warbler

Suitable habitat for Wilson's warbler in the analysis area is restricted to the North Line and South Line crossings of Solitude Creek. The elevation at these crossing is about 8,400 feet, and wetlands along Solitude Creek support pockets of willows and alder that could be utilized by Wilson's warbler for nesting and foraging.

Generally suitable habitat types within the Project vicinity are restricted to the upland meadow/wetland mosaic, and mountain shrub mosaic vegetation types described in Section 3.7.1, General Vegetation. These habitats are restricted to the crossings of Solitude Creek within the analysis area. The elevation at these crossing is about 8,400 feet, and wetlands along Solitude Creek support pockets of willows and alder that could be utilized by Wilson's warbler for nesting and foraging (Cedar Creek Associates 2014).

3.11 Land Use and Recreation – Existing and Planned

This section describes the historical and existing land use patterns in the Project area and provides a description of the affected environment for recreational opportunities, resources, and activities. Land use and recreation data was collected from Larimer County, and local, state, and Federal sources.

3.11.1 Affected Environment

The Project area is entirely contained within Larimer County, Colorado. It includes public and private lands and is principally located in the Rocky Mountains between Estes Park and Loveland, Colorado. The towns of Loveland and Estes Park are the largest communities in the area. The USFS, BOR, SLB, Larimer County Department of Natural Resources, and NCWCD manage tracts of land within the area and some provide developed and dispersed recreation resources. The remaining lands are privately owned, typically by individuals or ranch holdings.

Private land uses in the Project area include rural residential development on large tracts of private land, ranch holdings, and residential subdivisions. Dispersed grazing land occurs throughout the Project area, but primarily in the east and west regions. There is little if any farm or cropland within the Project area. There is no “Prime Farmland” or “Farmland of Statewide Importance” within the study area.

Public lands afford a vast diversity of recreational uses on National Forest System lands located in the central region of the Project area and Larimer County Open Space lands on the east end. The Larimer County Natural Resources Department provides developed recreational resources at Flatiron Reservoir, Pinewood Reservoir, and Ramsey Shockey Open Space adjacent to Pinewood Reservoir. SLB property abuts the southern boundary of the Ramsay-Shockey Open Space. This land is undeveloped and leased for grazing. While in the Trust, the property will remain under its current management practices. These recreational areas are described in more detail below. Other recreational activities in the Project area include dispersed activities such as hiking, four-wheel driving and ATV use, hunting, dispersed primitive camping, sight-seeing, and wildlife viewing.

3.11.1.1 Private Land Use

Private land use is primarily rural residential and agricultural land for grazing. Land parcels vary in size from small acreages to large tracts of land. In addition to rural residential parcels, there also are a number of residential subdivisions located within the Project area either adjacent to the ROW or in close proximity. These subdivisions generally are located in the east or west regions of the Project area. The existing transmission lines, with 65 to 75-foot H-frame structures and ROWs varying between 20 and 110 feet, are located within or adjacent to these subdivisions.

Residential subdivisions in the east region of the Project area include Newell Lake View subdivision located north of Pinewood Reservoir, Pittington subdivision located just west of Flatiron Reservoir on the north side of County Road 18E, and Yelek, Dallas Benton, and Slota subdivisions all located near Flatiron Reservoir and South County Road 31.

Subdivisions in the west region of the Project area near Estes Park include Park Hill subdivision, Ravencrest Heights, and Meadowdale Hills. The largest subdivision is the Meadowdale Hills subdivision, which consists of 165 residential lots ranging in size from 1 to 4 acres. Meadowdale Hills, an unincorporated subdivision, is located on the north side of U.S. Highway 36, approximately 5 miles outside of the Town of Estes Park. The Larimer County Assessor’s data show that 121 of the lots have been improved (developed). The Park Hill subdivision, adjacent to the Town of Estes Park, also is a single family subdivision within proximity of the ROW and has approximately 23 residential lots and 20 single family homes.

Table 3.11-1 lists the subdivisions located in the Project area, the number of developed and undeveloped lots in each subdivision, and the use type and county zoning. **Figure 3.11-1** shows the location of the subdivisions in the Project area, as well as Crocker Ranch.

Table 3.11-1 Residential Subdivisions within Project Area

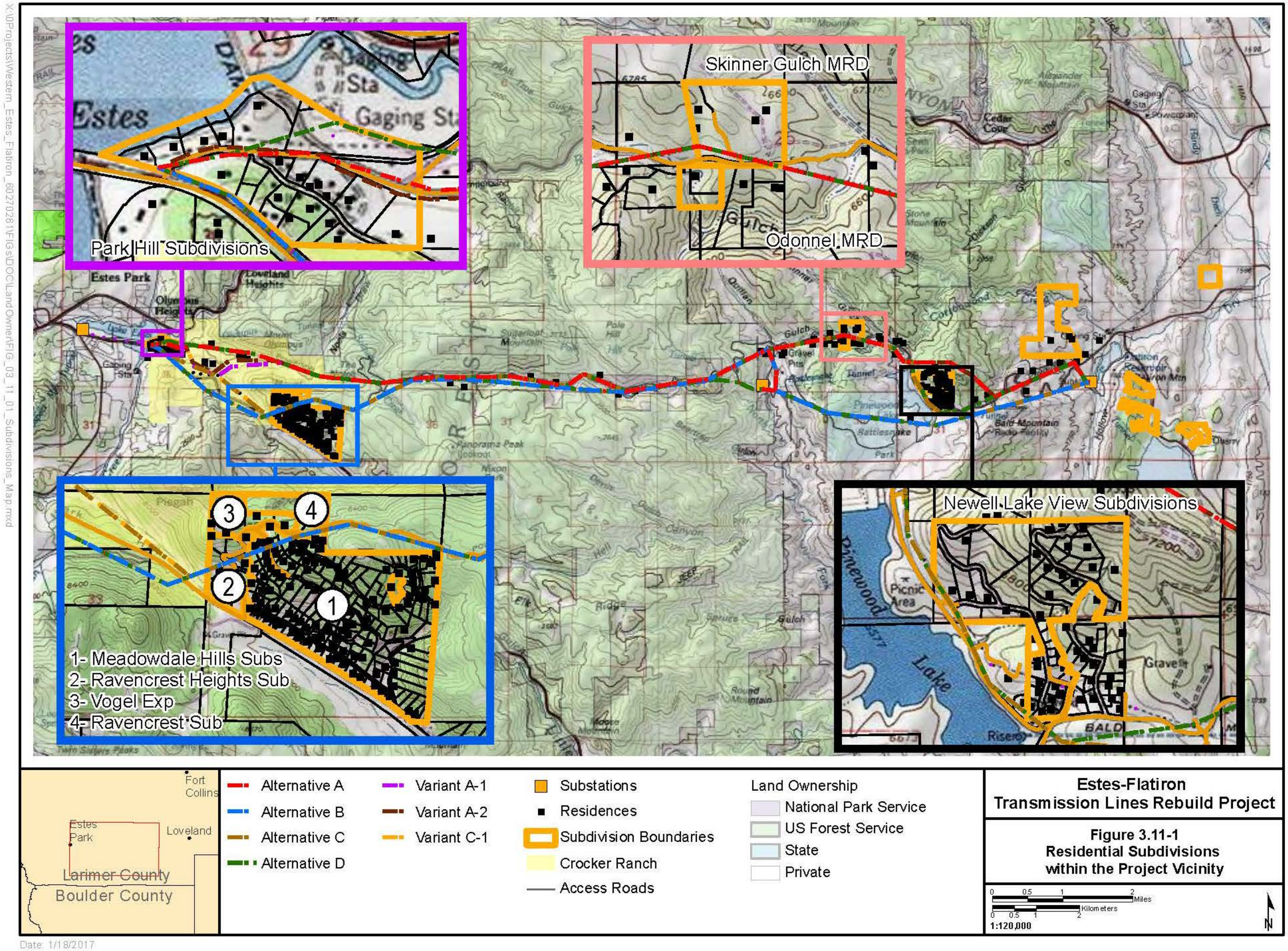
Subdivision	Estimated Undeveloped Lots	Developed Lots	Total Residential	Use Type/Zoning	Location
West Side					
Meadowdale Hills	44	121	165	Single Family/Open	North of U.S. Highway 36 off Pole Hill Road
Ravencrest Heights	5	7	12	Single Family/Open	Same vicinity as Meadowdale Hills
Park Hill	3	20	23	Single Family and Equipment Storage (2)/Rural Residential	Near Mall Road

Table 3.11-1 Residential Subdivisions within Project Area

Subdivision	Estimated Undeveloped Lots	Developed Lots	Total Residential	Use Type/Zoning	Location
East Side					
Yelek	2	8 - Farm	4	Residential, Farm utility, Industrial/Open	East of Flatiron Reservoir
Slota	0	1	1	Residential/Open	West of S County Road 31
Dallas Benton	0	1	1	Residential/Open	West of S County Road 31
Pittington	17	4	4	Residential and Grazing land/Open	West of Flatiron Reservoir
Newell Lake View[1]	9	42	38	Single Family, Duplex, Storage/Open	North of Pinewood Reservoir

[1] Not included are 18 residential lots located adjacent to the Newell Lake View Subdivision.

Source: Larimer County 2016, 2012a.


Park Hill Subdivisions
Skinner Gulch MRD
Odonnel MRD
Newell Lake View Subdivisions
1- Meadowdale Hills Subs
2- Ravencrest Heights Sub
3- Vogel Exp
4- Ravencrest Sub
Fort Collins
Estes Park
Loveland
Larimer County
Boulder County
Alternative A
Alternative B
Alternative C
Alternative D
Variant A-1
Variant A-2
Variant C-1
Substations
Residences
Subdivision Boundaries
Crocker Ranch
Access Roads
Land Ownership
National Park Service
US Forest Service
State
Private
Estes-Flatiron
Transmission Lines Rebuild Project
Figure 3.11-1
Residential Subdivisions within the Project Vicinity
Miles
Kilometers
1:120,000
Date: 1/18/2017

3.11.1.2 Recreation

High quality, diverse recreation opportunities are present in the general Estes Park area, particularly given the town's proximity to Rocky Mountain National Park. Year-round recreation opportunities in the general area include, but are not limited to, fishing, hiking, horseback riding, hunting, jeep tours, four-wheel driving, mountain biking, boating, camping, canoeing, scenic driving, scenic/wildlife viewing, golfing, kayaking/rafting, mountaineering/rock climbing, outfitter and guide services, cross-country skiing, and snowshoeing. Estes Park is the main gateway to Rocky Mountain National Park, which receives an estimated 3 million visitors annually.

The recreation analysis area encompasses recreation uses/areas within or immediately adjacent to the transmission lines' ROWs, as well as any recreation uses/areas accessed from roads or trails within the transmission lines' ROWs. Within the study area, recreation occurs at several different locations as detailed in **Table 3.11-2**. The following sections describe the recreation opportunities and uses on Federal, county, local, and private lands.

Table 3.11-2 Recreation Areas within the Analysis Area

Ownership/Management	Recreation Area
Federal	Roosevelt National Forest
County	Flatiron Reservoir County Park Pinewood Reservoir County Park Ramsay-Shockey Open Space Chimney Hollow Open Space
State and Local Estes Valley Recreation and Park District Colorado Parks and Wildlife	 Lake Estes Game Management Unit 20
Private	Blue Mountain Bison Ranch

<u>Roosevelt National Forest</u>

The analysis area includes lands within the Canyon Lakes Ranger District of the Roosevelt National Forest. Recreation opportunities on National Forest System lands in the analysis area include dispersed camping, hunting, hiking, ATV and four-wheel drive vehicle use, mountain biking, and wildlife viewing.

The National Forest System lands within the analysis area include areas known as The Notch and Pole Hill. Access to the Roosevelt National Forest is available from the west and east region of the analysis area via USFS Road 122 (Pole Hill Road); however, in the central region Pole Hill Road is privately owned and closed to the public. Closer to Estes Park, access to the forest is located just east of the Meadowdale Hills subdivision. On National Forest System lands beyond the subdivision, Pole Hill Road is only open seasonally. The road is open between June 15 and November 30 and receives substantial four-wheel drive use during this time. Pole Hill Road can be used to access other USFS roads to create loop opportunities for motorized recreation. On the east side of the analysis area, USFS Road 122 (Pole Hill Road) does not have seasonal restrictions (USFS 2009). Recreation use within the analysis area on National Forest System lands generally occurs on or from Pole Hill Road. Popular recreational uses on Pole Hill Road include four-wheel drive use and hunting. One outfitter and guide is currently permitted to use Pole Hill Road for four-wheel drive tours in the west region. Dispersed camping is permitted up to 300 feet from the centerline of the road (USFS 2009) on both the east and west sides of the analysis area. Additional information on hunting is provided under Local Recreation opportunities. Travel management issues on Pole Hill Road include the creation of illegal routes and the resulting resource damage.

According to the USDA 2010 National Visitor Use Monitoring survey, the Arapaho and Roosevelt National Forests received an estimated 6 million site visits (USFS 2012b). Though the Canyon Lakes Ranger District does not have recreation use estimates for particular roads, due to Pole Hill Road's location near Estes Park, the highest-use gateway to Rocky Mountain National Park, the road receives a high level of use from four-wheel drive enthusiasts.

Recreation Opportunity Spectrum

The USFS (1976) has developed the ROS to describe recreation settings and opportunities available on National Forest System lands. ROS classes are delineated and mapped to identify which areas provide certain types of recreation settings, ranging from urban settings to unmodified primitive settings. The ROS class currently applicable to National Forest System lands in the analysis area is "roaded natural." This class is characterized by a predominantly natural-appearing environment with moderate evidence of the sights and sounds of humans; conventional motorized use is allowed in this ROS class. Evidence of humans usually harmonizes with the natural environment. The interaction between users may be moderate to high and evidence of other users is apparent. Resource modification and utilization practices are evident but harmonize with the natural environment (USFS 1976).

Recreation Opportunities on County Lands

Recreation opportunities at Larimer County managed parks and open spaces are concentrated in the eastern portion of the analysis area. County lands support a variety of developed and dispersed recreational uses, including hiking, mountain biking, camping, boating, fishing, and picnicking. **Table 3.11-3** below summarizes the recreation facilities at three of the four county parks and open spaces in the analysis area; Chimney Hollow Open Space does not have any recreation facilities at this time.

Table 3.11-3 Larimer County Recreation Sites with Facilities

Recreational Site	Campsites	Occupancy/ Use	Amenities	Activities	Information/ Location
Flatiron Reservoir County Park	38 campsites including electric campsites, camper cabins, and tent sites	NA	Campground, restrooms, picnic areas, group picnic area, cabins, water, wheelchair accessible fishing pier	Fishing picnicking, camping	47 acres of open water, 200 acres of public lands, open year-round
Pinewood Reservoir County Park	27 campsites including non-electric campsites and tent sites	NA	Campground, boat launch, restrooms, picnic areas, water	No-wake boating, camping, fishing, picnicking	100 acre reservoir, 327 acres of public lands, open year-round
Ramsay–Shockey Open Space	NA	15,000 annually for fishing, hiking, horseback riding and mountain biking	4+ mile natural surface trail (2 loops), 2 short wheelchair accessible trail segments (one at each trailhead)	Hiking, mountain biking, fishing access, horseback riding	177 acres, open year-round

NA = not applicable.

Sources: Larimer County 2015a, 2013 a-c, 2012b.

Located northwest of Carter Lake, Flatiron Reservoir County Park contains 47 acres of open water and 200 acres of land at the base of the foothills in a fairly undeveloped natural setting. The park is open year-round for camping, fishing, and picnicking. The park provides a wheelchair accessible fishing pier, campground, two cabins, picnic areas, restrooms, water, and a group picnic area (Larimer County 2013a, 2012b). All of these facilities are located on the northwest side of the reservoir (Larimer County 2013d). The lake is stocked with rainbow trout in the spring and fall (Larimer County 2013a).

Larger than Flatiron Reservoir, Pinewood Reservoir County Park contains 100 acres of open water and 327 acres of land in a mostly natural forest and meadow setting with limited development along one portion of the lakeshore. The park is open year-round for camping, fishing, picnicking, and boating (no wake). Three campground loops, restrooms, water, picnic areas, and a boat launch are provided at the park (Larimer County 2013b, 2012b). These facilities are located on the northeast side of the reservoir, while the Ramsay-Shockey Open Space is located northwest of the reservoir (Larimer County 2013e). The reservoir is popular for boat, shore, and fly fishing for trout (Larimer County 2013b).

The Ramsay-Shockey Open Space area is located immediately adjacent to Pinewood Reservoir. Larimer County purchased this 177-acre open space area in 1997 to provide a buffer to the existing Pinewood Reservoir and as an additional area for passive recreation opportunities (Larimer County 2013c). The area contains 4 miles of easy to moderate trails that are used for hiking, mountain biking, horseback riding, and fishing access (Larimer County 2013f). The 4 miles of trail is split into two 2-mile loop trails, the Shoshone Trail and the Besant Point Trail (Larimer County 2013c). There are two brief wheelchair accessible segments on the Besant Point Trail, one at the Ramsay-Shockey Trailhead and the other at the Blue Mountain Trailhead (Larimer County 2013f). A self-guided interpretive brochure is available for the Shoshone Trail (Larimer County 2009).

Although all three areas are open year-round, most recreation use occurs during the summer months. From Memorial Day to Labor Day, most campsites at Pinewood and Flatiron Reservoirs are fully occupied during the weekends and holidays. Campsites at Flatiron Reservoir also are often full during the week. Pinewood Reservoir and Ramsay-Shockey Open Space are very popular for fishing.

Larimer County parks have an estimated 1.3 million visitors annually; however, this total encompasses all Larimer County parks, including Horsetooth Mountain Park and Carter Lake, which have much higher use levels than Pinewood and Flatiron Reservoirs. No occupancy statistics are available for the Pinewood and Flatiron campgrounds and recreational facilities. Recreational use has been increasing over the years as reflected in increased revenues from facility user fees. Fees have not increased in the past several years, but total revenues have increased substantially. A recreation use survey was completed at Pinewood Reservoir 6 years ago and annual use is estimated at 15,000 users for all activities, including fishing, at the Ramsay-Shockey Open Space area.

Located between Flatiron and Pinewood Reservoirs, the 1,847-acre Chimney Hollow Open Space Area was purchased by the Larimer County Open Lands Program in 2004 and is currently undeveloped. The open space area includes rolling hills, meadows, shrublands, riparian areas, and forested areas. Recreational facilities anticipated for the area include a trailhead, parking area, and approximately 10 miles of trails for mountain biking, equestrian use, and hiking. The NCWCD purchased 1,600 acres east of the open space area for a proposed storage reservoir. Should the reservoir be built, it is anticipated that kayaking, canoeing, sailing, fishing and other passive, non-motorized recreation will be available at the reservoir (Larimer County 2013g). Though Chimney Hollow is still not open to the public, in 2012, guided public tours of the open space area were offered on 2 days in June 2012 (Larimer County 2012c). It is anticipated that the Chimney Hollow Open Space Area will open congruently with completion of the Chimney Hollow Reservoir.

<u>State and Local Recreation Opportunities</u>

At the very western end of the analysis area is Lake Estes, where the Estes Valley Recreation and Park District provides many recreation opportunities and facilities. At the lake, the district provides a marina, pavilion, the Lake Estes Trail, and several picnic areas. Across from the lake at Stanley Park, the district provides athletic fields, a gun club, a playground, tennis, basketball and volleyball courts, skate parks, and a dog park (Estes Valley Recreation and Park District 2013a,b).

The analysis area also provides hunting opportunities on public and private lands. Hunting in Colorado is managed by Colorado Parks and Wildlife, which has divided the state into game management units. The analysis area is within Game Management Unit 20. The unit is large and extends generally from Niwot in Boulder County north to Buckhorn Road in Larimer County, and from I-25 west to Rocky Mountain National Park. The area is within the Big Thompson Deer Herd Management Plan (DAU D-10) and Saint Vrain Herd Elk Management Plan (DAU-E9). National Forest System lands and private land off of Pole Hill Road receive heavy hunting use for big game (deer and elk), particularly on the west side of the analysis area (Spowart 2012). The east side of the analysis area receives only moderate use for deer, elk, small game, and wild turkey, primarily due to limited public access along Pole Hill Road.

Harvest figures for Game Management Unit are shown in **Table 3.11-4**. Only a small percentage of the harvest and total recreation days occur in the analysis area due to the size of Game Management Unit; however, wildlife officials concur that hunting pressure is strong due to its Front Range location near large population centers. As mentioned previously, Pole Hill Road is seasonally closed on the west side of the analysis area between December 1 and June 14; however, the dates can vary somewhat based on weather/road conditions. Hunting generally occurs from the third week in August to the end of January. The area is accessed on horseback or foot once the road closes December 1.

Table 3.11-4 Game Management Unit 20 Harvest, Hunter, and Recreation Days for all Manners of Take

Year	Game	Harvest	Total Hunters	Total Success (%)	Total Recreation Days
2011	Elk	269	631	43	6,377
2010	Elk	178	529	34	3,377
2009	Elk	297	860	35	7,627
2011	Deer	592	1,667	36	8,455
2010	Deer	629	1,666	38	8,526
2009	Deer	730	2,108	35	14,145

Source: CPW 2012b.

Although Estes Park is a year-round tourist attraction and attracts winter recreationists for cross-country skiing, snowshoeing, and other winter activities in Rocky Mountain National Park and surrounding areas, the analysis area is not as popular for winter recreation.

3.11.1.3 Wilderness

There are no federally designated wilderness areas within the analysis area. The closest wilderness area is Comanche Peak Wilderness Area, approximately 6 miles north toward Glen Haven, Colorado.

3.11.2 Management Considerations

A number of land management plans apply to the land use and recreation analysis area. These include the ARP 1997 Forest Plan; the 2008 Colorado Statewide Comprehensive Outdoor Recreation Plan; Stewardship Plan for the Chimney Hollow Open Space; Larimer County Parks Master Plan 2007;

Resource Management Plan for Horsetooth, Carter, Flatiron, and Pinewood Reservoirs 2007; and Supplemental Resource Management Plan for Pinewood Reservoir: Ramsay-Shockey Open Space. These plans are described below as they relate to land use and recreation management.

3.11.2.1 1997 Revision of the Land and Resource Management Plan for the Arapaho and Roosevelt National Forests and Pawnee National Grassland

The 1997 Forest Plan provides desired conditions (goals or objectives) and guidelines and standards for recreation. Specific guidelines state that "…utility corridors and electronic sites will be located and designed to blend with the landscape. They will be compatible with the scenic integrity objectives of adjacent management areas" (Chapter 3.0, Section 8.3, Goal 2) (USFS 1997a).

The Project area is located in the Elk Ridge Geographic Area and has Management Area Prescriptions of 3.5 - Forested Flora and Fauna Habitats - Limited Management and 4.2 - Scenery. The Goals and Desired Conditions for this area related to land use, recreation, and scenery management include emphasizing wildlife habitat and non-motorized recreation, implementing seasonal road closures when appropriate for habitat protection and erosion control, providing dispersed recreation opportunities outside of critical wildlife periods, providing access to natural attractions, water features, or areas that provide desired recreation opportunities with high quality scenic value, and allowing natural or manmade facilities to enhance viewing or recreation opportunities. More detailed information on desired goals, standards and guidelines for the management prescriptions within the analysis area can be found in Chapters 2 and 3 of the Forest Plan (Estes-Poudre Ranger District, Elk Ridge Geographic Area) (USFS 1997b).

The Forest Plan also states that evidence of disturbance and human use may be present, but a healthy and attractive appearance of these ecosystems should be maintained because of their desirability for recreational use (USFS 1997b).

3.11.2.2 2008 State Comprehensive Outdoor Recreation Plan

The 2008 Colorado Statewide Comprehensive Outdoor Recreation Plan states that over 75 percent of Coloradans participate weekly in outdoor recreational activities. The most popular forms of recreation are walking, family gatherings, viewing/photographing natural scenery, sightseeing, pleasure driving, and wildlife viewing/photography. Outdoor recreation and tourism of all types is a highly popular and very important component of Larimer County's identity and economy. The Front Range region is anticipated to experience a 45 percent increase in population from 2007 to 2030, which will significantly impact the demand for recreation in the area. The majority of the population in Colorado is located in the Front Range, causing the highest demand for recreation opportunities.

Spending related to recreation and tourism in the Front Range Region also is important. It is estimated that in 2006 alone, recreation and tourism contributed more than $9.1 billion to the economy of the Front Range Region (Colorado State Parks 2008).

3.11.2.3 Stewardship Plan for the Chimney Hollow Open Space

The Stewardship Plan for the Chimney Hollow Open Space (Larimer County undated) provides the formal guidelines for short-term stewardship of the area until a management plan is developed in the future. The Chimney Hollow Open Space is part of the larger vision for the Blue Mountain Conservation Area, as identified in the 2015 Larimer County Open Lands Management Plan (Larimer County 2015b), to protect the mountain backdrop south of the Big Thompson River, including the Little Thompson River, and provide better linkages between conserved lands and to the National Forest lands to the west and to Boulder County to the south. The vision for the Chimney Hollow Open Space area "is to protect the native vegetation, natural rock outcrops, native wildlife, and cultural resources while in the long-term providing outdoor recreational opportunities" (Larimer County undated). Potential recreation opportunities in the future would be based on a management plan and may include a trailhead and non-motorized trails. Near-term educational opportunities include guided public tours of the site, development of educational materials, and encouraging appropriate research/educational activities (Larimer County undated).

3.11.2.4 Larimer County Parks Master Plan 2007

The Master Plan outlines the desired visitor experience, resource conditions, managerial conditions, and future visitation and facilities for Horsetooth, Carter, Flatiron, and Pinewood Reservoir parks. At Flatiron Reservoir, desired recreation experiences include opportunities for highly social and developed full-service camping, shoreline fishing, picnicking in a scenic location, group picnicking, and trail use. Desired managerial conditions include a good level of safety, maintenance of facilities at a high quality condition, and management for a moderate to high level of visitation and revenue. Future improvements at Flatiron Reservoir could include up to three new cabins and connector trails to future Chimney Hollow Open Space trails and other areas, potentially enabling non-motorized travel between Flatiron Reservoir, Carter Lake, and Pinewood Reservoir.

At Pinewood Reservoir, desired recreation experiences include opportunities primarily for fishing, as well as non-motorized boating and no-wake motorized boating, somewhat social and rustic camping adjacent to the reservoir, picnicking in a scenic location, and trail use. Desired managerial conditions include a good level of safety, maintenance of facilities in a high quality condition, and management for a moderate level of visitation and revenue. Future improvements at Pinewood Reservoir could include reconfiguring the Blue Mountain area to include two new cabins and a new Shoreline Trail, reconfiguring the boat ramp area to add picnic tables and benches and convert all camping to tent-only, renovating the Windy Pines campground to include new pull-through, recreational vehicle, and walk-in sites as well as a formal trail network connecting campsites to the Shoreline Trail, and reconfiguring the parking at Pinewood Dam area and adding a new overlook and benches to this site (Larimer County 2007).

3.11.2.5 Resource Management Plan for Horsetooth, Carter, Flatiron, and Pinewood Reservoirs 2007

The Resource Management Plan (RMP) states that Larimer County reservoirs are owned by the BOR, but are managed through a land use agreement by Larimer County. The Plan includes a goal to provide appropriate opportunities for nature-based recreation. Objectives for this goal include providing additional low-intensity activities, developing additional trails, encouraging repeat and year-round visitation, further developing certain recreational activities, improving/expanding visitor access and use of shoreline areas, adapting to changing recreation trends, monitoring carrying capacity of the reservoirs, and limiting exclusive use of public resources. The plan also includes guiding statements for Flatiron and Pinewood Reservoirs, which are the same desired recreation experiences and managerial conditions as stated in the Larimer County Parks Master Plan. Recreation and Visitor Services Management actions include Larimer County Parks continuing to operate and manage the recreation and other visitor services at the reservoirs, providing visitor and interpretive information, and providing shoreline access for all populations wherever possible. Implementation actions included in the plan for Flatiron and Pinewood Reservoirs are the same future improvements noted in the Larimer County Parks Master Plan (BOR and Larimer County Parks and Open Lands Department 2007).

3.11.2.6 Supplemental Resource Management Plan for Pinewood Reservoir: Ramsay-Shockey Open Space

The Ramsay-Shockey Open Space Management Plan is a supplement to the RMP for Horsetooth, Carter, Flatiron, and Pinewood reservoirs. Many of the recreation-related actions included in the management plan have already been implemented. The vision for the open space area is “the creation of a multi-use trail that would allow for such activities as hiking, mountain biking, and horseback riding” (Larimer County undated). Implementation of the outdoor recreation management component of the plan includes designing and building the trail; adding trail signage; providing ongoing trail and parking area maintenance; incorporating the area into the regular park ranger public activities, education and enforcement schedule; building a scenic overlook; expanding the parking area; installing picnic sites;

removing interior fences; and adding road signage. Education opportunities include interpretive brochures and signs, a trailhead marker with a map of the area and trails, and volunteer-led hikes (Larimer County undated).

3.11.3 Planned Land Uses

Larimer County is planning to renovate the Pinewood Reservoir Campground. The existing footprint will likely not be expanded, but improvements will be made to the campground and facilities. Renovations were expected to be complete in spring of 2014 (Larimer County 2013h).

Chimney Hollow Reservoir is proposed as part of the Windy Gap Firming Project (BOR 2015). The 90,000-acre-foot reservoir would be located southwest of Loveland and just west of Carter Lake. The Final EIS for the Project has been released and a ROD was issued December 2014. Final USACE permits are anticipated by the end of 2017 with subsequent design and construction slated to take about 5 years.

NCWCD will manage the water use, while Larimer County will manage the recreational use rights on the reservoir. It is anticipated that there will be 10 to 12 miles of non-motorized hiking/mountain biking/horseback riding trails west of the reservoir. The reservoir will be open to sailing, canoes, and other wakeless boating activity, as well as fishing and similar activities available at Pinewood and Flatiron Reservoirs. Limited deer and elk hunting also is anticipated for Chimney Hollow.

3.12 Visual Resources

3.12.1 Methodology

The Scenery Management System (SMS), adopted by the USFS in 1995 (USFS 1995), has been used to evaluate the quality of scenery for the Estes-Flatiron Transmission Line Rebuild Project. The SMS system employs a systematic approach for analyzing landscape character, including scenic attractiveness and scenic integrity, and landscape visibility associated with sensitive viewers. Photographs from key observation points (KOPs) were selected and described for detailed analysis.

3.12.1.1 Visual Resource Definitions

Several key terms from the USFS's SMS methodology are used in this section to describe the visual resources of the Estes-Flatiron Project area (USFS 1995). The SMS system applies the following ratings to National Forest System lands, which also are applied to other affected lands for consistency:

Landscape character consists of the physical, cultural, and biological attributes that make a landscape identifiable, unique, or give it a memorable sense of place.

Scenic attractiveness is a measure of the visual appeal of a given landscape and can range from *Class A* (distinctive) to *Class C* (indistinctive).

Scenic integrity is a measure of the intactness associated with the visual elements that define a landscape character unit and can range from *Very High* to *Unacceptably Low*. Scenic integrity is defined in the SMS system according to six levels, defined below.

- *Very High* – The valued landscape character 'is' intact with only minute, if any, deviations. The existing landscape character and sense of place is expressed at the highest possible level.
- *High* – The valued landscape character 'appears' intact. Deviations may be present but must repeat form, line, color, texture and pattern common to the landscape character so completely and at such scale that they are not evident.
- *Moderate* – The valued landscape character 'appears slightly altered.' Noticeable deviations must remain visually subordinate to the landscape character being viewed.

- *Low* – The valued landscape character 'appears moderately altered.' Deviations begin to dominate the valued landscape character being viewed, but they borrow valued attributes such as size, shape, edge effect and pattern of natural openings, vegetation type changes, or architectural styles outside the landscape being viewed. They should not only appear as valued character outside the landscape being viewed, but compatible or complementary to the character within.
- *Very Low* – The valued landscape character 'appears heavily altered.' Deviations may strongly dominate the valued landscape character. They may not borrow from valued attributes such as size, shape, edge effect and pattern of natural opening, vegetation type changes, or architectural styles within or outside the landscape being viewed. However, deviations must be shaped and blended with the natural terrain (landforms) so elements such as unnatural edges, roads, landings, and structures do not dominate the composition.
- *Unacceptably Low* – The valued landscape being viewed appears extremely altered. Deviations are extremely dominant and borrow little if any form, line, color, texture, pattern, or scale from the landscape character. Landscapes at this level of integrity need rehabilitation.

Landscape Visibility is a measure of discernible detail in the landscape, relative to the viewer and their viewing conditions. Landscape visibility varies dramatically depending on many, interconnected factors including: 1) context of viewers; 2) duration of view; 3) degree of discernible detail; 4) seasonal variations; and 5) number of viewers.

Sensitive Viewers. Constituents evaluated as 'sensitive viewers' have a high degree of concern, activities and attitudes toward scenery and potential changes to landscape character. Travelways and recreation use areas considered sensitive viewing locations for the Project include, among others, local roads, parks, recreational reservoirs, visitor centers, campgrounds, hiking trails, as well as lands generally used for dispersed activities such as hunting, photography, wildlife viewing, and general solitude experiences.

Concern Levels are a measure of the degree of public importance placed on landscapes viewed from travelways and use areas. Three levels – 1, 2, and 3 – are used to denote the intensity of viewer concern, based on type of use and volume of use, with 1 being the highest level of concern. Input received from field observation, agency and public scoping comments, National Visitor Use Monitoring results (USFS 2012b), and media coverage was used to determining concern levels.

Distance Zones are defined as four categories in the SMS system: Immediate Foreground – 0 to 300 feet; Foreground – 300 feet to 0.5 mile; Middleground – 0.5 mile to 4 miles; and Background – 4 miles to the horizon.

Visual Sensitivity is used in this section as a measure for expressing the composite landscape visibility conditions from specific KOPs. Three levels are used to describe the combined influences of viewer type, concern level and distance zone: *High, Moderate*, and *Low.*

Visual Absorption Capability is the relative ability of a landscape to accept human alterations without loss of character or scenic quality (USFS 1995). Visual absorption capability is an indicator of the fragility or potential difficulty, and thus the potential cost, of predicting achievable scenic condition levels resulting from management activities in a landscape. Slope, vegetation cover, geology and soils are key factors in determining how visual absorption capability is expressed for each unit, as *High, Moderate*, and *Low.*

KOPs are representative viewing locations within the Project area, which have been chosen based on scoping comments in consultation with Western and the USFS for detailed analysis and visual simulations. The selection of KOPs is based on a variety of factors including the type of use and concern level, distance zone, landscape character type and associated scenic attractiveness and integrity.

Fourteen KOPs have been identified among the primary and secondary travelway/use areas for detailed visual analysis. The KOP's are listed below, and shown on **Appendix C**. See Section 4.12, Visual Resources, for a comparison of the existing condition to simulated condition for each alternative.

- KOP 1 – Stanley Hotel: view looking southeast toward E-PH and E-LS transmission lines;
- KOP 2 – U.S. Highway 34: view looking southeast toward E-LS and E-PH transmission lines;
- KOP 3 – U.S. Highway 36: view looking northwest toward E-PH transmission line;
- KOP 4 – U.S. Highway 36/Estes Park Overlook;
- KOP 5 – Meadowdale Hills subdivision: view looking northeast toward E-PH transmission line;
- KOP 6 – Pole Hill Road: view from National Forest System lands near Pole Hill Road and Microwave Station, looking southwest toward E-PH transmission line;
- KOP 7 – Pole Hill Road: view from Quillan Gulch Road, looking west toward E-LS transmission line and National Forest System lands;
- KOP 8 – Pinewood Reservoir: view looking south/southwest toward F-PH transmission line;
- KOP 9 – W County Road 18E: view looking southeast toward F-PH transmission line;
- KOP 10 – Pole Hill Road/CR 18E at Flatiron Picnic and Day Use Area: view looking west toward F-PH and E-LS transmission line;
- KOP 11 – Hermit Park: looking towards South Line through Meadowdale Hills;
- KOP 12 – Lake Estes causeway/U.S. Highway 36: view looking east towards Project end point;
- KOP 13 – Newell Lake View subdivision: view looking east; and
- KOP 14 – Pole Hill Road: view looking west from Pole Hill Road on National Forest System lands towards Mount Pisgah, east of Meadowdale Hills subdivision.

3.12.2 Project Area Overview

The Estes-Flatiron Project study area is located in the Southern Rocky Mountains Physiographic Province (Fenneman and Johnson 1946). Project lands fall within the ecological subregion M331 Southern Rocky Mountain Steppe – Open Woodland – Coniferous Forest – Alpine Meadow Province' (Bailey et al. 1994). The Project area is characterized as an aspect-dependent dry continental forest. Precipitation is around 20 inches per year, with approximately 50 percent occurring in the form of snow. Elevations within the Project study area generally range from 5,500 to 9,200 feet. Mountains within the Project area generally reach 8,500 to 9,000 feet in the western and central Project area, while less dominant ridge and mountain features are found to the east, at elevations of 7,000 to 8,000 feet.

This area is a mixture of foothills shrub-grass communities, juniper-ponderosa pine communities on south slopes, and Douglas fir-mixed conifer on north slopes, as described in the USFS Elk Ridge Geographic Area (USFS 1997a). Vegetation management has occurred throughout the area for the past 100 years beginning with harvesting for materials for homesteads and ranches. Most of the vegetation in the area is second growth with patches of remnant old growth ponderosa pines. Ponderosa pine has encroached into historic meadows as a result of fire suppression resulting in more views being screened. Pine beetle fuel treatments and mixed/variable-severity wildland fires are increasingly common in and corridor patches throughout National Forest System lands and private lands, as fuel loadings are high due to the subsequent mortality in the ponderosa pine community as described in Section 3.7, Vegetation.

Numerous residential developments, resorts, golf courses, and visitor services are present along with parks, trails, and several utility corridors. Existing utility corridors include lattice and wood pole transmission lines, a gas pipeline, and water facilities for the CBT Project. In the eastern part of the

Project area, larger acreage rural residential homes, horse farms, pipelines and reservoirs of the CBT, distribution and transmission lines and local roadways are visually prominent. Development on private lands of both year-round and seasonal housing and tourism continues to increase as described in Section 3.11, Land Use and Recreation. Recreational use (motorized) is moderate during most of the year, except for winter, and increases during the hunting season as described in Section 3.11, Land Use and Recreation.

Travel routes in the western Project area are numerous and include U.S. Highways 36 and 34, which are major transportation corridors between Rocky Mountain National Park and the Front Range cities of Loveland, Fort Collins, Boulder, and Denver. Travel routes are in the east and central regions of the Project area are limited, with Pole Hill Road (USFS Road 122) being the only east-west route across the Project area and National Forest System lands. Approximately 5 miles of Pole Hill Road is closed to public access from Section 36, T5N R72W to Section 27, T5N R71W. In the eastern part of the Project area, several county roads, including West County Road 18E and North County Road 31 provide access.

Figure 3.12-1 shows the study area for visual resources and topographic features and elevations.

3.12.2.1 Landscape Character Units, Scenic Attractiveness, Existing Scenic Integrity, and Visual Absorption Capability

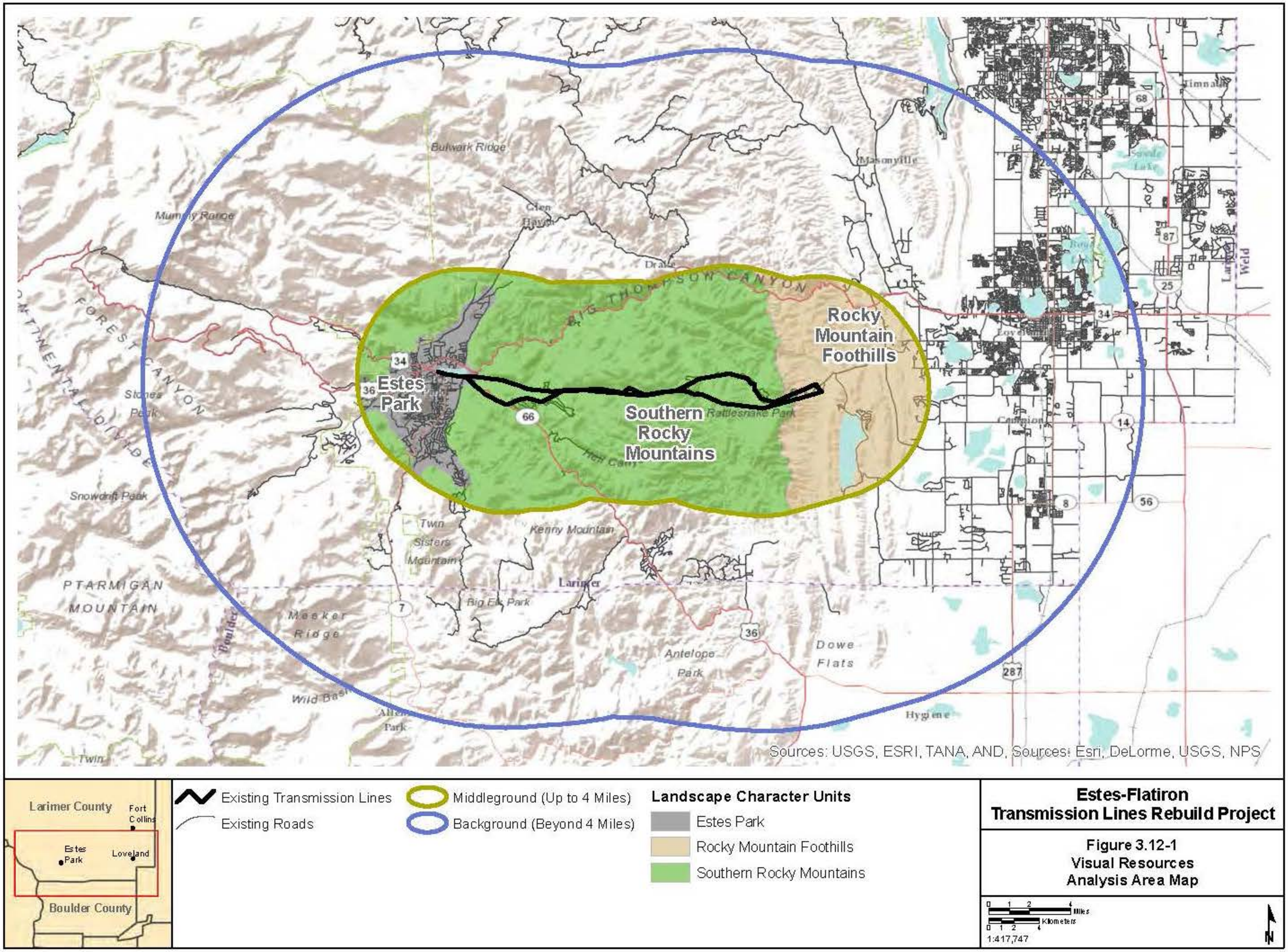
Landscape character units were delineated for the Estes-Flatiron Project area, based on similarities in physiographic landforms, rock forms, water forms, vegetation colors and patterns, and similar land use characteristics (View Point West 2012). Three landscape character types are crossed by the Project and were evaluated for Scenic Attractiveness, Existing Scenic Integrity, and Visual Absorption:

- Estes Park or the Estes Valley. This unit begins at the western terminus of the Project and affords most views of the Project from The Notch westward.
- The Southern Rocky Mountains, west and east of Estes Park. This unit comprises most of the central Project area including mountainous terrain north and south of Pole Hill Road, and Rocky Mountain National Park that surrounds Estes Park.
- The Front Range Foothills. This unit is located on the eastern edge of the Project area.

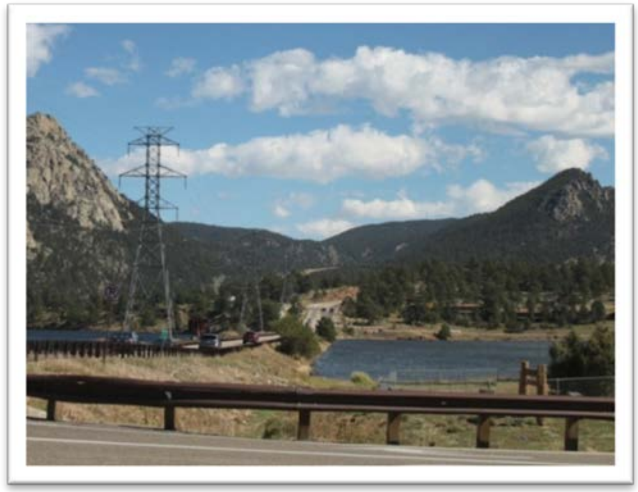
<u>Estes Park Landscape Character Unit (**Figure 3.12-2**)</u>

In the western part of the Project area lays Estes Valley, a broad, bowl-shaped valley that is surrounded by steep mountains. The scale and open character of the valley and steep slopes of adjacent mountains affords panoramic views in most directions.

Estes Valley is characterized by a mosaic of natural grasses, conifer stands of ponderosa and lodgepole pine, sagebrush, and deciduous trees along stream beds that are intermixed with community landscapes and commercial and housing developments. Prominent water features in the Project foreground include Lake Estes and the Big Thompson River. Lake Estes is approximately 185 acres in size and lies in the center of the valley, above the Olympus Dam. The Big Thompson River has its headwaters in Rocky Mountain National Park and flows through Estes Park, before entering the Big Thompson Canyon below Lake Estes. These water features are major influences on the valley's landscape character, providing movement, color and scenic enhancement. Other smaller water features are associated with streams and ponds that provide variety in wetland vegetation patterns and colors, which contrast with the adjacent native grasses and conifers.

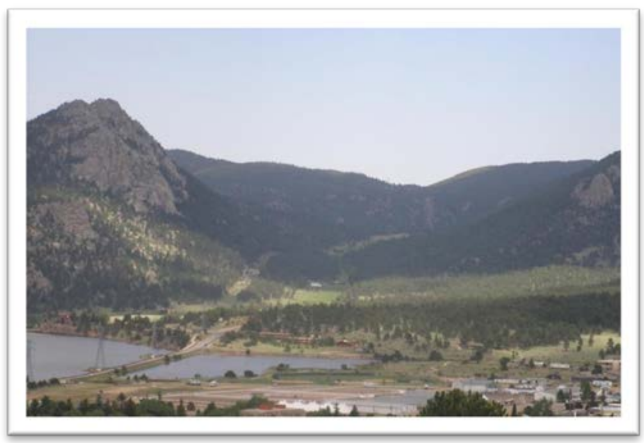

Estes Park
Southern Rocky Mountains
Rocky Mountain Foothills
Big Thompson Canyon
Bulwark Ridge
Mummy Range
Masonville
Glen Haven
Rattlesnake Park
Hell Canyon
Stones Peak
Snowdrift Peak
Continental Divide
Forest Canyon
Twin Sisters Mountain
Kenny Mountain
Ptarmigan Mountain
Meeker Ridge
Big Elk Park
Larimer
Boulder
Antelope Park
Dowe Flats
Wild Basin
Allens Park
Hygiene
Timnath
Loveland
Campion
Weld
Sources: USGS, ESRI, TANA, AND, Sources: Esri, DeLorme, USGS, NPS
Larimer County
Fort Collins
Estes Park
Loveland
Boulder County
Existing Transmission Lines
Existing Roads
Middleground (Up to 4 Miles)
Background (Beyond 4 Miles)
Landscape Character Units
Estes Park
Rocky Mountain Foothills
Southern Rocky Mountains
Estes-Flatiron Transmission Lines Rebuild Project
Figure 3.12-1
Visual Resources Analysis Area Map
Miles
Kilometers
1:417,747
N

Photograph of Lake Estes within Estes Valley, with E-LS (North) Transmission Line) and maintained ROWs in the Middleground (View Point West 2012).



The E-LS (North) and E-PH (South) transmission lines join lattice transmission lines at the western terminus of the Project along U.S. Highway 36 and Lake Estes. The southeastern entrance to Estes Park parallels existing transmission lines heading to the Estes Power Plant to the west of this photograph.

Photograph of Ranch Meadows neighborhood, as an example of how the Project area is typically screened by or seen in context with highway commercial, tourism, and housing developments intermingled in a mosaic of pines and meadows (View Point West 2012).



Photograph of the maintained E-LS (North) ROW from an elevated position in southwestern Estes Park. Natural meadows have feathered, curvilinear edges whereas the utility ROW has straight edges.

Figure 3.12-2 Photographs of the Estes Park Landscape Character Unit (View Point West 2012)

Man-made elements of the landscape include the Town of Estes Park, surrounding residential and commercial developments, cultural attractions, golf courses, recreational parks and trails, local and regional transportation systems, lattice and H-frame transmission lines, wood and steel distribution utility lines, and the Estes Power Plant and Lake Estes Reservoir. The lattice transmission structures along the Lake Estes causeway dominate foreground views (these structures are not part of the proposed Project). The Town of Estes Park is surrounded by scattered, unincorporated residential and commercial uses, and a variety of visitor services and amenities. Prominent land use features within the valley include the historic Stanley Hotel, the Lake Estes golf course, the Stanley Village commercial complex, and the Estes Power Plant. Numerous commercial and hotel developments are located along U.S. Highways 34 and 36, Highway 7, and other local roadways. Cumulatively, these land use developments have created broken lines and complex irregular forms, colors and textures throughout much of the valley. Existing roads and utility corridors have created strong linear features that are visible across the valley and up adjacent mountain slopes. Existing lattice and H-frame transmission lines, structures and conductors have cumulatively created strong horizontal and vertical line and form elements in the western part of the Project environment.

The *scenic attractiveness* of the Estes Park area is *Class B, Typical* (**Table 3.12-1**). The open-closed pattern of meadows and Ponderosa Pine communities, abundant year-round wildlife viewing opportunities, and riparian and water features that add movement, variety and color to the landscape are Estes Park's most attractive characteristics, however this environment is dominated by human developments. It is positively influenced by open, panoramic views from the valley towards adjacent scenery, such as Mount Olympus, Mount Pisgah, and other mountains in Rocky Mountain National Park.

Existing scenic integrity ranges from *high* to *very low* depending on the degree of development, development standards, and site-specific conditions visible from any given location. The surrounding mountains generally have retained high scenic integrity although mixed residential developments, roads and utility corridors are evident on some mountain slopes.

Landscape visibility and *visual absorption capability* ranges from *high* to *moderate*. Although framed within a forested and mountainous context, linear urban infrastructure (roads, trails, power lines, etc.) and buildings are common and highly visible throughout Estes Park. Project facilities are less likely to contrast the natural environment where they are co-located with other urban developments.

Table 3.12-1 Summary of Estes Park Landscape Character Unit

Scenic Attribute	Attribute Rating
Scenic attractiveness class rating	B (typical)
Existing scenic integrity rating	High to very low
Landscape visibility	High to moderate
Visual absorption capability	High to moderate
Key observation points	1, 2, 11, 12

<u>Southern Rocky Mountains West and East of Estes Park (**Figure 3.12-3**)</u>

To the north, west and south of Estes Park are spectacular views toward the towering snow-capped mountain peaks and sculptured rock outcroppings of Rocky Mountain National Park. Within the visual resources Project area, named places within the national park are Lumpy Ridge and Twin Owls.

Photograph of E-PH transmission line along U.S. Highway 36 approaching leaving Estes Park in the Southern Rocky Mountains landscape character unit.

Photograph from a helicopter of existing transmission lines and microwave tower along Pole Hill Road. Pine beetle damage is becoming more pronounced throughout the Project area, and will likely result in a more open landscape in the future.

Photograph of Southern Rocky Mountains (View Point West 2012). Homogeneous conifers with rock outcroppings and rural residential development.

Photograph from a helicopter traversing the Southern Rocky Mountains. Vegetation management and the dissected terrain allows for mature trees to grow under the transmission lines in ravines and other low points.

Figure 3.12-3 Photographs of the Southern Rocky Mountains West and East of Estes Park Landscape Character Unit (View Point West 2012)

The central part of the Project area is characterized by mountainous terrain, which creates undulating lines on the landscape. Slopes are predominantly moderate to steep, with steeper terrain, jagged textures and patterns occurring on rocky peaks. Mount Olympus is a prominent mountain feature, with its jagged rock face soaring above the conifer forest slopes. Other named mountains include Sugarloaf Mountain, Pole Hill, and Panorama Peak.

Vegetation primarily consists of mixed conifers, including junipers, lodgepole pine and ponderosa pine, with understories of native shrubs and grasses. Overall, the conifers create homogeneous medium textures throughout much of this landscape. Increased vegetation diversity and patterns are created where deciduous aspen trees and grasslands occur in dispersed meadows. Overall, textures range from coarse textured escarpments on rocky mountain peaks to medium textures where conifers dominate. Consequently, landscape visibility is often screened by terrain and trees.

In addition to the Big Thompson River and Fall River, there are several intermittent streams and incised drainages including Rabbit Gulch and Quillan Gulch. Drainages typically create localized vegetation patterns, which add interest against adjacent grasses or conifers.

The dominant scale and scenery of Rocky Mountain National Park and nearby mountains to the west strongly enhances the scenery in the western part of the central Project area. In these areas, the color and texture of the homogeneous conifers are viewed against a background of snow-capped sculptured mountain peaks.

Cultural modifications primarily consist of rural residential subdivisions and scattered homes, Pole Hill Road, existing H-frame transmission lines, the Pole Hill Substation and associated CBT water facilities, radio facilities on Bald Mountain and above Newell Lake View subdivision, a microwave station located along Pole Hill road, and a network of unpaved roads and trails.

Overall, the *scenic attractiveness* of the mountains east of Estes Park is *Class B,* with some *Class A* scenery occurring where the landscape is viewed against Rocky Mountain National Park to the west (**Table 3.12-2**). Overall, however, the predominant character of the central Project area, including most National Forest System lands, is a classic Rocky Mountain landscape with ponderosa pine, aspen, meadows and rock outcrops.

Table 3.12-2 Summary of Southern Rocky Mountains West and East of Estes Park Landscape Character Unit

Scenic Attribute	Attribute Rating
Scenic attractiveness class rating	B (typical); some A (distinctive)
Existing scenic integrity rating	Moderate to low
Landscape visibility	High to moderate
Visual absorption capability	High to moderate
Key observation points	3,4,5,6,7,8,11,13

Existing scenic integrity ranges from *moderate* to *low*. Undeveloped landscapes generally are perceived to have high scenic integrity, while the existing transmission lines and residential subdivisions contribute to low to moderate scenic integrity conditions.

Landscape visibility and *visual absorption capability* ranges from *high* to *moderate*. The steep slopes, heavily dissected landform, frequent rock outcroppings, and dense vegetative cover partially screen and break up the visual continuity of most linear alterations. Tree regeneration potential is high which can serve to mitigate openings created by disturbance. Open-closed pattern of meadows and pine stands can provide natural openings from which to borrow when designing utility corridors. At the same time, dense tree communities are more prone to exaggerate the contrast of cleared ROWs; south-facing slopes are less likely to be regenerate compared to north-facing slopes; and Project cleared ROWs would more likely be visible from a distance in closed pine stands than in open meadows.

Rocky Mountain Foothills (**Figure 3.12-4**)

At the eastern edge of Project area, the terrain, vegetation, and water characteristics of the landscape change dramatically. Conifer-covered, south and east-facing mountain slopes rapidly transition to grassland and sagebrush vegetation on foothills and lower elevation mountains. Vegetation cover decreases in density and diversity, exposing highly eroded tan, brown and reddish soils and rocks. Prominent landforms are Bald Mountain, Blue Mountain, Flatiron Mountain, and Chimney Hollow. Vegetation communities are predominantly native grasslands and shrubs that form a softly textured grey/green cover on gentle to rolling slopes. Contrasts in vegetation/soil colors and textures increase on steeper slopes, where sharp ridgelines, red soils and horizontal geologic strata are exposed.

Natural water features are not a major scenic element in this landscape type, although several of the CBT reservoirs, including Pinewood, Flatiron and Carter Lake, are present and provide scenic enhancements in color, movement and texture, as well as recreational opportunities. Natural water features, such as intermittent drainages and gulches generally are defined by increased diversity in vegetation patterns and colors along watercourses.

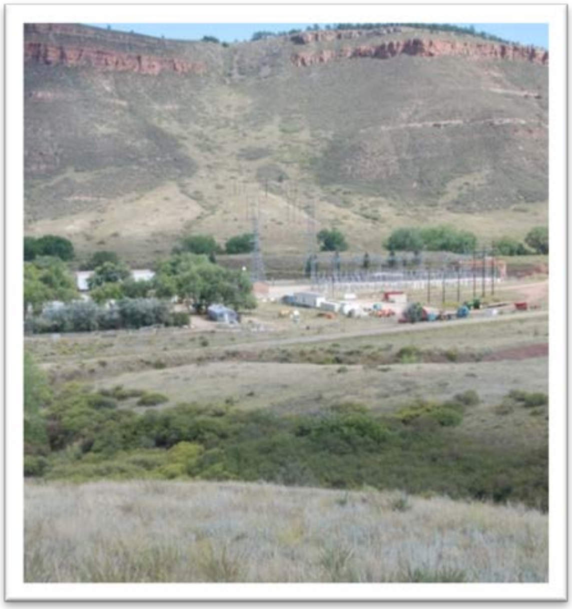
Land use developments include multiple existing H-frame transmission lines and substations the CBT water reservoirs and pipeline, which all increase in frequency and visibility near Flatiron Reservoir. Five transmission ROWs, the aboveground CBT pipeline, and an underground gas pipeline create strong vertical, horizontal and diagonal lines across much of this area. Added to these linear utility lines are numerous distribution power lines serving residential subdivisions. Rural residential subdivisions, larger acreage horse farms, rural developments, and their associated paved and unpaved roads become common throughout the flatter valley areas, and generally create broken lines and forms with a multitude of varying design elements.

The *scenic attractiveness* of the foothills is assessed as Class B (**Table 3.12-3**). *Existing scenic integrity* ranges from moderate to low. Undeveloped areas of the unit generally have moderate scenic integrity, while the presence of numerous paved and unpaved roads, utility ROWs and various types of developments contribute to moderate to low scenic integrity conditions.

Visual absorption capability ranges from moderate to low. The foothills offer less terrain screening and the grasslands offer fewer tree stands to hide utilities. Tree regeneration potential is moderate to low. Soil disturbance is more likely to results in tan and reddish soils remaining visible for longer periods of time compared to the Southern Rocky Mountains. Existing residential subdivisions and linear infrastructure (power lines, roads, and water pipelines) are more visible and may provide opportunities for co-location to minimize potential reductions in scenic quality.

Table 3.12-3 Summary of Rocky Mountains Foothills Landscape Character Unit

Scenic Attribute	Attribute Rating
Scenic attractiveness class rating	B (typical)
Existing scenic integrity rating	Moderate to low
Landscape visibility	High to moderate
Visual absorption capability	Moderate to low
Key observation points	9, 10



Photograph of Flatiron Substation in the Rocky Mountain Foothills landscape character unit (View Point West 2012). Predominantly shrub and grassland vegetation cover on steep hillsides with rock escarpments, with mixed land uses and vegetation diversity in valley and drainages.

Photograph of Rocky Mountain Foothills (View Point West 2012). Flatiron Reservoir, open, rolling terrain with mixed shrub and grassland vegetation dominant.

Photograph of E-LS through the Newell Lake View subdivision where a number of buildings are immediately adjacent to a 20-foot ROW.

Photograph from County Road 18E north of Flatiron Reservoir of Bald Mountain, with the penstocks, radio towers and several electrical transmission and distribution lines including the E-LS and F-PH lines.

Figure 3.12-4 Photographs of the Rocky Mountain Foothills Landscape Character Unit (View Point West 2012)

3.12.2.2 Landscape Visibility

Landscape visibility has been documented for the affected environment by assessing three elements in the study area: Sensitive Viewers, Concern Levels, and Distance Zones.

Sensitive Viewers

Sensitive viewer locations within the Project area are shown on **Figure 3.12-5** through **Figure 3.12-7**. Numerous visitor facilities, recreational trails, travel routes and residential areas occur throughout the Project area.

'Seen area' mapping for sensitive viewers in the Project area is shown on **Figure 3.12-5** through **Figure 3.12-7**. Potential visibility within the Project area was determined through computerized viewshed, or 'seen area' mapping, using USGS digital elevation model 10-meter information. The viewsheds indicate where potential structures averaging heights of 105 feet would be visible by 6-foot tall viewers from highways, residences, and recreation areas within 4 miles of the Project. Darker colors indicate landscapes seen by a larger number of viewers. 'Seen areas' represent potential 'worst-case' viewing conditions (i.e., leaf off/no trees) due to both typical winter conditions and long-term effects of bark beetle kills in the Project area.

Concern Levels

The western part of the Project area is considered highly sensitive (Level 1), due to both its location near Rocky Mountain National Park as well as the sentiments of persons providing scoping comments which frequently expressed concern for potential impacts to scenery at Estes Park, along U.S. Highways 34 and 36, from private residential areas, and from public recreation areas. The concern levels documented for the Southern Rocky Mountains and Foothills is predominantly moderate (Level 2) due to reduced number of viewers, and fewer expressed concerns for these parts of the Project area.

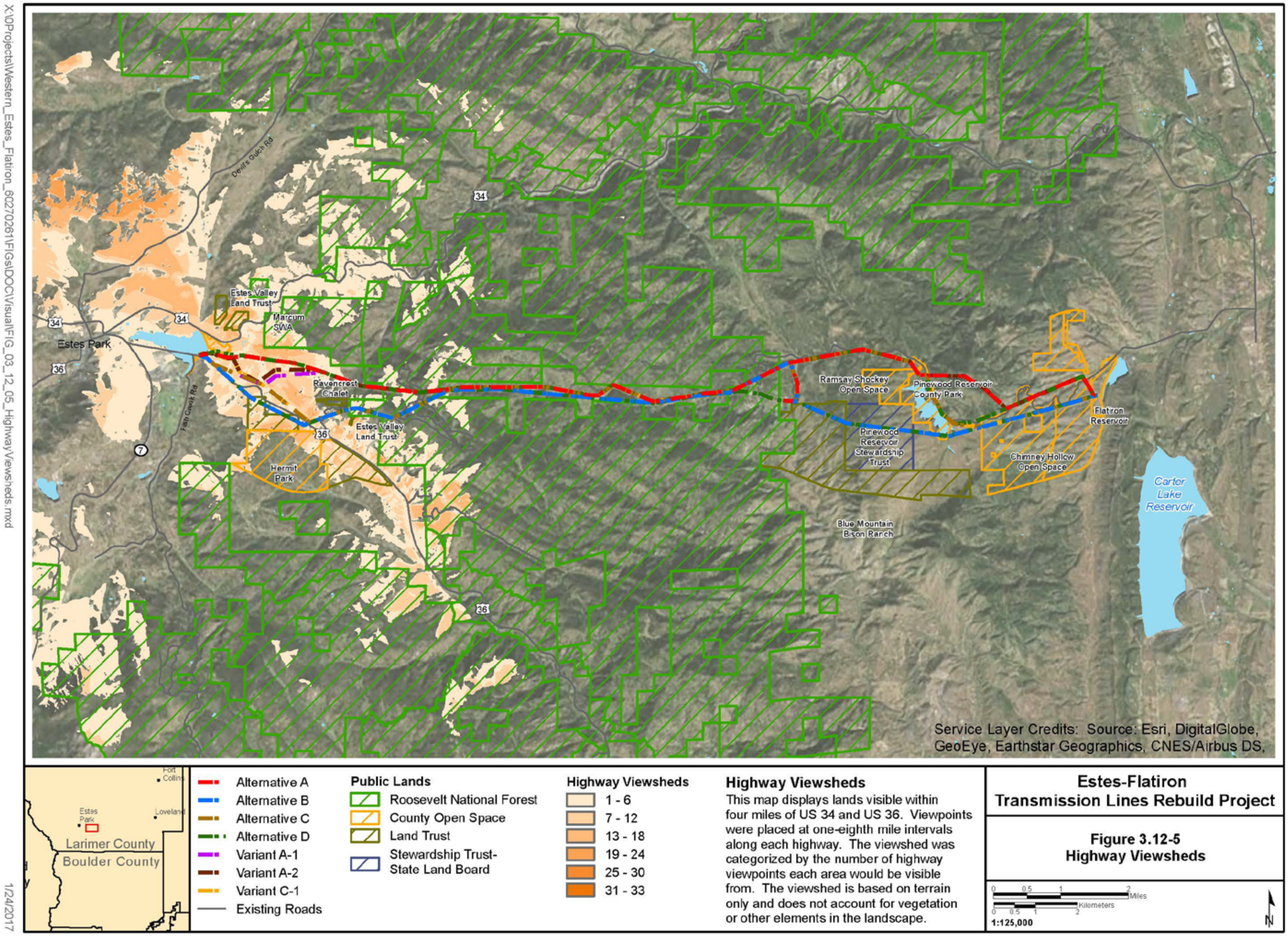
Distance Zones

Distance zones from the Project are identified from each sensitive use area in **Table 3.12-4**. The Project and existing 115-kV lines are within the foreground viewing distance zone of many of the sensitive use areas.

3.12.2.3 Forest Service Scenic Integrity Objectives

The types, scales, and patterns of existing development on public and private land are the primary factors considered in determining Existing Scenic Integrity as discussed in the section *Landscape Character Units, Scenic Attractiveness, Existing Scenic Integrity, and Visual Absorption Capability*. The desired future condition is expressed as SIOs as contained in the USFS's 1997 Revision of the Land and Resource Management Plan, Arapahoe and Roosevelt National Forests and Pawnee National Grassland (USFS 1997a).

SIOs are long-term objectives that have been determined to have a 20-year threshold (USFS 2013b). Scenic effects that occur less than 20 years are defined as "short-term" and are not seen as affecting the SIO as adopted in the Forest Plan.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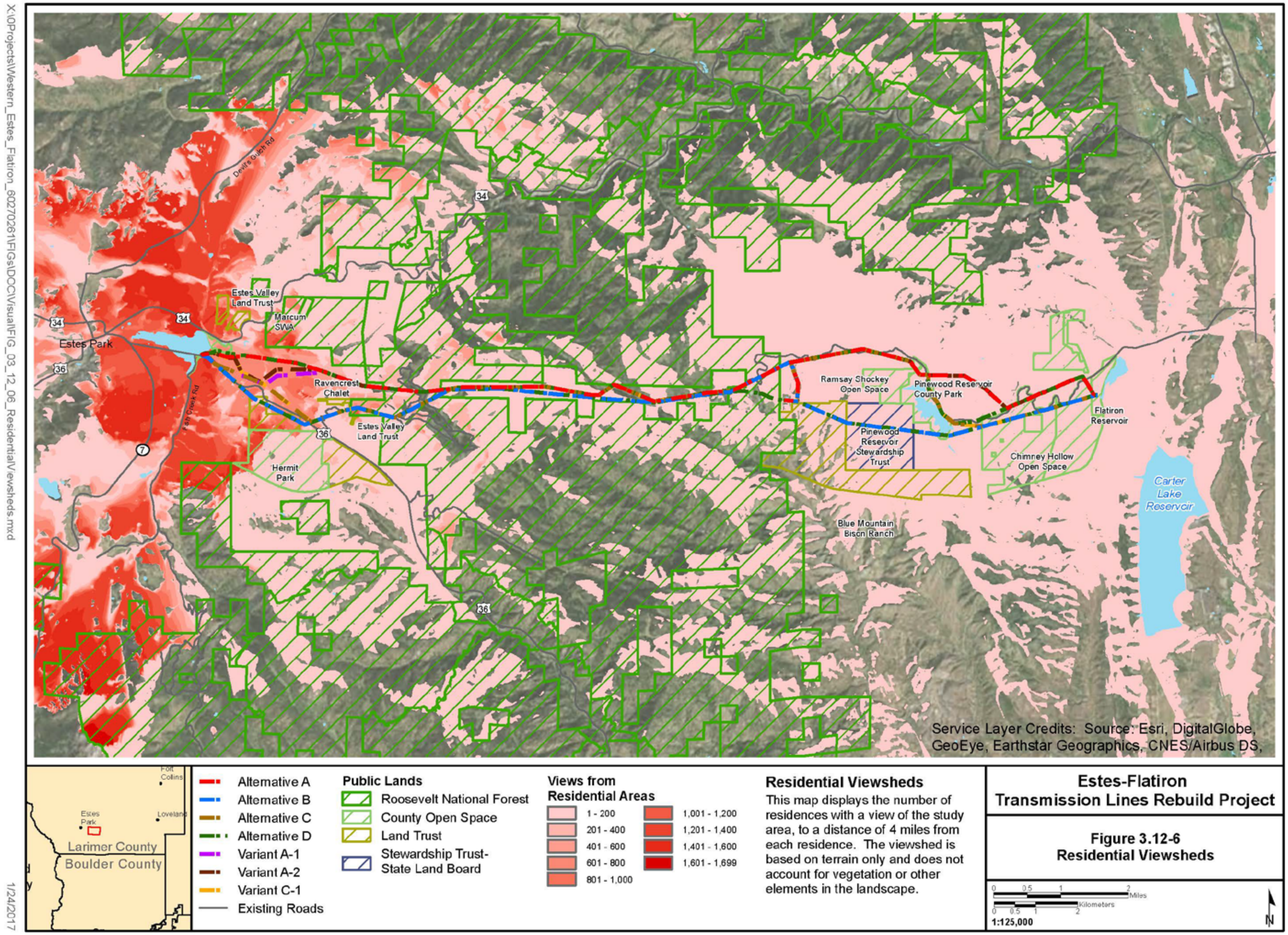
1/24/2017
Devils Gulch Rd
34
Estes Valley Land Trust
Marcum SWA
Estes Park
36
7
Fish Creek Rd
Ravencrest Chalet
Estes Valley Land Trust
Hermit Park
Ramsay Shockey Open Space
Pinewood Reservoir County Park
Pinewood Reservoir Stewardship Trust
Flatiron Reservoir
Chimney Hollow Open Space
Carter Lake Reservoir
Blue Mountain Bison Ranch
Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS,
Fort Collins
Loveland
Estes Park
Larimer County
Boulder County
Alternative A
Alternative B
Alternative C
Alternative D
Variant A-1
Variant A-2
Variant C-1
Existing Roads
Public Lands
Roosevelt National Forest
County Open Space
Land Trust
Stewardship Trust-State Land Board
Highway Viewsheds
1 - 6
7 - 12
13 - 18
19 - 24
25 - 30
31 - 33
Highway Viewsheds
This map displays lands visible within four miles of US 34 and US 36. Viewpoints were placed at one-eighth mile intervals along each highway. The viewshed was categorized by the number of highway viewpoints each area would be visible from. The viewshed is based on terrain only and does not account for vegetation or other elements in the landscape.
Estes-Flatiron Transmission Lines Rebuild Project
Figure 3.12-5
Highway Viewsheds
Miles
Kilometers
1:125,000
N


Devils Gulch Rd
34
Estes Valley Land Trust
Marcum SWA
34
Estes Park
36
Fish Creek Rd
7
Ravencrest Chalet
Estes Valley Land Trust
36
Hermit Park
Ramsay Shockey Open Space
Pinewood Reservoir County Park
Pinewood Reservoir Stewardship Trust
Flatiron Reservoir
Chimney Hollow Open Space
Carter Lake Reservoir
Blue Mountain Bison Ranch
36
Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS,
Larimer County
Boulder County
Alternative A
Alternative B
Alternative C
Alternative D
Variant A-1
Variant A-2
Variant C-1
Existing Roads
Public Lands
Roosevelt National Forest
County Open Space
Land Trust
Stewardship Trust-State Land Board
Views from Residential Areas
1 - 200
201 - 400
401 - 600
601 - 800
801 - 1,000
1,001 - 1,200
1,201 - 1,400
1,401 - 1,600
1,601 - 1,699
Residential Viewsheds
This map displays the number of residences with a view of the study area, to a distance of 4 miles from each residence. The viewshed is based on terrain only and does not account for vegetation or other elements in the landscape.
Estes-Flatiron Transmission Lines Rebuild Project
Figure 3.12-6
Residential Viewsheds
Miles
Kilometers
1:125,000
N
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1/24/2017

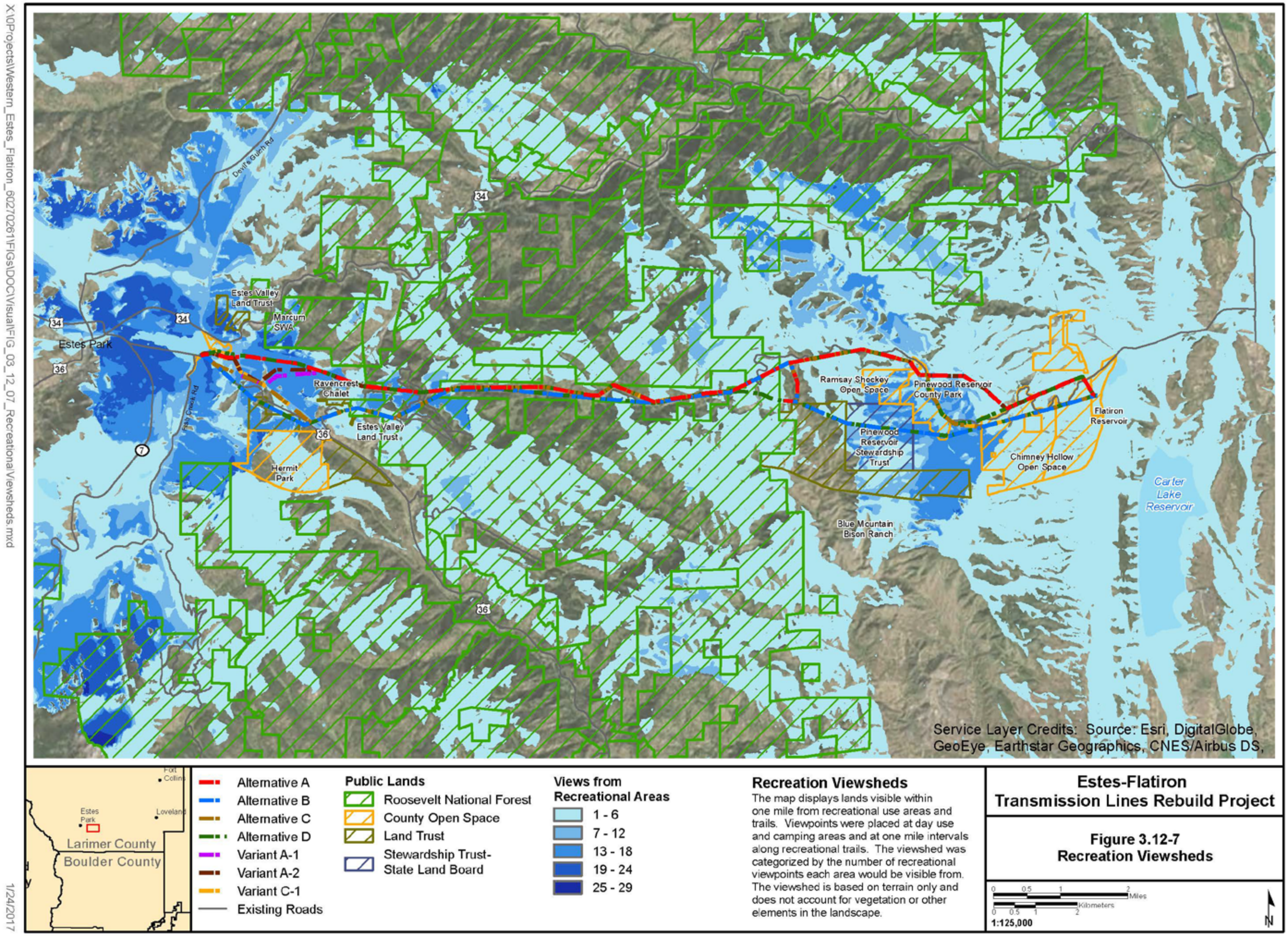


Figure 3.12-7
Recreation Viewsheds

Table 3.12-4 Summary of Landscape Visibility

Location Name	Type and Volume of Use	Distance Zone to Project ROW
Travelways		
U.S. Highway 34/Big Thompson Avenue Major travel route to Rocky Mountain National Park	Primary Travelway High Use	FG/MG
U.S. Highway 36 Major travel route to Rocky Mountain National Park	Primary Travelway High Use	FG/MG
Pole Hill Road (USFS Road122) Access to National Forest System lands; off-road-vehicle use, cross-country skiing, hiking, mountain biking, dispersed recreational activities, and residences. Closed to public access between Section 36, T5N R72W to Section 25, T5N R71W.	Secondary Travelway Moderate to Low Use	FG
Pole Hill Road (West County Road 18E) – near Pinewood and Flatiron Reservoir: Biking	Secondary Travelway Moderate Use	FG
Greenwood Drive – near Pinewood Reservoir; Residential	Secondary Travelway Moderate Use	FG/MG
Trail Ridge / Beaver Meadow Road. Primary travel route through RMNP and nationally designated as an All-American Road	Primary Travelway High Use	MG/BG
Peak to Peak Scenic Byway (Highway 7). Primary travel route to Rocky Mountain National Park and designated as a scenic byway by the State of Colorado and USFS	Primary Travelway High Use	MG/BG
Park and Recreation Areas		
Rocky Mountain National Park	Primary Use Area High Use	MG/BG
Lake Estes Park	Primary Use Area High Use	FG/MG
Estes Park Visitor Center	Primary Use Area High Use	MG
Estes Park Overlook, U.S. Highway 36	Primary Use Area High Use	FG
Lake Estes Trail	Primary Use Area High Use	FG/MG
Fall River Trail	Primary Use Area High Use	MG/BG
Fish Creek Trail	Primary Use Area High Use	MG/BG
Riverwalk Trail	Primary Use Area High Use	MG
Round Mountain National Recreation Trail	Primary Use Area High Use	MG
Pole Hill/Panorama Peak/Solitude Creek Peak/The Notch	Secondary Use Area Low Use	FG
Pinewood Reservoir, Picnic Area and Ramsay-Shockey Open Space and trail system	Secondary Use Area Moderate Use	FG/MG

Table 3.12-4 Summary of Landscape Visibility

Location Name	Type and Volume of Use	Distance Zone to Project ROW
Flatiron Reservoir Campground	Secondary Use Area Moderate Use	FG/MG
Chimney Hollow Open Space, Larimer County	Secondary Use Area Moderate Use	FG
Residential		
Meadowdale Hills subdivision	Secondary Use Area Moderate Use	FG
Ravencrest Heights subdivision	Secondary Use Area Moderate Use	FG
Pole Hill subdivision	Secondary Use Area Moderate Use	FG
Greenwood Drive/Newell Lake View subdivision	Secondary Use Area Moderate Use	FG/MG
Park Hill subdivision	Secondary Use Area Moderate Use	FG
Dispersed rural residential – Pole Hill Road	Secondary Use Area Low Use	FG
Cultural Sites		
Stanley Hotel	Primary Use Area High Use	MG

FG = foreground, MG = middleground, BG = background.

The existing North and South lines are included in one utility corridor (USFS 2012a). On National Forest System land, the existing 115-kV transmission lines are included within Utility Corridor Management Area 8.3 within the Elk Ridge Geographic Area. The Forest Plan's desired condition for Utility Corridors, is for "vegetation composition and structure to be altered to meet the needs of the site (e.g., larger trees are removed to allow for a safety area below and to the side of power lines; smaller trees are still present; and other areas have been cleared of all trees to accommodate facilities). The boundaries of the cut areas bordering the utility corridor are blended into the surrounding vegetation. Human development is obvious and may dominate the foreground views. An extensive road system exists throughout most of the area for purposes of allowing access for maintenance of the utility" (USFS 1997a).

Guideline number two in Management Area 8.3 suggests that "Utility Corridors and electronic sites will be located and designed to blend with the landscape. They will be compatible with the SIOs of adjacent management areas" (USFS 1997a). According to guideline number two, uses within the Utility Corridor will be compatible with adjacent management areas (USFS 1997a). Management areas adjacent to the utility corridor in the Elk Ridge Geographic Area include only Management Area 3.5 (Forested Flora or Fauna Habitats-Limited Management). Goals and desired conditions emphasize wildlife habitat and non-motorized recreation.

The USFS's SIO for the Elk Ridge area is Moderate as shown in **Figure 3.12-8** (USFS 2006, 1997a).Moderate refers to landscapes where the valued landscape character 'appears slightly altered'. Noticeable deviations must remain visually subordinate to the landscape character being viewed (USFS 2006). The Forest Plan provides examples of projects that would meet Moderate: "A power line that uses flat, low reflectivity, natural colors that blend with the background could meet this level, as could irregularly shaped timber harvests with some trees left and feathered edges, or ski slopes in areas with natural openings that allow some blending" (USFS 2006, 1997a).

Forest Plan Guideline 157 is to "design and implement management activities to meet the adopted scenic integrity objective for the area as shown on the SIO Map." Similarly, Forest Plan Standard 154 prohibits "management activities that are inconsistent with the scenic integrity objective unless a decision is made to change the scenic integrity objective. A decision to change the scenic integrity objective will be documented in a Project level NEPA decision document" (USFS 1997a).

3.12.2.4 State and Local Visual Resource Guidance

State or local government visual resource standards or policies for visual resources in the analysis area include scenic byway management plans prepared by Colorado Department of Transportation, and comprehensive plans prepared by Larimer County. None of these plans contain design requirements for transmission lines.

<u>State of Colorado</u>

Two scenic byways to and through Rocky Mountain National Park are within the viewshed of the Project, the Trail Ridge / Beaver Meadows Road and the Peak to Peak Scenic Byway (Highway 7). The Trail Ridge / Beaver Meadows Road was designated in 1996 as an All-American Road, the highest level of national designation. It travels east-west from Estes Park through Rocky Mountain National Park, beginning 1.7 miles from the Project. The Peak to Peak scenic byway travels north-south to Estes Park, 0.8 mile from the Project.

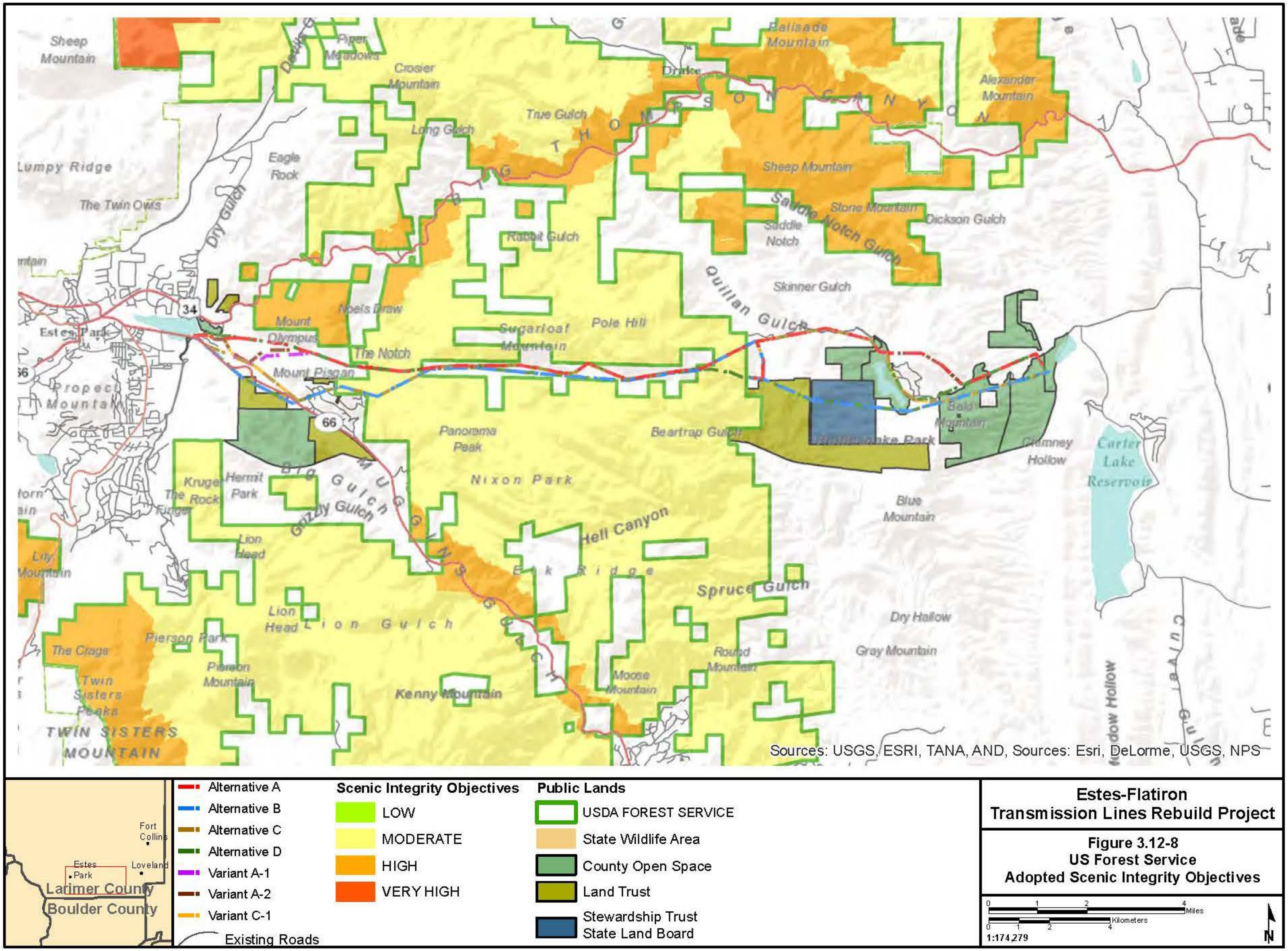
<u>Larimer County and Estes Valley</u>

Section 6.8 Special Places: Archaeological, Cultural and Aesthetic Resources of the Larimer County Master Plan requires that development plans identify historic landmarks, geological features, and unique aesthetic features in recognition of their irreplaceable character and importance to the quality of life in the County (Larimer County 1997). With exception of the Open Lands Program, below, the Master Plan and other County plans, policies, and codes do not address protection of visual resources in the analysis area.

Larimer - Blue Mountain Conservation Area is a priority area for the Larimer County Open Lands Program due to its scenic quality, recreation uses, wildlife, and vegetation communities. Conserved properties in the Blue Mountain Conservation Area include the 4,100-acre Blue Mountain Bison Ranch Conservation Easement, the 1,847-acre Chimney Hollow Open Space, the Harper Conservation Easement and the 177-acre Ramsay-Shockey Open Space adjacent to Pinewood Reservoir.

Larimer County and the Town of Estes Park cooperated in preparing the Estes Valley Comprehensive Plan which encompasses the Estes Park Landscape Character Unit (Larimer County 1996). The Comprehensive Plan is currently being revised; a new plan is anticipated by 2017. Policies emphasize the importance of scenic quality as a basis for the Valley's quality of life, economic development, tourism, and recreation and include the following:

- 6.2 Protect the scenic character and visual quality of the open space and gateway experience to the Valley and Rocky Mountain National Park.
- 6.6 Ensure that new development minimizes the impacts to visual and environmental quality within the Valley.
- 6.7 Avoid development on sky lined ridgelines.
- 6.12 Work with landowners and appropriate agencies to reduce the threat of wildfires.


Sheep Mountain
Lumpy Ridge
The Twin Owls
Estes Park
Crosier Mountain
Piper Meadows
Eagle Rock
Dry Gulch
Long Gulch
True Gulch
Drake
Palisade Mountain
Alexander Mountain
BIG THOMPSON CANYON
Sheep Mountain
Stone Mountain
Saddle Notch
Saddle Notch Gulch
Dickson Gulch
Rabbit Gulch
Skinner Gulch
Quillan Gulch
Mount Olympus
Noels Draw
The Notch
Sugarloaf Mountain
Pole Hill
Mount Pisgah
Panorama Peak
Beartrap Gulch
Bald Mountain
Chimney Hollow
Carter Lake Reservoir
Nixon Park
Hermit Park
Kruger Rock
The Finger
Big Gulch
Grizzly Gulch
Lion Head
Hell Canyon
Blue Mountain
Elk Ridge
Spruce Gulch
Dry Hollow
Gray Mountain
Lion Gulch
Pierson Park
Pierson Mountain
Lily Mountain
The Crags
Twin Sisters Peaks
TWIN SISTERS MOUNTAIN
Kenny Mountain
Round Mountain
Moose Mountain
Meadow Hollow
Culver Gulch
Muggins Gulch
34
66
Sources: USGS, ESRI, TANA, AND, Sources: Esri, DeLorme, USGS, NPS
Fort Collins
Estes Park
Loveland
Larimer County
Boulder County
Alternative A
Alternative B
Alternative C
Alternative D
Variant A-1
Variant A-2
Variant C-1
Existing Roads
Scenic Integrity Objectives
LOW
MODERATE
HIGH
VERY HIGH
Public Lands
USDA FOREST SERVICE
State Wildlife Area
County Open Space
Land Trust
Stewardship Trust State Land Board
Estes-Flatiron Transmission Lines Rebuild Project
Figure 3.12-8 US Forest Service Adopted Scenic Integrity Objectives
0 1 2 4 Miles
0 1 2 4 Kilometers
1:174,279
N

Ridgeline protection areas have been designated at the entrances to the valley. Developments in these areas require a special review process. The Project does not cross a designated ridgeline protection **area.**

3.13 Socioeconomics and Community Resources (including Environmental Justice)

The purpose of the socioeconomic analysis is to address the economic impacts of the Project alternatives, including employment and labor income, on the major sectors of the local economy and to examine potential impacts to property values. Particular emphasis focuses on the reliability of the electrical system and short-term construction impacts as related to the tourism industry.

3.13.1 Affected Environment

Larimer County is located in north-central Colorado. It is the seventh most populated county in Colorado. The county extends to the Continental Divide and includes several mountain communities and Rocky Mountain National Park. The county encompasses 2,640 square miles that include vast stretches of scenic ranch lands, forests, and high mountain peaks. Over 50 percent of Larimer County is publicly owned, most of which is land within National Forest and Rocky Mountain National Park. In addition to these Federal lands, Colorado State Parks, Larimer County Parks and Open Lands, and local parks within urban areas combine to provide a wide spectrum of recreational opportunities that are enjoyed by both residents and visitors. The towns of Loveland and Estes Park also are known as gateways to Rocky Mountain National Park, which receives over 3 million visitors each year.

The Project vicinity lies entirely within Larimer County and within close proximity to Loveland and Estes Park; these areas are the focus of the following social and economic analysis. The portion of the system affected by this transmission system includes approximately 45,000 customers in the area, including the towns of Loveland (32,574 customers) and Estes Park (10,500 customers). These customers are directly serviced by the Platte River Power Authority. However, the Platte River Power Authority purchases a portion of its power from Western. Also included are rural areas along Pole Hill Road supplied by Poudre Valley Rural Electric Association, which purchases a portion of its power from Tri-State Generation and Transmission Cooperative. Tri-State also is a Western customer that purchases a portion of its power from Western. Many residents of the county depend directly and indirectly upon recreation-oriented activities for their economic livelihood. Because the demand for recreational activity and second homes in mountain environments continues to grow in Larimer County, electrical service reliability is increasingly important.

3.13.1.1 Demographics

<u>Population</u>

Population and population trends for the Project vicinity are shown on **Table 3.13-1**. Between 2000 and 2011, population increased by 21 percent in Larimer County, 35 percent in Loveland, and 10 percent in Estes Park. Population in Colorado as a whole has increased by 19 percent between 2000 and 2011. Northern Colorado is one of the fastest growing areas in Colorado. Population and demographic data for the two census tracts within the Project vicinity are displayed in **Table 3.13-8**.

Table 3.13-1 Population Growth in the Project Vicinity

	2000	2005	2010	2011 (estimate)	Average Annual % Increase 2000-2011	% Increase
State of Colorado	4,301,261	4,662,534	5,050,870	5,116,796	1.7	19
Larimer County	251,494	275,873	300,637	305,525	1.9	21
Loveland	50,608	60,346	67,083	68,203	3.2	35
Estes Park	5,413	5,618	5,878	5,976	0.9	10

Source: Colorado Department of Local Affairs 2012, U.S. Census Bureau 2012a.

The Estes Valley includes the Town of Estes Park and the surrounding outlying areas east, north and south of Rocky Mountain National Park. The population in the Estes Valley is estimated at over 12,000, with an estimated additional second home owner population of 5,340 (RRC Associates, Inc. and Rees Consulting, Inc. 2008). Rocky Mountain National Park receives over 3 million visitors annually (National Park Service 2013b). Many of these visitors stay in the over 150 lodging establishments throughout the area, adding to the population base of the resident and second home owners.

The race composition of the Project vicinity is predominately White (92.8 percent), with Hispanics representing approximately 10.8 percent of the total population in the area (U.S. Census Bureau 2012a).

Employment and Income

The Project vicinity has a diverse economic base, with the greatest percentages of total employment occurring in services, government, and health care. Loveland has a strong and diverse economic base and is home to many bioscience and high tech companies, as well as regional retail and wholesale centers and health care providers. Important industries include tourism-related sales and services in the Estes Park area. Estes Park is the gateway to Rocky Mountain National Park and is an international destination resort. The town is primarily a summer resort; the vacation and festival season runs from Memorial Day into October. The goods and services sectors are the primary economic generators in the Estes Valley.

Employment and unemployment for 2012 in Larimer County and the state of Colorado is shown in **Table 3.13-2**. The unemployment rate in Larimer County was lower at 6.0 percent in November 2012 compared to the state unemployment rate of 7.5 percent. It appears that the Larimer County unemployment rate has steadily declined over the past year and that the labor force has slowly increased. Depending on economic conditions and the speed in recovering from the economic recession of 2008, these unemployment rates may remain somewhat static for the near future.

Important employment sectors in the Project vicinity include the tourism-related sectors of accommodations and food services, education, health care, retail trade, manufacturing, and professional and technical services. One tourism-related permittee operates four-wheel drive/off-road tours with the most challenging four-wheel drive section of the route being the steep, rocky section just east of the road closure gate on Pole Hill Road in the Pole Hill area.

Table 3.13-2 Labor Force Summary January 2012 and Average Annual 2011

County	Labor Force	Employed	Unemployed	% Unemployed
Larimer County (November 2012)	180,009	169,283	10,726	6.0
State of Colorado (November 2012)	2,713,371	2,509,051	204,320	7.5
Larimer County (2011)	170,830	158,736	12,094	7.1
State of Colorado (2011)	2,734,416	2,507,786	226,630	8.3

Source: Colorado Department of Labor and Employment 2012.

The concentration of tourism-related sectors is significant, in part, because these sectors pay relatively low wages. **Table 3.13-3** shows the number of establishments, employment, and wages for Larimer County in 2010. Average weekly wages for arts, entertainment, recreation, food and accommodations are some of the lowest wages for all sectors. Construction weekly wages of $864 would be considered moderate.

Median household income for the 2007 to 2011 timeframe was estimated at $57,587 for Estes Park and $54,763 for Loveland (U.S. Census Bureau 2012b).

Table 3.13-3 Employment and Wages, Total Data for Larimer County, Aggregate of All Types based on 2010 Quarterly Census

Industry	Average Number of Establishments	Average Employment	Average Weekly Wage
Total, all industries	10,029	126,658	$785
Agriculture, forestry, fishing and hunting	76	613	$544
Mining	36	308	$886
Utilities	32	716	$1,318
Construction	1,186	7,273	$864
Manufacturing	422	10,582	$1,418
Wholesale trade	583	2,890	$1,021
Retail trade	1,174	16,528	$455
Transportation and warehousing	176	2,416	$749
Information	178	2,709	$937
Finance and insurance	536	3,178	$980
Real estate and rental and leasing	501	2,228	$608
Professional and technical services	1,694	8,798	$1,335
Management of companies and enterprises	73	508	$1,632
Administrative and waste services	583	8,191	$556
Educational services	144	15,409	$752
Health care and social assistance	878	16,668	$819
Arts, entertainment, and recreation	177	2,489	$440
Accommodation and food services	758	14,223	$282

Table 3.13-3 Employment and Wages, Total Data for Larimer County, Aggregate of All Types based on 2010 Quarterly Census

Industry	Average Number of Establishments	Average Employment	Average Weekly Wage
Other services, ex. public administration	753	3,452	$540
Public administration	62	7,445	$1,062
Unclassified	10	33	$1,159

Source: U.S. Bureau of Labor Statistics 2012.

Employment Seasonality

Employment in the Estes Valley fluctuates significantly with the season. Results from a 2007 employer survey indicate that just over half of the workforce during the summer months is seasonal. Employment drops significantly during the winter months with approximately 3,366 people holding year-round positions and 950 employed in seasonal jobs. Survey data indicate that winter employment as a percent of summer employment has remained between 58 and 64 percent since 1989 (RRC Associates, Inc. and Rees Consulting, Inc. 2008). **Table 3.13-4** shows seasonal employment in the Estes Valley.

Table 3.13-4 Seasonality in Employment, Estes Valley

	Total Summer	Total Winter	Average
Number of employees	6,857	4,316	5,587
Number of year-round employees	3,360	3,366	3,364
Number of seasonal employees	3,497	950	2,223
Percent seasonal	51%	22%	40%

Source: RRC Associates, Inc. and Rees Consulting, Inc. 2008.

Surveys asked employers to estimate the percentage of seasonal employees who return to work for them from past seasons. Employers reported that an average of 46 percent of summer seasonal employees and 18 percent of winter seasonal employees returned to work for them from previous seasons; therefore, the majority of seasonal employees must be newly recruited each year.

Housing

Adequate housing throughout the Project vicinity exists for permanent and temporary accommodations. Temporary accommodations in the Estes Valley are provided by over 150 lodging establishments. The City of Loveland provides temporary accommodations such as motels, hotels, bed and breakfasts, cabins, and recreational vehicle camping sites.

In 2011, there were an estimated total of 133,263 housing units in Larimer County, of which 78,924 units were owner occupied; 42,987 units were renter occupied; and the remainder were vacant (**Table 3.13-5**). In the Estes Valley, many vacant units are used for seasonal use or occasional use. These units include those that are owned by non-residents (second homes) as well as seasonal and recreational rentals. Seasonal homes are a small percent of the total housing units in Colorado, including Loveland. However, in the Estes Valley, these homes make up 34 percent of total housing units.

Table 3.13-5 Housing Availability and Vacancy Rates - State of Colorado, Larimer County, Loveland, and Estes Park

	Colorado 2011	Larimer County 2011	Loveland 2011	Estes Park 2011	Estes Valley 2006
Total housing units	2,224,661	133,263	30,137	4,004	6,544
Vacant housing	249,273	11,352	1,610	1,138	2,225
Vacancy rate	11.2%	9.9%	5.3%	28.4%	34%
Occupied	1,975,388	121,911	28,527	2,866	NA
Owner occupied	1,271,804	78,924	17,178	1,892	4,456
Renter occupied	703,584	42,987	11,349	974	NA
Seasonal units	NA	NA	NA	NA	2,225
% seasonal	NA	NA	NA	NA	34%

NA = not applicable.

Source: RRC Associates, Inc. and Rees Consulting, Inc. 2008; U.S. Census Bureau 2012a,b.

This level of second homes or absentee homeowners can have an impact on the local economy and community. In some cases, second homes provide a variety of service job opportunities within the community. But these homes also tend to be somewhat remote from the urban center, and can often cost the local government more in services (fire, sheriff, etc.) than they receive in taxes. Second homeowners are not counted in census figures but require government facilities and services when they are in the area. Assuming a 2.4-person household size (average household size of an owner-occupied unit in 2000 census) for second homeowners, an additional 5,340 people live in the Estes Valley area for a portion of the year.

Housing prices in Loveland and Estes Park have increased as shown in **Table 3.13-6**. However, during the period 2001 through 2010, market activity and home prices have fluctuated, particularly after the peak period of 2006 and 2007. The economic recession in 2008 had a dampening effect on new construction, but sales activity for existing housing has only declined slightly and is on the upswing.

Table 3.13-6 Residential Sales in Loveland and Estes Park

	Loveland			Estes Park		
	2001	2008	2011	2001	2008	2011
Homes sold	1,711	1,415	1,423	121	190	209
Median sales price	$185,000	$217,000	$215,000	$260,000	$339,000	$313,000
Land sold	103	76	123	47	41	30
Median sales price	$170,000	$125,000	$159,750	$107,500	$140,000	$133,000

Source: Larimer County 2012d.

The majority of the residential units in the Estes Valley house local residents. However, the percentage of second/vacation homes is increasing. According to Colorado Department of Local Affairs, approximately 34 percent of the units in the Estes Valley are vacant, up from 31 percent in 2000. Of these, most are second homes and vacation accommodations occupied only for seasonal or occasional use.

Within the immediate Project vicinity, there are approximately 88 residential owners adjacent to the ROW. There also are rural residential and residential subdivisions located within the Project vicinity either adjacent to the ROW or in close proximity. The subdivisions generally are located on the eastern or western end of the Project vicinity.

Residential subdivisions on the east side of the Project vicinity include Newell Lake View subdivision located north of Pinewood Reservoir; Pittington subdivision located just west of Flatiron Reservoir on the north side of County Road 18E; and Yelek, Dallas Benton, and Slota subdivisions, all located near Flatiron Reservoir and County Road 31.

Subdivisions on the west side of the Project vicinity near Estes Park include Park Hill subdivision, Ravencrest Heights, and Meadowdale Hills. The largest subdivision is the Meadowdale Hills subdivision, which consists of 165 residential lots ranging in size from one to four acres. Meadowdale Hills, an unincorporated subdivision, is located along the South Line on the north side of U.S. Highway 36, approximately 5 miles outside of the Town of Estes Park. The Larimer County Assessor's data shows that 121 of the lots have been improved (developed). The Park Hill subdivision also is a single family subdivision within proximity of the existing transmission lines and has approximately 20 single family homes in the subdivision. Both the Meadowdale Hills and Park Hill subdivisions have a number of second home owners. **Table 3.13-7** shows the range of residential values of the properties located within the subdivisions based on the county assessor records. These values may or may not reflect actual market values. Typically assessor values tend to be lower than market values but this is not always the case.

3.13.1.2 Public Services

Public services throughout the Project vicinity are provided by various private and public entities, including counties, municipalities, special districts, and private interests. Because of the minimal level of population impacts expected during the construction phase of the Project, only public facilities that might potentially be impacted by accidents during transmission line construction are covered in this section. It is assumed that all necessary public services and facilities are available within the Project vicinity. In all cases, adequate capacities and service levels exist.

In Larimer County, public services are provided by the county and the incorporated towns or special districts. The Upper Thompson Sanitation District was formed in 1971 and provides wastewater treatment service for the areas surrounding the Town of Estes Park. The plant was constructed in 1976 and is located on the western end of the Project vicinity. Larimer County, municipal governments, and special districts provide general government and administrative services, sheriff and police protection, road and bridge construction and maintenance, ambulance and fire protection, medical services, and social services.

Loveland and Estes Park provide various city/town services for their local residents. Service capacities generally are adequate for the existing population in all towns. Loveland and Estes Park have maintained stable financial situations in spite of the economic downturn.

Public Safety and Fire Protection

Larimer County Sheriff provides public safety throughout Larimer County, with the main office in Fort Collins. The sheriff's department has 374 employees including sheriff, undersheriff, lieutenants, patrols, investigators, patrol deputies, jailers, detention officers, animal control officers, communications officers, and administrative professionals serving a population of 300,000. A satellite office is located in Estes Park with a Sergeant, a Corporal, and four deputies. The Town of Estes Park has an estimated population of 5,976; however, the Estes Valley has a total population of over 12,000.

The Loveland Police Department has a staff of 117 department members in operations (patrol services), support, investigative and detective services, business, information, and professional standards. The

Estes Park Police Department has a total 23 full time employees including patrol division, community services, and dispatch.

The Loveland Rural Fire Protection District is served by the Loveland Fire Rescue Authority crews and works in partnership in the Big Thompson Canyon area with the Big Thompson Volunteer Fire Department. Loveland Fire Rescue Authority has a three tier work force of full time paid firefighters and fire officers, part time paid firefighters, and volunteer firefighters. The minimum staffing is three crews with three full time personnel, three crews with two full time personnel; the remaining part time or volunteer firefighter staff is utilized to augment the two person crews as available. The staff consists of 80 career members and approximately 20 volunteer firefighters.

The Loveland Fire Rescue Authority and Rural Fire Protection District work collaboratively with Thompson Valley Emergency Medical Services to provide medical care. It also works in partnership with the fire jurisdictions surrounding Loveland, utilizing both automatic and mutual aid for multiple fire crew response to mitigate emergency incidents. Loveland Fire Rescue Authority has 9 fire stations strategically placed within the 190 square miles of the district boundaries, thus maximizing the ability to respond as efficiently and effectively as possible during an emergency. This includes three stations in the Big Thompson Canyon.

The Estes Valley Fire Protection District is comprised of five District Board Members, the Estes Park Volunteer Fire Department & Dive Team, Fire Chief, Training Captain, Fire Marshal, Administrative Assistant, and 21 fire fighters. The Estes Valley Fire Protection District serves a portion of southwestern Larimer County and the Town of Estes Park, encompassing a 66.3-square-mile area. There are two fire stations that serve the Estes Valley community.

McKee Medical Center and Medical Center of the Rockies provide full service hospital service to Loveland and northern Colorado. In addition, Estes Park is served by the Estes Park Medical Center, a 25-bed critical access acute care facility with a 24-hour emergency department, 24-hour ambulance service, emergency air transport, medical/surgical services, obstetrics, home health care, and hospice. The ambulance department is owned by the hospital and provides 24-hour-a-day advanced life support to the community, and responds to approximately 1,500 calls per year.

Thompson Valley Emergency Medical Services operates 10 advanced life support ambulances and has a staff of 55 including three captains and three lieutenants. The District covers 450 square miles located in the southeast corner of Larimer County including the City of Loveland and the Project vicinity (approximately 100,000 people).

Table 3.13-7 Residential Values in Subdivisions within the Project Vicinity

Subdivision	Undeveloped Lots	Developed Lots	Total Residential	Use Type	Range of Residential Values	Location
East End near Loveland						
Yelek	2	8- Farm	4	Residential, Farm Utility, Industrial	$300,000 to $1 million+	East of Flatiron Reservoir
Slota	0	1	1	Residential	$246,000*	West of S County Road 31
Dallas Benton	0	1	1	Residential	$196,000*	West of S County Road 31
Pittington	17	4	4	Residential and Grazing Land	$490,000 to $624,100	West of Flatiron Reservoir
Newell Lake View[1]	9	42	38	Single Family, Duplex, Storage	$178,500 to $710,000	North of Pinewood Reservoir
West End near Estes Park						
Meadowdale Hills	44	121	165	Single Family Residential	$115,700 to $715,000	North of U.S. Highway 36 off Pole Hill Road
Ravencrest Heights	5	7	12	Single Family Residential	$145,800 to $595,000	Same vicinity as Meadowdale Hills
Park Hill	3	20	23	Single Family Residential	$141,700 to $703,400	Near Mall Road

[1] Not included are 18 residential lots located adjacent of the Newell Lake View Subdivision.

* No price range since the value pertains to one property.

Source: Larimer County 2016; Larimer County Assessor 2012a.

3.13.1.3 Environmental Justice

Under EO 12898 (FR 1994), Federal agencies are required to identify and address disproportionately high or adverse human health or environmental effects of their programs, policies, and activities on minority populations and low-income populations. A specific consideration of equity and fairness in resource decision-making is encompassed in the issue of environmental justice. As required by law and Title VI, all Federal actions will consider potentially disproportionate negative impacts on minority or low-income communities.

Minimal minority populations are located within the Project vicinity. Income levels throughout the Project vicinity are diverse. Median household income from the 2007 to 2011 timeframe was estimated at $57,587 for Estes Park and $54,763 for Loveland (U.S. Census Bureau 2012a).

The most recent poverty status statistics are from 2011 U.S. Census Bureau data. These data showed poverty status for 14.2 percent of the population in Larimer County, 11.6 percent in Loveland, 5.6 percent in Estes Park, and 13.5 percent for the State of Colorado (U.S. Census Bureau 2012a). Low income areas are dispersed throughout the region including the Project vicinity. People with poverty status may reside along the route, but not in disproportionate numbers. **Table 3.13-8** highlights demographic statistics for identifying potential areas of concern.

Table 3.13-8 2011 Census Community Statistics for Environmental Justice Analysis

Population	Larimer County	Loveland	Estes Park (2007-2011)	State of Colorado	Census Tract 28.01*	Census Tract 19.03*
Total population (2011 estimated)	305,525	68,203	5,976	5,116,796	3,135	3,703
% below poverty	14.2	11.6	5.6	13.5	7.0	2.9
% White	92.7	88.6	98.1	87.4	94.3	97.2
% Black	1.5	1.9	0.3	5.0	0.4	0
% American Indian	1.8	1.9	2.0	2.3	0.2	0
% Asian	2.9	5.1	0	3.7	0	2.6
% Native Hawaiian or Pacific Islander	0.2	0	0	0.3	0	0
% persons reporting more than one race	1.7	1.1	1.2	3.4	4.4	0.2
% Hispanic origin	10.8	9.5	7.2	20.9	3.5	0.9

* Census Tract 28.01 encompasses the Town of Estes Park. Census Tract 19.03 encompasses the remainder of the Project vicinity.

Source: U.S. Census Bureau 2012a.

3.14 Electrical Effects and Human Health

3.14.1 Affected Environment

Electrical effects and related human potential health issues described in this section include public health concerns regarding long-term exposures to EMF and corona effects.

Current and voltage are required to transmit electrical energy over a transmission line. Current is flow of an electrical charge measured in amperes and is the source of a magnetic field. Voltage represents the potential for an electrical charge to do work expressed in units of volts or kV and is the source of an electrical field. The electrical effects of the proposed 115-kV transmission lines rebuild can be characterized as “corona effects” and “field effects” that are associated with current-induced magnetic fields and voltage-induced electrical fields.

3.14.1.1 Corona Effects

Corona is the electrical breakdown of air into charged particles caused by the electrical field at the surface of conductors, insulators, and hardware of energized high-voltage transmission lines. Corona occurs where the field has been enhanced by protrusions, such as nicks, insects, or water drops. Transmission line corona varies with atmospheric conditions, being more intense during wet weather. During fair weather, these sources are few and corona is minor. Effects of corona are audible noise, visible light, radio and television interference, and photochemical oxidants.

It has been hypothesized that corona creates ions that can be dispersed by winds, inhaled and deposited on the skin and in the lung leading to adverse human effects (Fews et al. 1999). The Independent Advisory Group on Non-ionizing Radiation (National Radiological Protection Board 2004) concluded that:

> *“…it seems unlikely that corona ions would have more than a small effect on the long-term health risks associated with particulate air pollutants, even in the individuals who are most affected. In public health terms, the proportionate impact will be even lower because only a small fraction of the general population live or work close to sources of corona ions.”*

Subsequent reviews have reaffirmed the lack of correlation between exposure to EMF or corona ions and adverse health effects (Energy Network Association 2009; World Health Organization 2007).

<u>Audible Noise</u>

Corona-generated audible noise generally is characterized as a crackling/hissing noise, most noticeable during wet-weather conditions. There are no design-specific regulations to limit audible noise from transmission lines. Transmission line audible noise is measured and predicted in decibels (A-weighted), or dBA. A typical 115-kV transmission line would produce a noise level of approximately 15.0 dBA at the edge of the ROW (Enterprise Park to Crooked Lane Environmental Assessment 2012). Some typical noise levels are: light automobile traffic at 100 feet, 50 dBA; an operating air conditioning unit at 20 feet, 60 dBA; and freeway traffic or freight train at 50 feet, 70 dBA. This last level represents the point at which a contribution to hearing impairment begins.

<u>Visible Light</u>

Corona can be seen as bluish tufts or streamers surrounding the conductor under conditions of darkness, and probably only with the aid of telescopic devices. Light would be difficult to detect at the operating voltage of 115 kV.

<u>Radio and Television Interference</u>

Radio and television interference stemming from transmission lines are most often caused by damaged, loose, or worn hardware. Additionally, corona-generated radio interference is most likely to affect the amplitude modulated (AM) broadcast band; frequency modulated (FM) radio reception is rarely affected. Only AM-radio receivers near transmission lines are affected by radio interference. An acceptable level of maximum fair-weather radio interference at the edge of a ROW is 40 to 45 decibels above one microvolt per meter. Average levels during foul weather are typically 16 to 22 decibels higher than average fair-weather levels. Television interference due to corona occurs during foul weather and generally is caused by transmission lines with voltage more than 345 kV.

Photochemical Oxidants

When corona is present, the air surrounding the conductors is ionized and many chemical reactions take place, producing small amounts of O_3 and other oxidants. Approximately 90 percent of oxidants are ozone and the rest mainly NO_X.

The NAAQS for photochemical oxidants, of which O_3 is the principal component, is 235 $\mu g/m^3$ or 120 ppb.

3.14.1.2 Electric Fields

The electric field created by high voltage transmission lines extends from the energized conductor to other conducting objects. Resulting field effects include induced current and voltage in the ground, structures, vegetation, buildings, vehicles, and people near the transmission line; spark discharge shocks; steady state current shocks; field perception at ground level; and magnetic field. The electric field or voltage gradient is expressed in units of volts per meter or kV/m.

There are no Federal standards for transmission line electric fields. Several states have set guidelines for EMF levels that must be met for newly constructed transmission lines.

Primary Shocks

The greatest hazard from a transmission line is primary shocks or direct electrical contact with the conductors. Primary shocks can result in physiological harm. The lowest category of primary shocks is “let go,” which represents the steady-state current that cannot be released voluntarily.

Steady-State Current Shocks

Steady-state currents are those that flow when a person contacts an ungrounded object, providing a path for the induced current to flow to the ground. Secondary shocks could cause an involuntary and potentially harmful movement, but cause no direct physiological harm.

Induced Current and Voltage

When a conducting object, such as a vehicle or person, is placed in an electric field, currents and voltages are induced in that object. The magnitude of the induced current depends on the strength of the electric field and the size and shape of the object. Voltage induction and the creation of currents in long conducting objects, such as fences and pipelines, would be possible near the proposed transmission line. If the object is grounded, the induced current flows into the earth and is called the short-circuit current of the object. In this case, voltage on the object is effectively zero. If the object is insulated (not grounded), then it assumes some voltage relative to ground. These induced currents and voltages represent a potential source of nuisance shocks near a high voltage transmission line.

Cardiac Pacemakers

Overall risk to cardiac pacemaker wearers as a result of current and voltage induction warrant individual discussion. Induced current and voltage represent a possible source of interference to pacemakers. Internal currents can be caused by electric fields, magnetic fields, or by direct contact. The interference threshold for the most sensitive pacemaker is estimated at 3.4 kV/m.

Spark-Discharge Shocks

Induced voltage appears on objects that conduct electricity, such as vehicles, fences, and railroad tracks, when there is an inadequate ground. If voltage were sufficiently high, a spark-discharge shock would occur upon contact with the object.

Carrying or handling conducting objects such as irrigation pipe under the proposed line could result in spark discharges that are a nuisance. The primary hazard with irrigation pipe, however, is direct contact with conductors.

Field Perception

When the electric field under a transmission line is sufficiently high, persons standing under or near the line may perceive the raising of hair on an upraised hand.

Magnetic Fields

Magnetic field strength is expressed in terms of teslas or gauss. While electrical fields can be easily shielded or reduced by walls, vegetation, and other objects, magnetic fields are not and they are more likely to penetrate into the body. Typical homes produce background magnetic field levels (away from appliances and wiring) that range from 0.5 mG to 4 mG, with an average value of 0.9 mG. The Colorado Public Utilities Commission states that magnetic field levels of less than 150 mG at the edge of a transmission line ROW are reasonable. The existing 115-kV transmission lines produce magnetic fields of about 5.3 mG at the edge of the ROW when operating at maximum capacity, well below levels set by the Utilities Commission. Magnetic fields fluctuate with the amount of power being transmitted on the lines, while electric fields are related to voltage and thus remain nearly constant. Both fields decrease rapidly with distance.

3.14.1.3 Long-term Exposure to Electric and Magnetic Fields

Questions concerning effects of long-term exposure to electric fields from transmission lines on human health are a controversial subject that has been raised primarily in hearings related to 500-kV and 765-kV transmission lines. These high voltage lines induce electrical fields at ground levels more than twice the maximum electrical field estimated under the proposed 115-kV Estes-Flatiron Transmission Lines Rebuild Project. Although available evidence has not established that induced electrical fields pose a measurable health hazard to exposed humans, the same evidence does not prove there is no hazard. Therefore, in light of the present uncertainty, it is Western's policy to design and construct transmission lines that reduce the EMF to the maximum extent feasible.

While considerable uncertainty remains about the EMF/health effects issue, the following facts have been established from evaluating the results and trends of EMF-related research:

- Any exposure-related health risks to an exposed individual would be small.
- The most biologically significant types of exposures have not been established.
- Most health concerns have been related to magnetic fields.
- The measures employed for field reduction can affect line safety, reliability, efficiency, and maintainability, depending upon the type and extent of such measures.

No Federal regulations have established environmental limits on the strengths of EMF from power lines. Some states have set limits on EMF from newly constructed lines, not based on factual health data. Below are brief summaries of some past and current studies on EMF health studies:

World Health Organization: Electromagnetic Fields (2013) concludes that despite extensive research, to date there is no evidence to conclude that exposure to low level EMF is harmful to human health. Furthermore, current public concern focuses on possible long-term health effects caused by exposure to EMF at levels below those required to trigger acute biological responses.

Electric and Magnetic Fields from 60-Hz Powerlines: What do We Know about Possible Health Risks? (USEPA 1991) concluded that 60-Hz EMF does not pose a significant risk to agriculture, animals, or ecosystems.

The Electric Power Research Institute (1998) (along with the Veterans Affairs Medical Center and the Bonneville Power Administration) conducted a four-phase study that exposed sheep to fields from a 500-kV transmission line. The research was done to determine whether long-term EMF exposures impacted melatonin levels, immune function, and animal health. Early phase studies of exposed groups of animals showed no impact on melatonin levels. In later studies, immune cells were monitored in two exposed groups of animals to find out if exposure to fields resulted in immune cells reduction in the exposed animals. Cell reduction would affect immune function and animal health. Final results showed that immune cells were not consistently or significantly reduced in exposed sheep.

A team of Canadian researchers led by McBride reported in the May 1999 issue of the American Journal of Epidemiology that if there is a risk (of childhood leukemia from EMF exposure) it is undetectable through epidemiological studies.

A study sponsored by the National Institute of Health, National Institute of Environmental Health Sciences (NIEHS) was published in May 1999. The *Report on Health Effects from Exposure to Power-Line Frequency Electric and Magnetic Fields*, stated that all theories concerning biological effects of EMF "suffer from a lack of detailed, quantitative knowledge." It concludes that laboratory data using a variety of animals, such as non-human primates, pigeons, and rodents, are inadequate to conclude that EMF field exposure alters cancer pattern rate and has not been adequately demonstrated for non-cancer health issues (e.g., birth defects) (NIEHS 1999). An additional NIEHS (2002) publication detailing further studies and EMF information is located in **Appendix D** (http://www.niehs.nih.gov/health/materials/electric_and_magnetic_fields_associated_with_the_use_of_electric_power_questions_and_answers_english_508.pdf). As a precaution regarding human health issues, the report recommends that the electrical field at the edge of a ROW measured one meter aboveground not exceed 1-kV per meter, and considered this recommendation conservative.

3.15 Cultural Resources and Native American Traditional Values

Cultural resources are those aspects of the physical environment that relate to human culture, society, and cultural institutions that hold communities together and link them to their surroundings. They include past and present expressions of human culture and history in the physical environment, such as prehistoric and historic sites, buildings, structures, objects, districts, natural features, and biota, which are considered important to a culture, subculture, or community. Cultural resources also include aspects of the physical environment that are a part of traditional lifeways and practices, and are associated with community values and institutions.

3.15.1 Cultural Resource Types

Cultural resources include prehistoric and historic sites and ethnographic resources. Prehistoric sites show use or modification by people before the establishment of a European presence and can include, but are not limited to, lithic scatters, open camps, lithic procurement areas, and features such as hearths, rock alignments, and rock art. Historic sites show use or modification since the arrival of Europeans and can include, but are not limited to, roads, trails, railroad grades, homesteads, canals, and architecture. Cultural resources that have a direct association with a living culture may be considered ethnographic resources. The reader is referred to Section 3.15.2, Native American Traditional Values, for the discussion of ethnographic resources.

3.15.1.1 Regulatory Framework

Federal historic preservation laws provide a legal framework for documentation, evaluation, and protection of cultural resources that may be affected by Federal undertakings. NEPA states that Federal agencies shall take into consideration impacts to the environment with respect to an array of resources, and that alternatives must be considered. The courts have made clear that cultural resources are regarded as part of the environment and to be considered under NEPA. The NHPA of 1966, as amended, established the Advisory Council on Historic Preservation and the NRHP, and mandates that

Federal agencies consider an undertaking's effects on cultural resources that are listed or eligible for listing on the NRHP. Cultural resources listed on or eligible for inclusion on the NRHP are referred to as historic properties.

Section 106 of the NHPA establishes a four-step review process by which historic properties are given consideration during the conduct of Federal undertakings. The four steps are as follows:

- Initiate the Section 106 process by establishing the undertaking, defining the Area of Potential Effect (APE), and consulting with the appropriate parties, including Federal agencies, SHPOs, Advisory Council on Historic Preservation, Native American tribes, local governments, interested parties, and the public;
- Identify historic properties through inventory and evaluation;
- Determine effects to historic properties using the criteria of adverse effects found in 36 CFR 800.5; and
- If adverse effects occur, take appropriate measures to avoid, minimize, or mitigate those effects.

NRHP Criteria of Eligibility

Cultural resources are assessed for integrity or as having unique qualities that make the resources eligible for the NRHP, which provides for management and protection of these resources. There are three main standards that a cultural resource must meet to qualify for listing on the NRHP: age, integrity, and significance. To meet the age criteria, the resource generally must be at least 50 years old. To meet the integrity criteria, the resources must possess the applicable aspects of integrity, which may include location, design, setting, materials, workmanship, feeling, and association (36 CFR 60.4). Finally, the resource must be significant according to one or more of the following criteria:

- Criterion A – Be associated with events that have made a significant contribution to the broad patterns of history;
- Criterion B – Be associated with the lives of persons significant in history;
- Criterion C – Embody the distinctive characteristics of a type, period, or method of construction, or represent the work of a master, or possess high artistic values, or represent a significant and distinguishable entity whose components may lack individual distinction; or
- Criterion D – Have yielded, or may be likely to yield, information important in prehistory or history (36 CFR 60.4).

3.15.1.2 Cultural Resources Investigations in the Project Vicinity

Cultural resource investigations were performed along existing transmission lines and along routing segments outside of the existing transmission line ROWs, except portions of the underground variants and where rights-of-entry were not obtained. For the purposes of this EIS, the results of the surveys are considered to be representative of sites that occur in the Project vicinity.

In September 2011, a Class I files search was conducted through the Colorado Office of Archaeology and Historic Preservation to identify previously conducted cultural resources inventories and previously recorded cultural resources within 1 mile of the existing transmission lines (Satterwhite 2012). In addition, General Land Office maps, USGS quadrangles, and historic aerial photographs were reviewed to identify potential historic-era resources. The files search and map/aerial photograph review identified a total of 23 previously recorded cultural resources within 300 feet of the existing transmission line ROWs and 20 previously conducted inventories within or intersecting the overall files search study area. With the exception of one site (prehistoric lithic scatter), all of the previously recorded sites are identified as historic-era resources, most of which are transmission lines and canals.

In August and September 2011, a Class III pedestrian inventory was conducted which covered a total of 27.8 miles of the transmission line ROW, 14.25 miles of access roads, and 1.99 miles of areas located outside of the existing transmission lines (Satterwhite 2012). The survey corridor for the transmission line ROW measured 150 feet centered on the transmission line centerline and measured 300 feet centered on the transmission line centerline for the areas located outside of the existing transmission lines. For the existing access roads, the survey corridor measured 50 feet (centered on the road) on private land and 100 feet (centered on the road) on Federal and state lands. The inventory resulted in the documentation of four newly recorded historic sites and the re-evaluation of nine previously recorded historic sites. In addition, five isolated finds were documented. **Table 3.15-1** lists the historic sites documented during the Class III inventory and their NRHP-eligibility status.

Table 3.15-1 Sites Documented During the 2011 Class III Inventory

Site Number	Site Type	NRHP-Eligibility Determination by Western
5LR801	Rowe Cabin	Determined not eligible
5LR2148	Log cabin	Determined not eligible
5LR3992\ 5LR9390	Pole Hill Power Plant and Switchyard	Within existing CBT Project Historic District; contributing element – determined eligible
5LR3994	Pole Hill Afterbay Dam	Within existing CBT Project Historic District; contributing element – determined eligible
5LR3995	Little Hell Creek Diversion Dam	Within existing CBT Project Historic District; contributing element – determined eligible
5LR4003	Pole Hill Canal	Within existing CBT Project Historic District; contributing element – determined eligible
5LR9388	F-PH Transmission Line	Determined not eligible
5LR9453	E-PH Transmission Line	Determined eligible (only steel lattice-pole segments)
5LR9454	E-LS TAP	Determined eligible (only steel lattice-pole segments)
5LR12920	Ranch complex	Determined eligible
5LR12921	Mine adit	Determined not eligible
5LR12922	Log cabin and associated features	Determined eligible
5LR12923	Can scatter	Determined not eligible

Source: Satterwhite 2012.

Western submitted the Class III inventory report and their determination of NRHP eligibility to the Colorado SHPO for review and concurrence. In a letter dated June 21, 2012, the SHPO concurred with Western's determination that sites 5LR12920 and 5LR12922 are eligible for inclusion on the NRHP and that sites 5LR3992, 5LR3994, 5LR3995, and 5LR4003 are contributing elements to the CBT Historic District (Nichols 2012). In addition, the SHPO concurred with Western's determination that sites 5LR2148, 5LR12921, and 5LR12923 are not eligible for the NRHP and that four of the five isolated finds are not eligible. The SHPO did not concur with Western's determination that 5LR801 and one of the isolated finds were not eligible for the NRHP. Additional documentation was required for the site and isolated find. Until the additional work was completed, the SHPO recommended a finding of "needs data" for these two resources. As for the remaining three sites (5LR9388, 5LR9453, 5LR9454), the SHPO requested completion of additional management forms. In May 2013, an additional Class III pedestrian inventory was conducted of proposed reroutes along the E-LS, E-PH, and F-PH 115-kV transmission lines and portions of the existing transmission lines that had not been previously inventoried (Mullen et al. 2013). A total of 4.92 miles of proposed reroutes on private land and 0.24 mile of the existing E-PH transmission line on National Forest System land (for Alternative D) were inventoried. In addition, per

SHPO recommendation, site forms were updated for three inventoried transmission lines (E-PH, E-LS, and F-PH) that initially had been recorded on Architectural Inventory forms in 1998, but were not considered adequate by the SHPO. An addendum to the Class III inventory report was submitted to the Colorado SHPO for review and concurrence July 2013. SHPO concurrence was received in a letter dated February 21, 2014.

Prior the Class III inventory of the reroutes, a literature review was conducted of the data available at the Colorado Office of Archaeology and Historic Preservation to identify previously conducted cultural resources inventories and previously recorded cultural resources within 1 mile of the existing transmission lines. In addition, General Land Office maps were reviewed to identify potential historic-era resources. The files search and map review identified a total of seven previously recorded cultural resources within 300 feet of the existing transmission lines and eight previously conducted inventories within or intersecting the overall files search study area. All of the previously recorded cultural resources are historic-era resources (**Table 3.15-2**). Of the seven sites, only one (Olympus Siphon [5LR4004]) is not intersected by the existing transmission lines.

Table 3.15-2 Sites Identified During the 2013 Class I Literature Review

Site Number	Site Type	NRHP-Eligibility
5LR827	Pinewood School	No NRHP assessment found
5LR3985	Rattlesnake Dame and Pinewood Reservoir	Within existing CBT Project Historic District; contributing element – determined eligible
5LR4000	Bald Mountain Pressure Tunnel	Within existing CBT Project Historic District; contributing element – determined eligible
5LR4004	Olympus Siphon	Within existing CBT Project Historic District; contributing element – determined eligible
5LR9388	F-PH Transmission Line	Determined not eligible
5LR9453	E-PH Transmission Line	Determined eligible (only steel lattice-pole segments)
5LR9454	E-LS	Determined eligible (only steel lattice-pole segments)

Source: Mullen et al. 2013.

During the Class III pedestrian inventory, site 5LR13201 (John Grieg Homestead) was recorded, site 5LR827 (Pinewood School) was re-evaluated, and recorded one historic isolated find (Satterwhite 2012) was recorded. Of the two sites and isolated finds, the John Grieg Homestead was recommended as eligible for the NRHP; the remaining site is recommended as not eligible. Isolated finds by definition are not eligible for the NRHP. The Pinewood School was the only previously recorded site revisited during the inventory. Of the remaining five previously recorded sites, the Rattlesnake Dam and Pinewood Reservoir (5LR3985) and Bald Mountain Pressure Tunnel (5LR4000) were not revisited because the sites previously had been misplotted and are actually located outside of the inventory area; Olympus Siphon (5LR4004) is entirely underground; and, the three transmission lines (5LR9388, 5LR9453, and 5LR9454) were recorded as part of the previous inventory conducted in 2011. The results of the Class III inventory were compiled in an inventory report, which was submitted to the USFS and BOR for review and concurrence. Concurrence was received from the BOR on December 2, 2013 (Ronca 2013), and from the USFS on September 6, 2017 (Williams 2017). The final draft was submitted to the SHPO for review, and SHPO concurrence was received on February 21, 2014 (Nichols 2014). Consultation with the SHPO regarding the eligibility of portions of the existing transmissions lines is ongoing at this time. The result of this consultation may result in SHPO and Western agreeing on a determination that the lines are eligible for nomination to the NRHP. This action would require in turn that the resultant adverse effects lead to development of an agreement outside of Section 106 for resolution of those effects [36

CFR 800.14(b)(1)(ii)]. In the event that SHPO agrees with Western that the line segments are not eligible there would be no adverse effects and the Section 106 process would be completed with SHPO's concurrence in writing.

3.15.2 Native American Traditional Values

Ethnographic resources are associated with the cultural practices, beliefs, and traditional history of a community. Examples of ethnographic resources include places in oral histories or myths, such as particular rock formations, the confluence of two rivers, or a rock cairn; large areas, such as landscapes and viewscapes; sacred sites and places used for religious practices; social or traditional gathering areas, such as dance areas; natural resources, such as plant materials or clay deposits used for arts, crafts, or ceremonies; and places and natural resources traditionally used for non-ceremonial uses, such as trails or camping locations.

If a resource has been identified through ethnographic research as having importance in traditional cultural practices and the continuing cultural identity of a community, it may be considered a traditional cultural property. The term "traditional cultural property" first came into use within the Federal legal framework for historic preservation and cultural resource management in an attempt to categorize historic properties containing traditional cultural significance. "Traditional cultural significance" refers to those beliefs, customs, and practices of a living community of people that have been passed down through the generations, usually orally or through practice. The traditional cultural significance of a historic property derives its significance from the role the property plays in a community's historically rooted beliefs, customs, and practices. Examples of properties possessing such significance include a location associated with the traditional beliefs of a Native American group about its origins, its cultural history, or the nature of the world; or a location where Native American religious practitioners have historically gone, and are known or thought to go today, to perform ceremonial activities in accordance with traditional cultural practice.

3.15.2.1 Regulatory Framework

Specific statutes, regulations, and EOs guide consultation with Native Americans to identify cultural resources important to tribes and to address tribal concerns about potential impacts to these resources. These include the NEPA, NHPA, American Indian Religious Freedom Act of 1978, Native American Graves Protection and Repatriation Act of 1990, and EOs 13007, Indian Sacred Sites, and 13175, Consultation and Coordination with Indian Tribal Governments. These statutes and regulations direct Federal agencies to consult with Native American tribal leaders and others knowledgeable about cultural resources that are important to them and their way of life. Consultation is conducted for Federal actions, such as decisions about the Project, that have the potential to affect locations of traditional concern, areas where religious ceremonies are conducted, areas of traditional cultural uses, archaeological sites, and other modern and ancestral tribal resources.

The DOE's policy on the Management of Cultural Resources (DOE P141.1) and DOE's American Indian and Alaska Native Tribal Government Policy require Western to conduct government-to-government consultation for any action with a potential impact to Native American tribes. Western understands that meaningful consultation and coordination with Native American tribes are not only good practices, but also lead to better government decisions.

The 1992 NHPA amendments place major emphasis on the role of Native American groups in the Section 106 review process. NHPA implementing regulations incorporate specific provisions for Federal agencies to involve Native American groups in land or resource management decisions and for consulting with these groups throughout the process. Before making decisions or approving actions that could result in changes in land use, physical changes to lands or resources, changes in access or alienation of lands, Federal agencies must determine whether Native American interests would be affected, observe pertinent consultation requirements, and document how this was done.

Native American tribes that the Project potentially may impact include the Cheyenne and Arapaho tribes of Oklahoma, Southern Ute Indian Tribe, Northern Arapaho Tribe of the Wind River Reservation, Ute Indian Tribe of the Uintah and Ouray Reservation, Northern Cheyenne Tribe, Eastern Shoshone Tribe, and Oglala Sioux Tribe. On November 17, 2011, Western initiated government-to-government consultation with the seven listed tribes as part of the Estes-Flatiron Transmission Line Project EA process. The letter was sent to inform the tribes of the previously Project and to solicit any concerns they may have regarding the possible presence of any places of traditional religious or cultural importance within or near the Project area. In the letter, Western also informed the tribes of public meetings in Estes Park tentatively scheduled for November 29 and 30, 2011. On April 12, 2013, a second letter was sent to the tribes notifying the intent to begin the EIS process; it included the NOI (DOE 2012 and **Appendix A**). On July 16, 2012, a third letter was sent to the seven tribes as part of the Estes-Flatiron Transmission Line Project EIS process. The letter was sent to invite the tribes to participate in the Project’s EIS scoping meetings held in Loveland and Estes Park, Colorado, on August 6 and 7, 2012, respectively. None of the tribes responded to the letter or attended the public scoping meetings. On September 12, 2012, a fourth letter was sent to the tribes describing the workshops process and inviting them to participate. No response was received to the fourth letter, and no representatives from the tribes attended the workshops. On August 21, 2013, Western sent a fifth letter to the seven tribes informing them of the future release of the Draft EIS. Also included in the letter was information on 1) distribution of the Draft EIS via the Project website and a compact disk; 2) the comment period and how to submit comments; and, 3) public meetings and hearings to be held early in the comment period. As of this date, none of the tribes have responded to any of the letters.

3.15.2.2 Native American Traditional Values Investigations in the Project Vicinity

The affected environment for Native American traditional values is the same as for cultural resources and includes the entire Project vicinity, as well as a sufficient surrounding area to allow discussion of the regional prehistoric and historic context of tribal resources.

As of this date, no places of traditional religious or cultural importance to the seven contacted tribes have been identified in or near the Project vicinity either through the government-to-government consultation efforts or Class III inventories. Opportunities for the identification of locations of possible traditional religious and cultural importance to the tribes that may be affected by the Project will remain open throughout the consultation process, which currently is ongoing and would continue through Project implementation.

3.16 Transportation

Travel routes in the western Project area are numerous and include U.S. Highways 36 and 34, which are major transportation corridors between Rocky Mountain National Park and the Front Range cities of Loveland, Fort Collins, Boulder and Denver. Travel routes in the central part of the Project area are limited, with Pole Hill Road (USFS Road 122) being the only east-west route across the Project area and National Forest System lands. Other USFS roads providing access to structures on National Forest System lands include USFS Road 247.D (Panorama Peak Spur D), USFS Road 247.A (Panorama Peak Spur A), and USFS Road 122.A (Solitude Creek). USFS Road 247.D was rendered inoperable by flooding and has been decommissioned. USFS roads that provide access to Western's ROWs are all presently classified as ML2 and Traffic Service Level “C.” ML2 is assigned to roads open for use by high clearance vehicles where passenger car use is not considered. Traffic Service Level C provides for interrupted traffic flow, limited passing facilities, and low design speeds. In addition, there are approximately 0.6 mile of non-system access spurs that Western uses to access existing structures on National Forest System land.

Mall Road, a Larimer County road, is located in the far western part of the Project area and connects U.S. Highways 34 and 36. In the eastern part of the Project area, several county roads, including County Road 18E (aka Pole Hill Road) and County Road 31 provide access. Local roads in residential areas are either paved or gravel/dirt, and well-maintained. **Table 3.16-1** details the 2011 annual average daily traffic on U.S. Highways 36 and 34 near the western end of the Project area, as well as County Road 18E (Pole Hill Road) near Pinewood and Flatirons Reservoirs.

Permitted uses of smaller roads in the area include access for the maintenance of electrical power lines, substations, pipelines, communication towers and other utilities. Traffic volumes to these facilities are low and access to these facilities is infrequent. Other permitted uses include those associated with National Forest activities.

The primary U.S. and state routes are hard surfaced and well maintained. Larimer County roads are paved or gravel and in good condition. Roads with direct access to the transmission lines are not heavily used. The Pole Hill Road associated with the existing transmission lines and other linear facilities, such as utility ROW managed by Western, provide access. Traveling west from Panorama Point to the Meadowdale Hills subdivision, the Pole Hill Road is predominantly a four-wheel drive road and inaccessible to any other vehicles.

Table 3.16-1 Summary of Current Traffic near the Project Area

Route	2011 Annual Average Daily Traffic	2011 % Trucks
U.S. Highway 36 east of Mall Road, east of Estes Park	5,900	5
U.S. Highway 34 east of Mall Road, east of Estes Park	5,000	2
Mall Road, east of Estes Park	400-2,000	NA
County Road 18 E (Pole Hill Road) near Pinewood Reservoir	400-2,000	NA

Source: Colorado Department of Transportation 2012; Larimer County 2012e.

3.17 Accidents and Intentional Destructive Acts

The Project may be the subject of intentional destructive acts ranging from vandalism and theft to sabotage and acts of terrorism intended to disable a line or Project. The former, more minor type of act is far more likely for such projects in general and particularly for those like the Project, which are in relatively remote areas and serve relatively small populations. Vandalism is more likely to take place in relatively remote areas, and involve acts of opportunity (e.g., shooting out transmission line insulators) than premeditated acts. Intentional sabotage or terrorist acts would not be expected to target these electrical facilities, where a loss of service would not have substantial regional impacts. Accidents, such as a disruption to power from maintenance activities, could occur at any point along the lines.

The results of intentional destructive acts could be wide ranging or more localized, depending on the nature and location of the acts, and would be similar to outages caused by natural phenomena such as storms and ice buildup or accidents. If a transmission line was out of service as a result of a destructive act, residences could lose lighting, heating, or air conditioning. Electrical appliances would be non-functional until electrical service was restored. In such cases, perishable food could spoil; residents would be inconvenienced and could experience discomfort during cold or hot weather. However, some residents may already have backup generators and alternate means of refrigeration, cooking, and heating. Also, if the residences would be supplied with electricity from two or more sources, there may be no noticeable interruption or only minor, temporary interruptions if the alternate sources were not impacted.

Intentional destructive acts and accidents also can result in commercial and industrial electricity users losing lighting and ventilation, but also could include the shutting down of office equipment, computers, cash registers, elevators, heavy machinery, food preparation equipment, and refrigeration. Some commercial operations could be forced to shut down temporarily from a loss of power or concerns about safety. Municipalities could be affected by the shutting down of traffic signals, while city offices could have to close temporarily. Police and fire services could be affected if communication systems shut down. City services, such as sewer and water systems, could be affected by extended outages. Loss of electrical service at hospitals would be of special concern as it could be life threatening. Such effects might be mitigated at hospitals and for other critical uses through the use of temporary backup power (e.g., from a diesel or gas-powered generator).

In addition to the effects from loss of service, destructive acts or accidents could cause environmental effects from damage to the facilities. A possible effect would be fire ignition, should conductors be brought down.

4.0 Environmental Impacts

4.1 Introduction

This chapter describes the anticipated direct and indirect impacts of the alternatives and is organized in parallel with Chapter 3.0. The analysis of potential impacts from the Project alternatives assumes the SCPs and EPMs described in Section 2.5 would be implemented as they are committed to in this document. Where applicable, mitigation measures developed in response to anticipated impacts are presented for individual resources, and are discussed at the end of each resource section; however, all mitigation measures disclosed in the Draft EIS were committed to as EPMs. The analysis of the potentially affected resources is based on the professional judgment and experience of Western, USFS, and EIS contractor resource specialists; discussions with other agency resource experts, professionals, and the public; literature reviews; and field trips to the study area by resource personnel. The level of analysis is commensurate with the expected level of potential impacts.

The goal of this chapter is to disclose, to the greatest extent possible, the expected effects of each alternative on the affected resources. If quantitative estimates are not possible, qualitative estimates are provided to facilitate the comparison of alternatives by the public and decision makers. Following public review of the Draft EIS and subsequent input, Western and the USFS identified an APA. The APA is comprised of sections of alternatives analyzed in detail in the Draft EIS, consisting of Alternative C in the west and primarily the center, and Alternative B in the east. As the alternative segments that comprise the APA were analyzed in detail in the Draft EIS, the Chapter 4.0 Final EIS analysis was not modified to show the APA as a stand-alone alternative. See Sections 2.2 and 2.8, and **Tables 2.9-1** through **2.9-4** for further description of the APA as well as tabular comparative impact analysis, both quantitative and qualitative, of all the alternatives including the APA. Data presented in **Tables 2.9-1** through **2.9-3** have been modified slightly compared to what was presented in the Draft EIS to take advantage of new data availability and revised ROW acquisition needs, as well as to include the APA. Further, Western's SCPs and additional EPMs are portrayed in Sections 2.5.1 and 2.5.2.

4.1.1 Impact Thresholds

4.1.1.1 Impact Type

Impact type classifies an effect as direct, indirect, or cumulative, and then determines whether the effect would result in beneficial or adverse effects.

Direct: Effect caused by the alternative and occurs in the same time and place (e.g., removal of vegetation, pollutant emissions as a result of machinery use, etc.).

Indirect: Effect caused by the alternative is later in time or farther removed in distance, but is still reasonably foreseeable (e.g., increased development in the area, accelerated erosion).

Cumulative: Incremental effect caused by the alternative when added to other past, present, and reasonably foreseeable future actions (e.g., combined effect of Project and other actions). Cumulative effects are addressed in Chapter 5.0.

4.1.1.2 Impact Duration

Describes the length of time an effect would occur as short- or long-term.

Short-term: Lasting no longer than the immediate 1- to 5-year Project implementation period (e.g., construction period, build-out period).

Long-term: Lasting beyond the implementation period (beyond 5 years), typically extending beyond a decade or indefinitely.

4.1.1.3 Impact Intensity

Intensity describes the degree, level, or significance of an effect as no effect, negligible, minor, moderate, or significant.

No effect: No discernible effect.

Negligible: Effect is at the lowest level of detection and causes very little or no disturbance or improvement.

Minor: Effect that is slight but detectable, with some perceptible effects of disturbance or improvement.

Moderate: Effect is readily apparent and has measurable effects of disturbance or improvement.

Significant: Effect is readily apparent and has measurable effects of disturbance or improvement that are of local, regional, or global importance; or sets a precedent for future Project undertakings by Federal agencies. The significance criteria or threshold is determined on an individual resource basis; significance criteria are provided in each resource section.

4.1.2 Mitigation Measures

If the potential for significant impacts from an alternative remained for a resource after consideration of SCPs, mitigation measures were recommended in the Draft EIS. Subsequently, all mitigation measures have been committed as EPMs.

4.1.3 Residual Impacts

After SCPs and EPMs are taken in to consideration, the residual impacts are what remains and is described for each resource. Irreversible and irretrievable commitments of resources are the obligated resources or impacts that cannot be reclaimed. The selection of a transmission line ROW action alternative would likely result in an irreversible commitment of land and management of the ROW for the life of the transmission line. However there are no irretrievable commitments that cannot be reclaimed at some future date if the transmission line were removed and the land and resources reclaimed.

The relationship between the short-term use and long-term productivity also is described in Chapter 4.0.

4.2 Air Quality

The impact analysis area for impacts to air quality includes the area within 3.1 miles (5 kilometers), of the Project boundaries. Visibility impacts to Class I areas are analyzed based on the proximity of Rocky Mountain National Park. No issues of concern were identified by Western through internal scoping, consultation with coordinating agencies, or through comments provided during public scoping. The following discussion is related to potential impacts to air quality associated with:

- Air pollutants emitted from the tailpipes of construction equipment, including criteria pollutants and greenhouse gas emissions;
- Fugitive dust generated during construction and facility maintenance;
- Windblown dust generated due to wind erosion of disturbed surfaces;
- Impairment of visibility conditions in Class 1 areas (Rocky Mountain National Park); and
- Conformity requirements in nonattainment areas.

4.2.1 Methodology

Impacts to air quality include changes in criteria pollutants including fugitive dust emissions, emissions of hazardous air pollutants and greenhouse gas emissions. Generally, minor surface-based particulate emissions have maximum impact levels within 1,640 feet (500 meters) of the source, and do not have noticeable effects (i.e., greater than 1 $\mu g/m^3$) in areas beyond 3.1 miles (5 kilometers). For the estimation of air quality related impacts, the methodology depends on the activity (construction equipment, windblown dust, etc.) and the type of air impacts (criteria emissions, greenhouse gases, etc.). The activity/air impact combinations are grouped together based on the issues identified above. **Table 4.2-1** lists the relevant management considerations for air quality. The calculation methodology and assumptions for analysis for each activity affecting air quality are described below.

Table 4.2-1 Relevant Management Considerations for Air Quality

Resource Topic	Management Considerations
NAAQS	Compliance with NAAQS and state standards
Visibility	Federal guidelines for visibility impairment
Atmospheric Deposition	Federal guidelines for atmospheric deposition
Greenhouse gas	Climate change

NAAQS = National Ambient Air Quality Standards.

4.2.2 Significance Criteria

A significant impact on air quality would result if any of the following were to occur from constructing the Project:

- Predicted concentrations of criteria air pollutants exceed Colorado or Federal Ambient Air Quality Standards (AAQS);
- Predicted concentrations exceed the maximum allowable increments for PM_{10}, $PM_{2.5}$, NO_2, or $SO_{2;}$ or
- Predicted air pollutant emissions that would result in a change in visibility that would exceed Class I standards.

4.2.2.1 Fugitive Dust Emissions from Construction Equipment and Facility Maintenance

Fugitive dust is lofted into the air by construction equipment during many types of activities: driving over unpaved surfaces, excavation, and transfer of excavated material from one place to another. The USEPA has developed a generic emission factor of 1.2 tons per acre per month for fugitive dust that includes all construction activities (USEPA 1995). The emission calculations for fugitive dust associated with ROW construction activities are based on the estimated acres of land actively undergoing construction and emission factors for heavy construction operations from the USEPA (1995). The estimate of area actively constructed on any given day includes the transmission line ROW, temporary construction staging areas, and access roads. However, all of this area would not be undergoing construction simultaneously; for the purposes of Project emission calculations, it is estimated that approximately 5 percent of the disturbed acreage would be under active construction. Fugitive dust emissions during construction would be controlled as specified in the SCPs. For the purposes of emission calculations, the estimated fugitive dust emissions are assumed to be reduced 50 percent by either natural precipitation or the use of appropriate control measures such as watering as specified in SCP 14.

Localized air quality emissions at a given location due to construction activities are expected to be short-term (i.e., less than 1 year), consistent with the Project schedule. No construction or operating permits for stationary sources, such as batch plants or operating permits for larger combustion sources, are expected to be required for the Project. Existing concrete batch plants would already have any necessary operating permits. In the case of portable concrete batch plants, should such facilities be used, it is likely that it would be on a contract basis and as such, air pollutant source permitting would be the responsibility of the plant owner. Based on throughput capacity, the owner may be required to comply with New Source Performance Standards set forth in 40 CFR Part 60, Subpart OOO. Specifically, portable sand and gravel and crushed stone plants are subject to Subpart OOO if maximum design capacities of greater than 150 tons per hour (based on the combined capacity of all initial or primary crushers). In addition, all affected equipment (i.e., equipment that is in-line with the primary or initial crusher) is subject to Subpart OOO. Any local operator of such a portable plant will likely already have the necessary permits for operation of a portable facility.

With respect to open burning of slash piles, Colorado Regulation No. 9 (Open Burning, Prescribed Fire, and Permitting) requires that no person shall conduct any open burning activity not exempted from state regulations without first obtaining a permit from the Division, or from a local agency authorized by the Division to issue burning permits. In Larimer County a General Open Burn Permit must be obtained from the Larimer County Health Department (http://www.larimer.org/burnpermit/). The open burn period 'season' for forest slash piles is from October 1 thru May 1, and is always dependent upon favorable conditions existing (3+ inches of snow on ground, light wind, daylight burning only) before ignition can occur. Pile burning would not occur on USFS lands.

In the event that there would be stationary source subject to Air Pollution Emissions Notice reporting or permitting, these would be obtained prior to construction activities. The proposed construction equipment would be comprised primarily of heavy-duty, non-road mobile equipment powered by diesel fuel. Some pickup trucks would operate on gasoline rather than diesel fuel. Emissions from diesel engines would be minimized because engines must be built to meet the standards for mobile sources established by the USEPA mobile source emissions regulations (40 CFR Part 85). In addition, the USEPA requires that the maximum sulfur content of diesel fuel for highway vehicles be no more than 15 ppm weight.

- For calculating tailpipe emissions from construction equipment, assumptions include:
  - Diesel construction equipment would consume ultra-low sulfur diesel fuel.
  - Pickup trucks are assumed to be equivalent to light-duty, gasoline powered, passenger vehicles.
  - Construction activities would occur for 12 hours per day, 6 days a week.
  - Not all pieces of construction equipment would operate simultaneously. At any given time, roughly a third of the equipment would be operating; thus, it is assumed that each piece of equipment would operate 4 hours out of a 12-hour construction day. This is a conservative approach because a particular piece of equipment, such as a crane, has a very specific function and must remain on-site to perform this function, but this function is not required to occur continuously.
  - Pickup trucks used for transporting crews and other local trips, would make two trips per hour on average over a 12-hour work day (24 trips per day). Each trip is assumed to be 4 miles on average.
- For calculating fugitive dust from construction and maintenance, assumptions include:
  - 75 percent of the construction fugitive dust is in the PM_{10} size range (USEPA 1998), and 10 percent of the PM_{10} is in the $PM_{2.5}$ size range (Countess Environmental 2006);
  - Site grading in preparation for structure construction is the primary general construction activity that would produce fugitive emissions;

- Site grading would be more for undergrounding portions; and
- A control efficiency of 50 percent is assumed for purposes of emission calculations.

ROW facilities would be regularly maintained and a light-duty truck would travel the length of the accessible power line ROW once per month.

A Federal agency must make a determination that permitting or approving an activity conforms to the state implementation plan in accordance with 40 CFR Part 93.150. A conformity determination is required for each pollutant when the total of direct and indirect emissions caused by a Federal action in a non-attainment area would equal or exceed threshold quantities specified in 40 CFR Parts 93.153(b) (1) and (2). The applicable conformity thresholds for the Project area are as follows:

- New Source Review (NSR) – 100 tons per year (tpy) for NO_X, CO, VOCs, sulfur oxides (SO_X), and PM_{10}, respectively.
- PSD – 250 tpy for NO_X, CO, VOCs, SO_X, and PM_{10}.
- Title V – 100 tpy for NO_X, CO, VOCs, SO_X, and PM_{10}.
- Conformity Thresholds – 100 tpy for NO_X, CO, VOCs, SO_X, and PM_{10}.

Because the Project is predicted to emit all of these pollutants (or precursors in the case of ozone), a conformity review was conducted based on DOE guidance (DOE 2000). To conduct the conformity review, the impacts of the Project ROW construction and facility maintenance activities were assessed in the nonattainment areas. Emissions in the nonattainment area were calculated using the methodology described above for tailpipe emission and fugitive dust emissions, except calculations were limited to the nonattainment area. Estimated emissions were compared with the emissions threshold for conformity determinations as published by DOE (2000).

4.2.3 Impacts Common to All Alternatives

Tailpipe emissions would occur from mobile sources including earth-moving equipment such as scrapers, loaders, bulldozers, backhoes, brush hogs, and ATVs during construction of access roads and preparation of structure sites as well as from pickup trucks and semi-tractor trailers used to transport crews and materials. Structure components and transmission line equipment, as well as electrical cable and other equipment and supplies would be delivered by large trucks and semi-tractors. Large cranes or helicopters would be used to install structures. Emissions from these activities include fugitive dust and tailpipe emission (CO, NO_X, VOCs, particulates, SO_2, and air toxics). Emissions for these criteria pollutants would have a minor adverse effect on local air quality in the vicinity of each structure during construction. Impacts to air quality would be direct but short-term during construction and operation of the Project. No indirect impacts are expected.

<u>Criteria Pollutant Air Emissions</u>

Construction emissions would occur during construction of access roads, preparation of transmission structure sites, and construction of the transmission line. Fugitive dust results from the use of earth-moving equipment, including loaders, scrapers, bulldozers, shovels, and backhoes. **Table 4.2-2** shows the direct emissions by Project component for each alternative and variant.

Shorter steel structures in visually sensitive areas would increase the emissions shown in structures row of **Table 4.2-2** since the shorter spans would require about twice as many structures to complete these segments of the transmission line.

Table 4.2-2 Fugitive Dust (Particulate) Emissions by Project Component and Alternative

Project Component Construction	PM_{10} (tpy)						$PM_{2.5}$ (tpy)					
	Alt A & Var A1	Var A2	Alt B	Alt C	Var C1	Alt D	Alt A & Var A1	Var A2	Alt B	Alt C	Var C1	Alt D
Structures	28.1	23.6	31.1	29.0	24.3	60.4	14.0	11.8	15.5	14.5	12.1	30.2
Trenches	NA	9.7	NA	NA	10.0	NA	NA	4.9	NA	NA	5.0	NA
Stringing Sites	2.4	2.4	2.4	2.4	2.4	2.4	1.2	1.2	1.2	1.2	1.2	1.2
Staging areas	18.0	18.0	18.0	18.0	18.0	18.0	9.0	9.0	9.0	9.0	9.0	9.0
Access Routes	16.2	16.2	13.0	17.8	17.8	14.9	8.1	8.1	6.5	8.9	8.9	7.4
H-frame removal	57.8	57.8	57.8	57.8	57.8	57.8	28.9	28.9	28.9	28.9	28.9	28.9
Total	122.5	127.8	122.3	125.0	130.2	153.5	61.3	63.9	61.1	62.5	65.1	76.8

Alt = Alternative, Var = Variant, PM_{10} = particulate matter 10 microns or less, $PM_{2.5}$ = particulate matter 2.5 microns or less.

In addition to fugitive dust, mobile construction equipment also would have tailpipe emissions of limited quantities of other criteria pollutants including CO, NO_2, SO_2, VOC, and PM_{10}. **Table 4.2-3** lists these emissions and greenhouse gas (GHG) (as carbon dioxide equivalent [CO_2e]) on an annual basis.

Table 4.2-3 Annual Tailpipe Emissions from Construction

	Pollutant (tpy)					
	CO	**NO_x**	**SO_2**	**VOC**	**PM_{10}**	**CO_2e**
Total	14.0	65.1	4.3	5.2	4.6	2413.6

<u>Dispersion Modeling Results to Assess Impacts to Air Quality</u>

Screening-level dispersion modeling was performed to assess PM_{10} and $PM_{2.5}$ impacts of fugitive dust from disturbed acres during construction. Air impacts modeling was performed using the USEPA-approved SCREEN3 model. SCREEN3 is a single source Gaussian plume model which provides maximum ground-level concentrations for point, area, flare, and volume sources. SCREEN3 is a screening version of the ISC3 model. For this study, SCREEN3 model version 96043 was used to evaluate impacts from fugitive dust. The construction area was modeled as an area source using full meteorology as well as regulatory model default values for mixing heights and anemometer heights. Impacts were assessed at a distance of 50 meters from the disturbance that is representative of all such activities in the direct impacts assessment area. Results of the conservative screening level dispersion modeling analysis which are applicable for all alternatives are shown in **Table 4.2-4** and indicate that the adverse impacts due to fugitive dust emissions from disturbed acres are well within the National and State AAQS. Background levels shown are representative of the rural background levels for the pollutants throughout the region including the locations all alternatives.

Table 4.2-4 SCREEN3 Model Results for Construction Fugitive Dust

Pollutant	Averaging Time	Impact ($\mu g/m^3$)	Background ($\mu g/m^3$)	Total Impact ($\mu g/m^3$)	NAAQS ($\mu g/m^3$)	% of NAAQS
PM_{10}	24-hour	115.8	10.2	125.7	150	84
	Annual	28.9	9	37.9	50	76
$PM_{2.5}$	24-hour	11.6	6.9	18.5	35	53
	Annual	2.9	2.6	5.5	12	46

$\mu g/m^3$ = microgram per cubic meter, NAAQS = National Ambient Air Quality Standards.

Screening-level dispersion modeling using SCREEN3 also was performed to assess impacts of criteria pollutants from heavy and light duty truck emissions. The trucks were modeled as volume sources using full meteorology as well as regulatory model default values for mixing heights and anemometer heights. Gaseous pollutant emissions from light and heavy duty vehicles are much less than particulate emissions when vehicles are traveling on unpaved roads. Background concentrations of gaseous pollutants in rural settings are typically not available, since monitoring generally takes place where there are larger or more abundant sources of these pollutants. Impacts were assessed at a distance of 33 feet (10 meters) from the road for a generic road segment that is representative of all unpaved roads throughout the Project area. Results of the conservative screening level dispersion modeling analysis for heavy duty vehicles are shown in **Table 4.2-5** and indicate that the adverse impacts from unpaved road traffic are well within the National and State AAQS. Impacts due to light duty vehicles (pickup trucks) on unpaved roads are much less than impacts for the larger trucks.

Table 4.2-5 SCREEN3 Model Results for Heavy Duty Vehicles on Unpaved Roads

Pollutant	Averaging Time	Impact (µg/m³)	Background (µg/m³)	Total Impact (µg/m³)	NAAQS (µg/m³)	% of NAAQS
NO_2	1-hour	12.1	NA	12.1	188	6.40
	Annual	0.5	NA	0.5	100	0.5
CO	1-hour	3.5	NA	3.5	40,000	<0.1
	8-hour	2.5	NA	2.5	10,000	<0.1
SO_2	1-hour	1.1	NA	1.1	196	0.6
	3-hour	1.1	NA	1.1	700	0.2
	24-hour	0.5	NA	0.5	365	0.1
	Annual	<0.1	NA	<0.1	80	<0.1
PM_{10}	24-hour	39.9	10.2	50.1	150	33.4
	Annual	4.0	9	13.0	50	25.9
$PM_{2.5}$	24-hour	4.0	6.9	10.9	35	31.2
	Annual	0.4	2.6	3.0	12	19.9

µg/m³ = microgram per cubic meter, NAAQS = National Ambient Air Quality Standards.

The Project would have emissions below the permit levels and would be exempt from the requirement to obtain a Federal or state air quality permit.

Greenhouse Gas Emissions Related to Climate Change

Construction of the Project would result in gaseous emissions, including GHGs from fuel combustion in construction vehicles. Annual construction engine emissions of GHGs (CO_2e, which include CO_2, methane, and nitrous oxide [N_2O]) from construction engine sources are shown in **Table 4.2-3**. The total GHG emissions from construction would be negligible in terms of impacts to climate change. In the final regulation on greenhouse gas permitting, the USEPA considers a source that emits more than 100,000 tpy of CO_2e to be a major source and requires a stationary source that emits more than 25,000 tpy to report their emissions. The estimated annual GHG emissions for this Project are under 2,500 tpy; therefore, the GHG emissions are negligible.

There would be maintenance activities during operations along the transmission line ROW resulting from fuel usage in mostly light duty vehicles and Western's helicopter.

Hazardous Air Pollutants

Of the regulated hazardous air pollutants listed in Section 112 of the CAA, the primary hazardous air pollutants emitted from planned construction activities for this project are benzene, toluene, propionaldehyde, xylenes, acetaldehyde, formaldehyde, napthalene, manganese, and nickel. Emissions of the remaining hazardous air pollutants are orders of magnitude smaller. **Table 4.2-6** provides an estimate of emissions of hazardous air pollutants in pounds per year.

Hazardous air pollutants are regulated by emissions, and they do not approach the level of concern which is 10 tpy for individual hazardous air pollutants or 25 tpy in aggregate. Altogether, the primary hazardous air pollutants shown in **Table 4.2-6** are expected to emit less than one tpy and are well below levels of concern. The primary sources of hazardous air pollutants are internal combustion engines used to power construction equipment and vehicles and emissions are very minor; therefore, adverse impacts associated with the Project are anticipated to be negligible.

Table 4.2-6 Principal Hazardous Air Pollutant Emissions (pounds per year)

Pollutant	Pounds per Year
Benzene	212
Toluene	156
Propionaldehyde	123
Xylenes	110
Acetaldehyde	554
Formaldehyde	123
Naphthalene	4
Manganese	6
Nickel	9

Impacts at Class I and II Areas – Acid Deposition

The Project would emit low levels of NO_X and SO_2, which are the potential acid producing pollutants emitted from mobile sources during construction and operation. Impacts are anticipated to be negligible.

Impacts at Class I and II Areas – Visibility

Construction of the Project would emit low levels of pollutants, principally PM_{10} and $PM_{2.5}$, as well as tailpipe emissions from mobile sources. Federal land managers have visibility protection responsibility under 40 CFR §51.307 (New Source Review), which spells out the requirements for State Implementation Plan visibility protection programs, as well as 40 CFR §52.27 (Protection of visibility from sources in attainment areas) and 40 CFR §52.28 (Protection of visibility from sources in non-attainment areas). These three provisions, taken together along with the State Implementation Plan-approved rules, establish the visibility protection program for new and modified sources throughout the country.

Section 165 (42 U.S.C. 7475) of the CAA requires the USEPA, or the state/local permitting authority, to notify the Federal land manager if emissions from a Project may impact a Class I area. Although the entire Project lies within 30 miles (50 kilometers) of Rocky Mountain National Park, the proposed alternatives do not constitute a major stationary source and do not require notification to the Federal land manager. The limited duration and low levels of emissions from the Project construction and operation would have no discernible effect on visibility in Rocky Mountain National Park.

Impacts on Ambient Ozone Levels

The proposed alternatives are unlikely to cause or contribute to the formation of regional ozone at detectable levels due to the low level of emissions of potential ozone forming compounds, including NO_X and VOCs. Therefore, the Project is anticipated to have no discernible effect on ambient O_3 levels.

Operation Impacts

Routine line maintenance and repairs during operation of the transmission line would result in negligible air emissions.

General Conformity Analysis for Larimer County

The line would be located in Larimer County, Colorado. Portions of Larimer County are designated non-attainment or maintenance for one or more federally regulated pollutants.

A Federal agency must make a determination that permitting or approving an activity will conform to the state implementation plan in accordance with 40 CFR Part 93.150. A conformity determination is required for each pollutant when the total of direct and indirect emissions caused by a Federal action in a non-attainment area would equal or exceed threshold quantities specified in 40 CFR Parts 93.153(b) (1) and (2). The applicable conformity thresholds for the Project area are as follows:

- NSR – 100 tpy for NO_X, CO, VOCs, SO_X, and PM_{10}, respectively.
- PSD – 250 tpy for NO_X, CO, VOCs, SO_X, and PM_{10}.
- Title V – 100 tpy for NO_X, CO, VOCs, SO_X, and PM_{10}.
- Conformity Thresholds – 100 tpy for NO_X, CO, VOC, SO_X, and PM_{10}.

Since the Project is predicted to emit all of these emissions (or precursors in the case of ozone), a conformity review was conducted based on DOE guidance (DOE 2000). To conduct the conformity review, the impact of the construction and maintenance activities was assessed in the nonattainment areas. Emissions in the nonattainment area were calculated using the methodology described above for tailpipe emission and fugitive dust emissions, except calculations were limited to the nonattainment area. Estimated emissions were compared with the emissions threshold for conformity determinations as published by DOE (2000).

Based upon the use of conservative emissions estimates, the emissions from the construction and operation of the transmission lines rebuild in the nonattainment area as shown in **Table 4.2-2** would be below the conformity thresholds; therefore, the Project is exempt from performing a comprehensive conformity analysis.

Short-term effects would include an increase in particulate and gaseous emissions during construction primarily due to fugitive dust released from travel on dirt roads and excavations for structure bases. The long-term effects would result from operations which would require periodic inspection of the transmission line and occasional maintenance. Short-term adverse effects would be minor, and long-term effects would be negligible.

The following conclusions are derived from the analysis presented for various air quality factors. At the present time, there is no known phase or activity proposed to be conducted during the Project that is not consistent with current air quality regulations in Colorado.

Neither the construction nor operations phase of the proposed alternatives is expected to:

- Cause or contribute to any violation of any state or Federal AAQS;
- Interfere with the maintenance or attainment of any state or Federal AAQS in the Project area;
- Increase the frequency or severity of any existing violations of any state or Federal AAQS in the Project area;
- Delay the timely attainment of any standard, interim emission reduction, or other air quality milestone promulgated by the USEPA or state air quality agency;
- Cause any adverse impact to air quality-related values in a Federal Class I area;
- Exceed state or Federal general conformity thresholds;
- Increase GHG emissions to notable levels; and
- Cause or contribute to an exceedance of a NAAQS in the non-attainment area.

4.2.4 No Action Alternative

The No Action Alternative, including the small segment involving the re-location of the line at the Newell Lake View subdivision, would pose impacts similar or incrementally increased compared to the action alternatives. Additional maintenance would be required for operations that would potentially increase fugitive dust from various vehicles required during replacement of old poles and insulators. Impacts associated with maintenance and replacement of the existing lines would be incremental and minor, occurring over a period lasting several years.

Short-term adverse effects include continued dissemination of particulate and gaseous emissions during operations primarily due to fugitive dust released from travel on dirt roads. The long-term adverse effects would result from operations and additional maintenance which would require periodic inspection of the transmission line. Short-term adverse effects would be negligible and long-term adverse effects would be minor.

4.2.5 Impacts Unique to Specific Action Alternatives

There are no impacts that would be unique to the action alternatives A, A1, A2, B, C, or C1. Impacts would be similar between the action alternatives with only slight differences based on the varying segment lengths, area of disturbance, number of towers, or the potential undergrounding of a portion of the transmission line. Reduced need for long-term maintenance activities as a result of abandoned ROWs could result in a reduction in air emissions. Emissions would increase during construction activities on Alternative D.

4.2.6 Mitigation

Because impacts to air quality would not be significant for any alternative, no additional mitigation measures are required beyond the proposed SCPs to further mitigate adverse air.

4.2.7 Residual Impacts

No mitigation has been identified; there would be no significant impacts to air quality from any of the alternatives.

4.2.8 Irreversible and Irretrievable Commitment of Resources

Air quality impacts due to the Project would be reversible. Once construction activities are completed, the air quality would return to pre-Project state. Since impacts are not anticipated to exceed the NAAQS for the Project, irretrievable impacts to air quality would not be anticipated (no discernible effect).

4.2.9 Relationship between Short-term Uses and Long-term Productivity

Project activities that would produce emissions of PM and criteria air pollutants would cease after construction of the Project and would not result in continued, long-term impacts to air quality. GHG emissions would likewise cease following Project activities but the GHGs would remain in the atmosphere over the long-term. Impacts would be anticipated to be negligible.

4.3 Geology and Paleontology

The impact analysis area for geological, mineral, and paleontological resources consists of an area bounded by a 1-mile buffer around the proposed alternatives.

No major issues of concern were identified by Western through internal scoping, consultation with coordinating agencies, or through comments provided during public scoping. The following discussion is related to potential impacts to unique geological features, scientifically important paleontological resources, and access to mineral resources, as well as potential impacts to Project components from geological hazards.

4.3.1 Methodology

Various sources of information were reviewed including published maps, reports, and accessible online databases provided by USGS, Colorado Geological Survey, and other sources such as scientific journals and publications. The information was used to determine if the Project poses a risk of impact to the resources identified in Section 4.3.2. In the case of geological hazards, information was reviewed to determine whether potential hazards are present and to determine what level of risks they would present to the Project.

4.3.2 Significance Criteria

A significant impact to geology, minerals, and paleontological resources would result if any of the following were to occur from constructing and operating the Project:

- Areas of geological importance are lost or made inaccessible for future use.
- Known mineral resources of economic value to the region or residents of the state are lost or made inaccessible for future use.
- Increases in the probability of magnitude of mass geological movement (e.g., slope failures, slumps, rockfalls) occur.
- Scientifically important paleontological resources are lost or made inaccessible for future use.

4.3.3 Impacts Common to All Alternatives

4.3.3.1 Geology and Geological Hazards

Direct impacts to unique geological features would occur if such features were damaged or access to such feature was precluded by the Project. However, no unique geologic features are located within the analysis area; therefore, the Project is anticipated to have no effect on such features.

Direct impacts from geological hazards would occur if those hazards resulted in damage to facilities causing loss of electrical service or presenting a health and safety hazard to people. While seismic hazards are not a concern, landslides and slope instability may present potential hazards to the construction and operation of the Project. Direct impacts of geological hazards during construction would be the potential for grading and excavation to exacerbate or accelerate slope instability. Impacts may be increased during periods of high precipitation or high soil moisture. Indirect effects during construction may include changes in slope or grade that may increase runoff or erosion that increases the risk of slope instability and landslides. Direct adverse impacts from slope instability or landslides would be considered minor to moderate. Implementation of SCPs 26, 28, 29, and 31 (**Table 2.5-1**) would reduce or eliminate ground instability impacts.

Potential adverse impacts from slope instability and landslides could either be short-term or long-term. Short-term effects could be incurred during construction, but would be anticipated to be minor. Long-term effects may occur during the operational life of the Project.

4.3.3.2 Mineral Resources

It is not likely that there are potentially commercially extractable mineral resources within the study area so no impacts from construction of the alternatives would be anticipated. Because there are no known mineral resources in the vicinity, there would be no effect on access to mineral resources.

4.3.3.3 Paleontological Resources

Direct impacts would include the destruction or loss of scientifically important fossil resources as a result of construction activities. Indirect impacts during construction and operation would involve damage or loss of fossil resources due to the unauthorized collection of scientifically important fossils by construction workers or the public due to increased access to fossil localities near construction areas.

Any harm to paleontological resources from construction activities or unauthorized collection is balanced by the fact that many important fossil discoveries have occurred because of construction activities. These fossils were only discovered and made available to the scientific community because of construction activities. Because there is a low potential for this adverse impact to occur and SCP 47 would be implemented to minimize impacts if scientifically important fossils are found, this potential is considered to be negligible.

As discussed in Section 3.3, there is low potential for the presence of scientifically important fossils within the study area, so it is unlikely that paleontological resources would be adversely affected by transmission line construction. Therefore, impacts to scientifically significant paleontological resources are expected to be negligible from constructing or operating a transmission line in the proposed ROW. Any harm to paleontological resources from construction activities or unauthorized collection is balanced by the fact that many important fossil discoveries have occurred because of construction activities exposing them to the surface.

4.3.4 No Action Alternative

The No Action Alternative, including the small segment involving the re-location of the line at the Newell Lake View subdivision, would pose impacts similar in type to the other alternatives, except potential impacts would occur over a longer span of time and would entail higher permanent acreage committed to access roads.

4.3.5 Impacts Unique to Specific Action Alternatives

There are no impacts that would be unique to any of the action alternatives. Impacts would be similar between alternatives with slight differences based on the varying segment lengths, area of disturbance, number of towers or the undergrounding of the transmission line. Underground alternatives (Variants A2 and C1) would result in a higher probability of disturbance to paleontological resources; however, as discussed in Section 3.3, there is low potential for the presence of scientifically important fossils within the study area, additionally with the implementation of SCP 47 it is unlikely that paleontological resources would be adversely affected by construction.

4.3.6 Mitigation

Because impacts to geological resources would not be significant for any alternative, no additional mitigation measures to avoid, minimize, or mitigate impacts would be required.

4.3.7 Residual Impacts

No mitigation has been identified; there would be no significant impacts to geological, mineral, or paleontological resources from any of the alternatives.

4.3.8 Irreversible and Irretrievable Commitment of Resources

Because the potential to impact geological resources is low, no irreversible and irretrievable commitment of resources is anticipated.

4.3.9 Relationship between Short-term Uses and Long-term Productivity

Short-term impacts associated with Project construction would have negligible effect on paleontological resources in the area, and would have no effect on the long-term availability or use of geological resources in the area.

4.4 Soil Resources

This assessment focuses on impacts to soils. The discussion includes an overview of issues that may affect soil resources, methods used to analyze impacts, the related significance criteria and descriptions of proposed and additional mitigation measures that would reduce the occurrence and significance of impacts. The analysis area for soil resources includes a width of 200 feet for the existing transmission lines centered on the ROWs for each alternative, 300 feet for new routing options, and 75 feet for the underground variants.

No issues were identified during the EIS scoping process for soil resources.

4.4.1 Methodology

Impacts to soil resources from the Project are based on the locations of the resources in relation to the proposed surface disturbance areas. The exact structure sites for the proposed transmission line and locations of associated access roads and temporary work areas will not be known until after design and engineering is complete. The impacts to soil resources in the Project area were estimated by multiplying the percentage of the Project area impacted from new surface disturbance-related activities by the acreage of each soil type within the proposed ROW for each alternative. Western has the flexibility to site structures to avoid soils with severe limitations if they are not widespread within a specific area. Therefore, this impact assessment method is conservative and likely to overestimate the acreage of soils where small areas with severe limitations can be avoided.

The disturbance area was calculated based on using double-circuit steel structures for Alternatives A, B, and C, including their variants with an average span between structures of 850 feet for the proposed 115-kV line. The area disturbed for Alternative D was based on using a wood H-frame structure design that would involve replacing structures at their current locations. Construction disturbance also includes two to three staging areas, six to eight conductor stringing sites, and the removal of 221 existing H-frame structures. Disturbance acreages are provided in **Table 2.3-5**.

The analysis of the impacts to soil resources is based on the assumption that Western's SCPs and EPMs (Section 2.5) would be implemented as part of the Project. These proposed measures address the compensation for damage to ditches, terraces, and other land features; erosion control and related best management practices; correction of rutting and compaction; access road construction standards, recontouring; and other practices that would minimize soil resources impacts when implemented. To minimize construction-related impacts to soil resources, reclamation would be conducted as soon as practical following surface disturbance. Additionally, Western would comply with the standards and guidelines outlined in the USFS Region 2 Forest Plan on National Forest System land.

Temporary impacts to soils are those that are anticipated to be short-term in nature and following construction would be reclaimed and revegetated. Long-term impacts to soils would include areas where structures, surface facilities, or long-term access roads would be located for the duration of the Project.

4.4.2 Significance Criteria

A significant impact on soils would result if any of the following were to occur from construction or operation of the Project:

- Accelerated erosion due to disturbance results in the formation of rills or gullies, or that result in sediment deposition in downgradient lands or waterbodies to the extent that the existing uses cannot be maintained.
- Soil productivity reduced to a level that prevents the disturbed area from recovering to pre-disturbance soil/vegetation productivity levels.
- Increases in the potential for soil creep, slumping, or mass failure.

4.4.3 Impacts Common to All Alternatives

Impact assessments were based on how soils with a wide range of physical and chemical soil characteristics would be affected by Project activities. The primary impacts that would occur during construction activities would apply to all action alternatives.

In general, most impacts associated with construction of the transmission line would be adverse, temporary, and locally minor to moderate in intensity. Temporary disturbances would occur within the ROW from construction traffic along the ROW or along new or established access ways, material storage yards, batch plant sites, temporary staging areas, and work areas around each structure.

Direct adverse impacts to soil resources would result from the clearing or crushing of surface cover within the ROW (vegetation, duff, litter) and blading/grading of soils during construction. Surface disturbance using equipment to remove vegetation may reduce soil productivity and alter soil development in the short term.

Grading and leveling would be required to construct structures and for temporary work areas and staging areas, with the greatest level of effort required on more steeply sloping areas. During construction, the soil profiles would be mixed with a corresponding loss of soil structure.

Table 4.4-1 shows that generally only about 8 to 20 percent of the alternative 110-foot wide ROWs are occupied by soils susceptible to compaction from construction activities. In these limited areas, soil compaction and rutting could result from the movement of heavy construction vehicles along the construction ROW and on temporary access roads. The degree of compaction would depend on the moisture content and texture of the soil at the time of construction. Compaction would be most severe where heavy equipment operates on moist to wet soils with high clay contents. Soil compaction and a reduction in ground cover would lead to an increase in bulk density, increased runoff, and water erosion. Construction on wet or moist susceptible soils would increase the potential for compaction. Compaction impacts to soils would be minimized through implementation of SCP 1 and the EPMs.

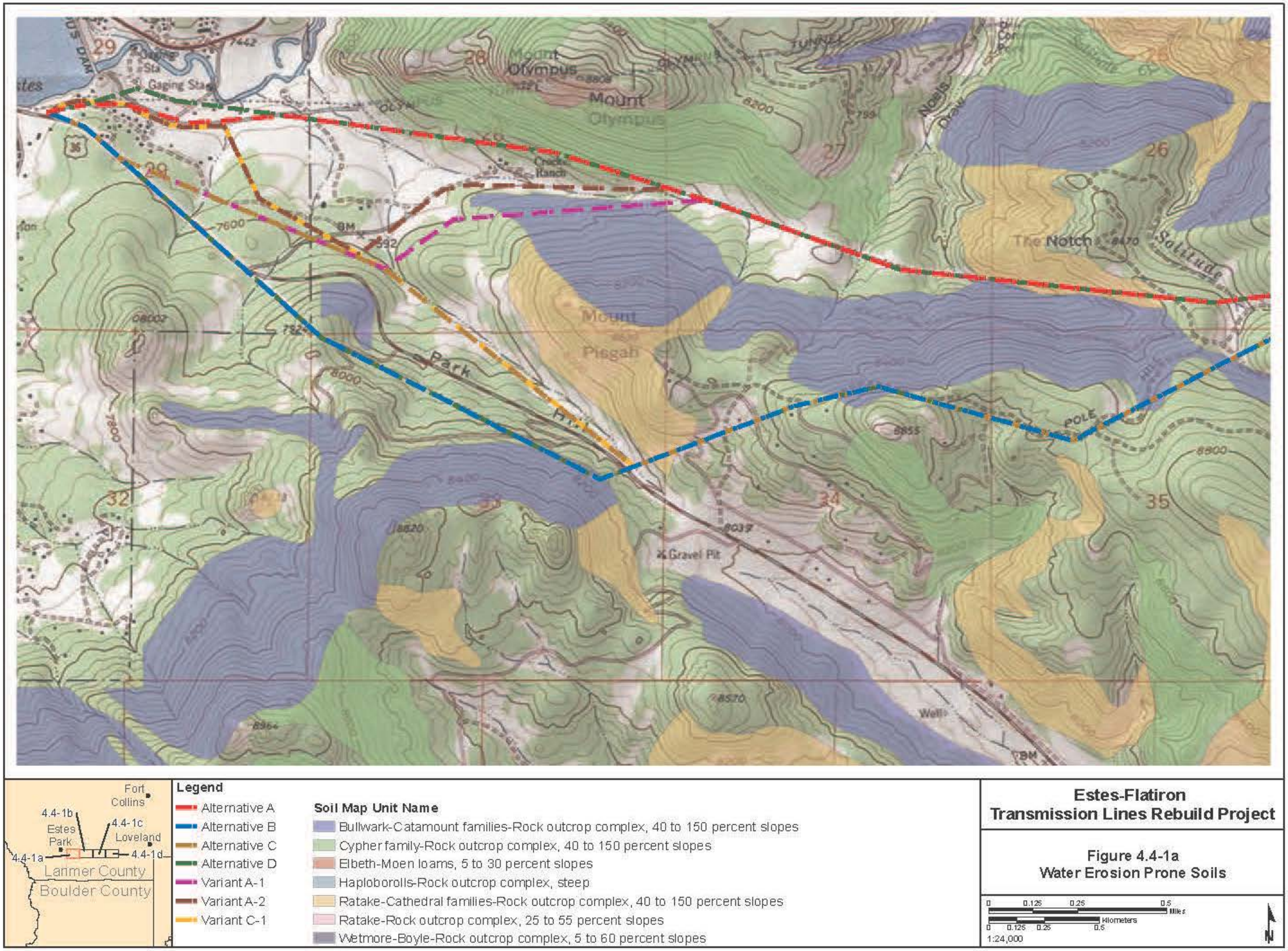
Rutting or soil mixing could occur when soils are saturated. Rutting affects the surface hydrology of a site as well as the rooting environment. The process of rutting reduces the aeration and infiltration of the soil, thereby degrading the rooting environment. Rutting may result in soil mixing of topsoil and subsoil, thereby reducing soil productivity. Rutting also disrupts natural surface water hydrology by damming surface water flows or by diverting and concentrating water flows creating accelerated erosion. Rutting would be minimized by implementation of SCP 2. Soil mixing typically results in a decrease in soil fertility and a disruption of soil structure.

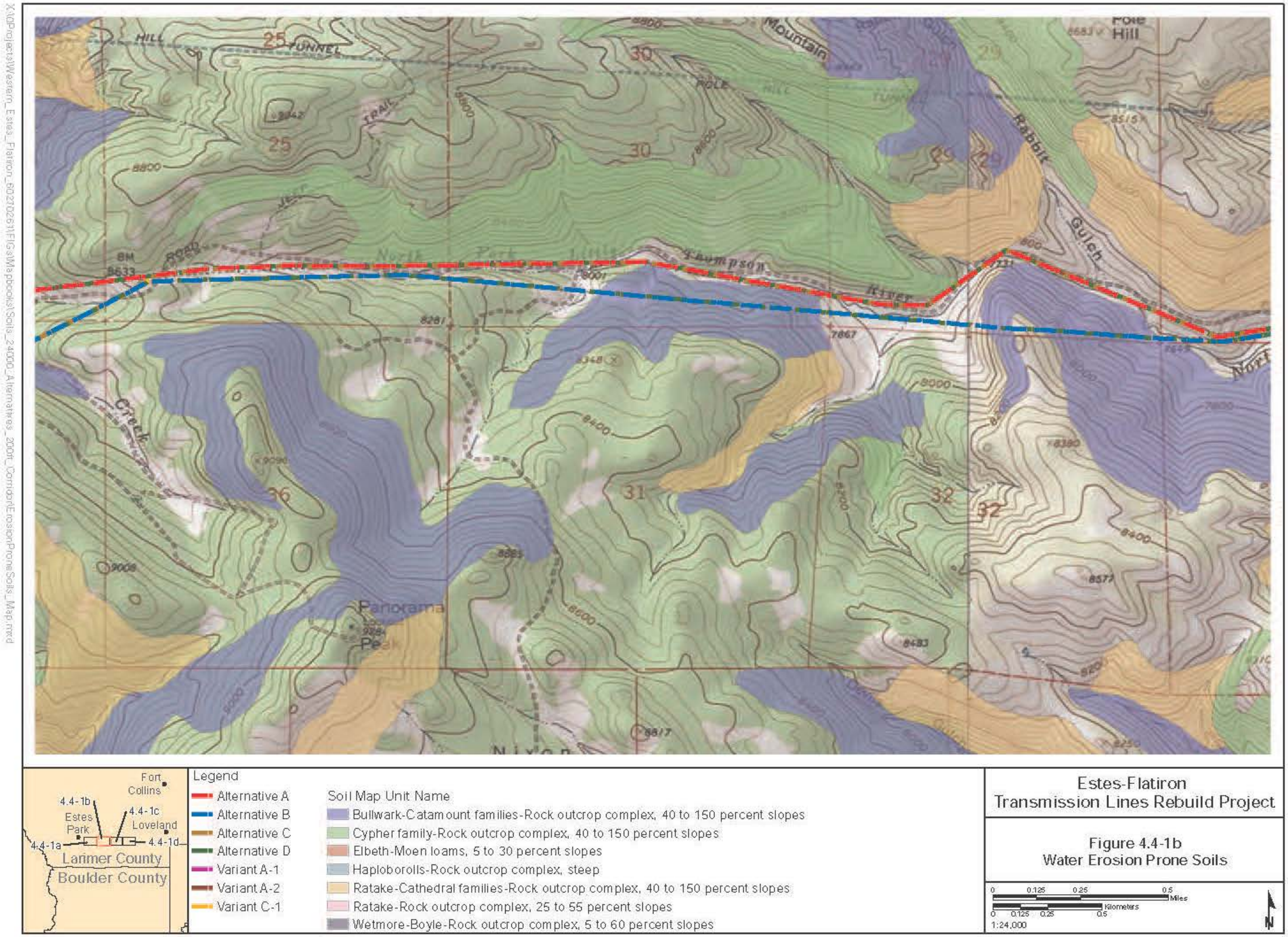
The potential for accelerated erosion would increase through the loss of vegetation cover and increases in bulk density as compared to an undisturbed state. Although accelerated erosion due to construction-related soil disturbance could occur at any stage of construction, the maximum potential for erosion at structure sites would be expected when soils are disturbed or loose, in spoil piles, or where there is a lack of soil cover protecting the surface of the soil. Reclamation and erosion control would be difficult on soils that occur on steeper sloping areas (15 percent or more), particularly those steeper sloping areas with shallow soils (20 inches or less to bedrock). Additionally, soils with lithic bedrock within 60 inches of the soil surface may require blasting.

Water erosion prone soils crossed by the various alternatives are shown in **Figures 4.4-1a** through **4.4-1d**. Soils with bedrock within 60 inches of the soil surface are illustrated in **Figures 4.4-2a** through **4.4-2d**. Steep slopes crossed by the Project alternatives are shown in **Figures 4.4-3a** through **4.4-3d**. Erosion and sedimentation would be minimized through the implementation of SCP 3, SCP 6, SCP 7, SCP 26, SCP 29, SCP 49, and the proposed EPMs.

Table 4.4-1 Soil Characteristics within the Analysis Area for each Alternative and Variant

	Total Acres	Water Erodible	Low Revegetation Potential	Compaction Prone	Shallow Bedrock	Corrosion to Steel	Droughty
Analysis Area: acres and percent (%)							
Alternative A	411	82 (20)	32 (8)	58 (14)	135 (33)	28 (7)	7 (2)
Variant A1	386	76 (20)	32 (8)	57 (15)	125 (32)	26 (7)	7 (2)
Variant A2	348	63 (18)	13 (4)	56 (16)	99 (28)	26 (8)	3 (<1)
Alternative B	346	57 (17)	44 (13)	26 (8)	137 (40)	27 (8)	12 (4)
Alternative C	389	52 (15)	21 (5)	71 (18)	133 (34)	28 (7)	3 (<1)
Variant C1	351	50 (14)	14 (4)	70 (20)	114 (33)	27 (8)	3 (<1)
Alternative D	639	115 (18)	60 (9)	90 (14)	225 (35)	55 (9)	15 (2)
110-foot ROW: acres and percent (%)							
Alternative A	200	40 (20)	16 (8)	28 (14)	66 (33)	14 (7)	4 (2)
Variant A1	201	40 (20)	17 (9)	29 (14)	65 (32)	14 (7)	4 (2)
Variant A2	203	37 (18)	8 (4)	33 (16)	58 (29)	15 (7)	2 (1)
Alternative B	221	36 (16)	28 (13)	17 (8)	88 (40)	17 (8)	8 (4)
Alternative C	207	27 (13)	11 (5)	38 (18)	70 (34)	15 (7)	2 (1)
Variant C1	208	30 (14)	8 (4)	41 (20)	68 (33)	16 (8)	2 (1)
Alternative D	381	69 (18)	36 (9)	53 (14)	134 (35)	33 (9)	9 (2)


Fort Collins
4.4-1b
Estes Park
4.4-1c
Loveland
4.4-1a
4.4-1d
Larimer County
Boulder County
Legend
Alternative A
Alternative B
Alternative C
Alternative D
Variant A-1
Variant A-2
Variant C-1
Soil Map Unit Name
Bullwark-Catamount families-Rock outcrop complex, 40 to 150 percent slopes
Cypher family-Rock outcrop complex, 40 to 150 percent slopes
Elbeth-Moen loams, 5 to 30 percent slopes
Haploborolls-Rock outcrop complex, steep
Ratake-Cathedral families-Rock outcrop complex, 40 to 150 percent slopes
Ratake-Rock outcrop complex, 25 to 55 percent slopes
Wetmore-Boyle-Rock outcrop complex, 5 to 60 percent slopes
Estes-Flatiron
Transmission Lines Rebuild Project
Figure 4.4-1a
Water Erosion Prone Soils
Miles
Kilometers
1:24,000
Mount Olympus
Mount Pisgah
The Notch
Gravel Pit



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Fort Collins
4.4-1b
4.4-1c
Estes Park
Loveland
4.4-1a
4.4-1d
Larimer County
Boulder County
Legend
Alternative A
Alternative B
Alternative C
Alternative D
Variant A-1
Variant A-2
Variant C-1
Soil Map Unit Name
Bullwark-Catamount families-Rock outcrop complex, 40 to 150 percent slopes
Cypher family-Rock outcrop complex, 40 to 150 percent slopes
Elbeth-Moen loams, 5 to 30 percent slopes
Haploborolls-Rock outcrop complex, steep
Ratake-Cathedral families-Rock outcrop complex, 40 to 150 percent slopes
Ratake-Rock outcrop complex, 25 to 55 percent slopes
Wetmore-Boyle-Rock outcrop complex, 5 to 60 percent slopes
Estes-Flatiron
Transmission Lines Rebuild Project
Figure 4.4-1b
Water Erosion Prone Soils
0 0.125 0.25 0.5 Miles
0 0.125 0.25 0.5 Kilometers
1:24,000
N
Pole Hill
Panorama Peak
Rabbit Gulch
Thompson River

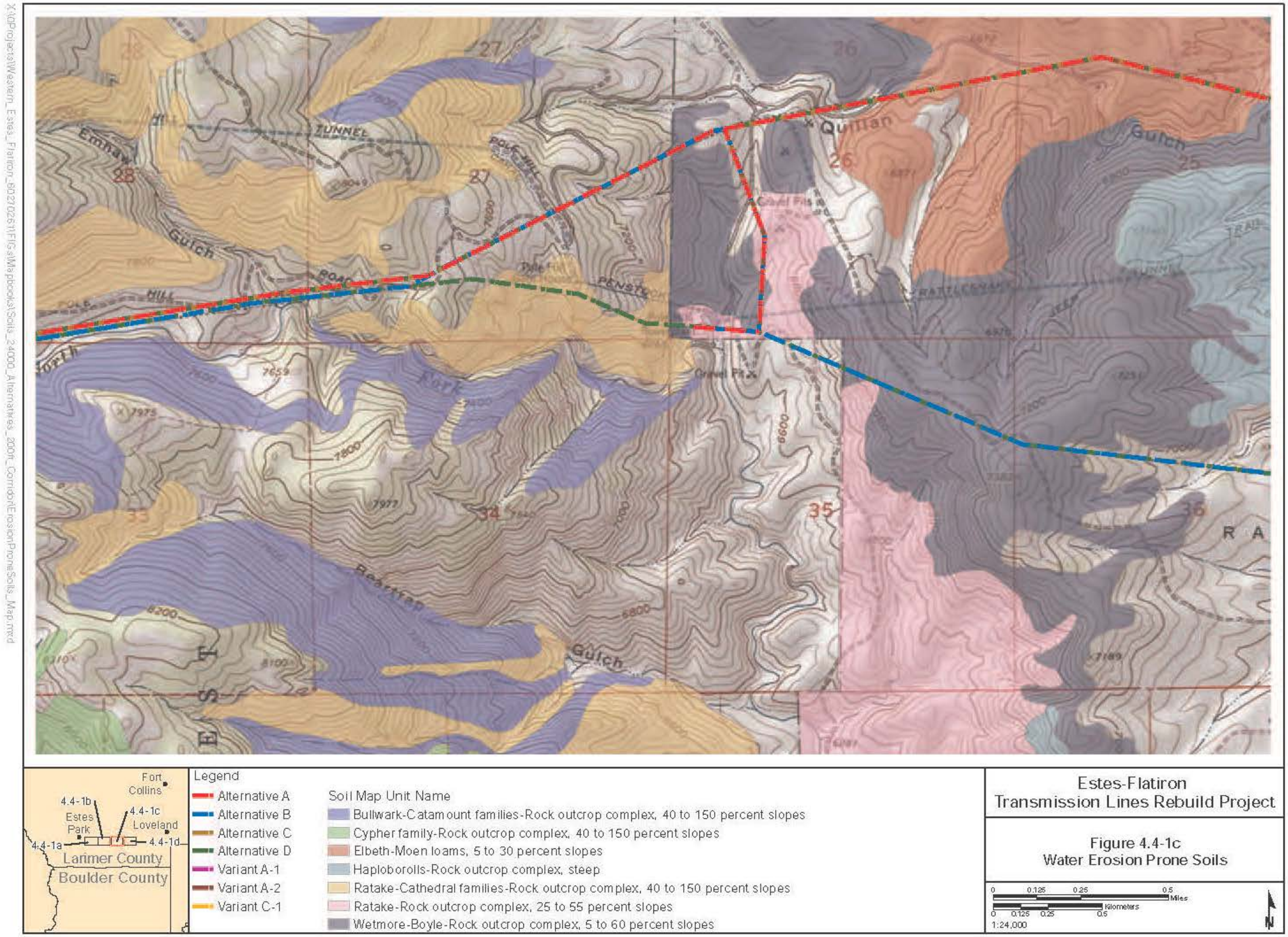


Figure 4.4-1c
Water Erosion Prone Soils

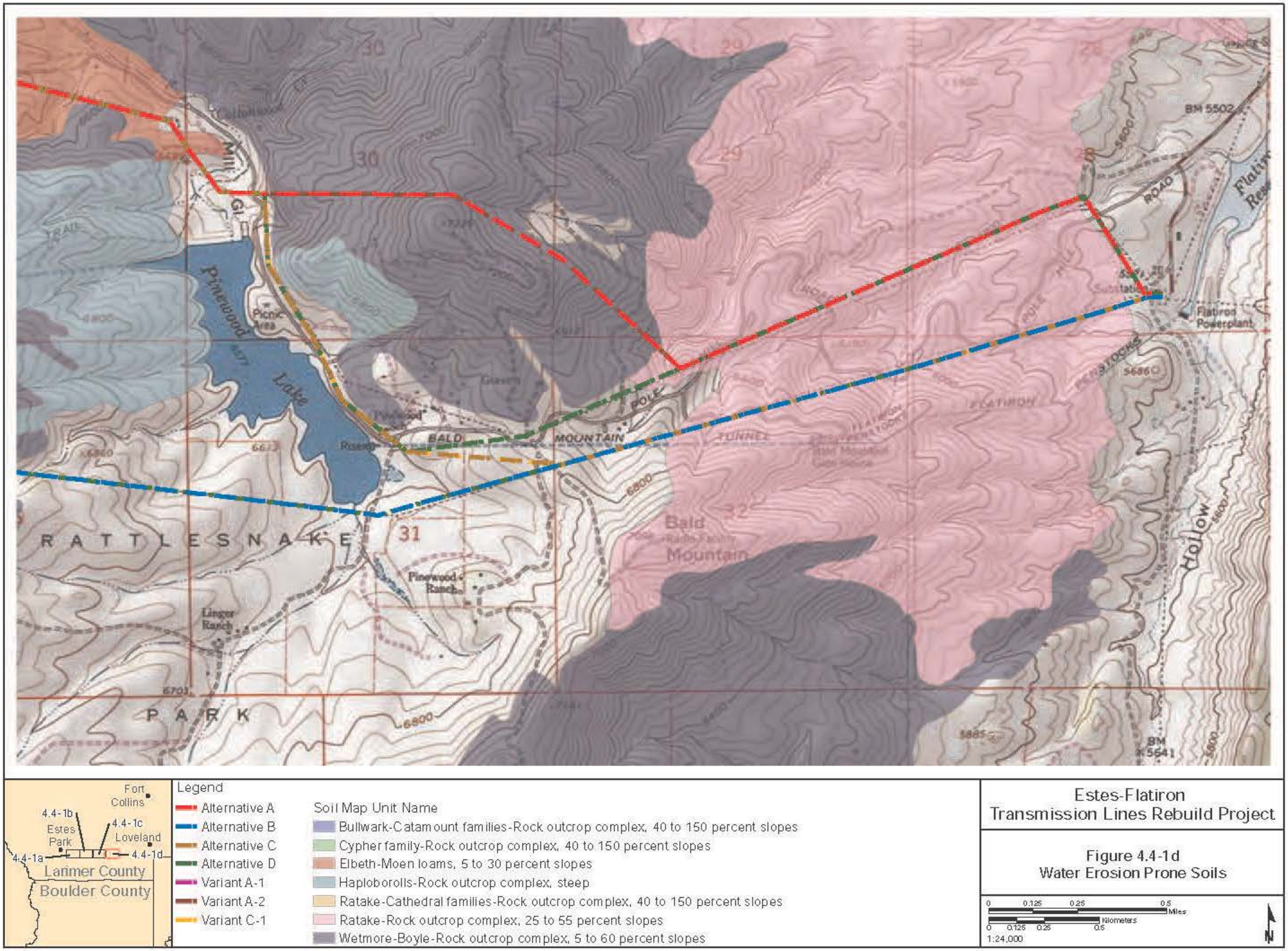
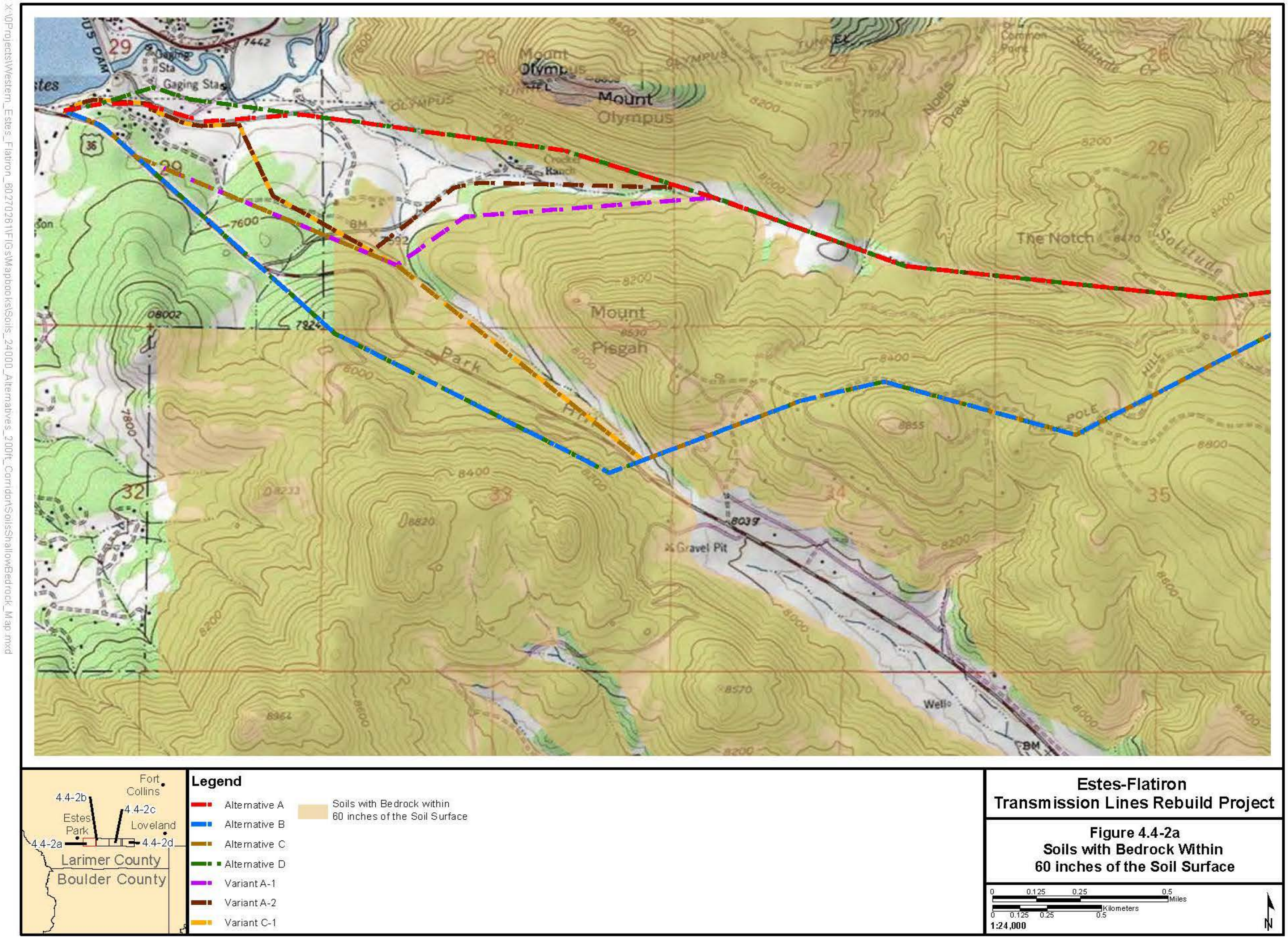
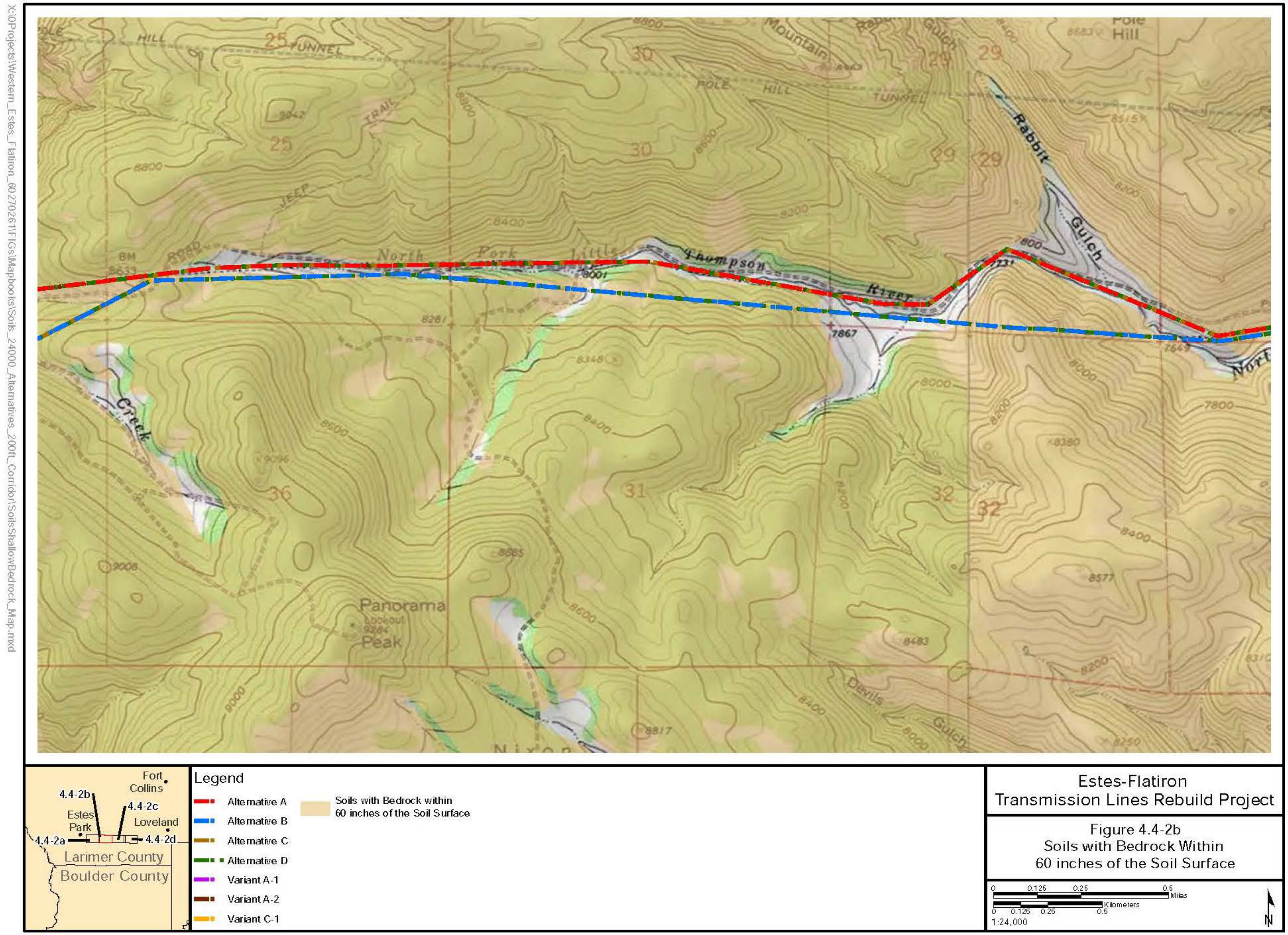


Figure 4.4-1d
Water Erosion Prone Soils



Mount Olympus
Mount Pisgah
The Notch
Gravel Pit
Crocker Ranch
Gaging Sta
Noels Draw
Park
POLE HILL
Solitude
Fort Collins
4.4-2b
4.4-2c
Estes Park
Loveland
4.4-2a
4.4-2d
Larimer County
Boulder County
Legend
Alternative A
Alternative B
Alternative C
Alternative D
Variant A-1
Variant A-2
Variant C-1
Soils with Bedrock within 60 inches of the Soil Surface
Estes-Flatiron Transmission Lines Rebuild Project
Figure 4.4-2a
Soils with Bedrock Within 60 inches of the Soil Surface
Miles
Kilometers
1:24,000
N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North Fork Little Thompson River
Rabbit Gulch
Panorama Peak
Devils Gulch
Pole Hill
Creek
Fort Collins
Estes Park
Loveland
4.4-2a
4.4-2b
4.4-2c
4.4-2d
Larimer County
Boulder County
Legend
Alternative A
Alternative B
Alternative C
Alternative D
Variant A-1
Variant A-2
Variant C-1
Soils with Bedrock within 60 inches of the Soil Surface
Estes-Flatiron Transmission Lines Rebuild Project
Figure 4.4-2b
Soils with Bedrock Within 60 inches of the Soil Surface
0 0.125 0.25 0.5 Miles
0 0.125 0.25 0.5 Kilometers
1:24,000
N

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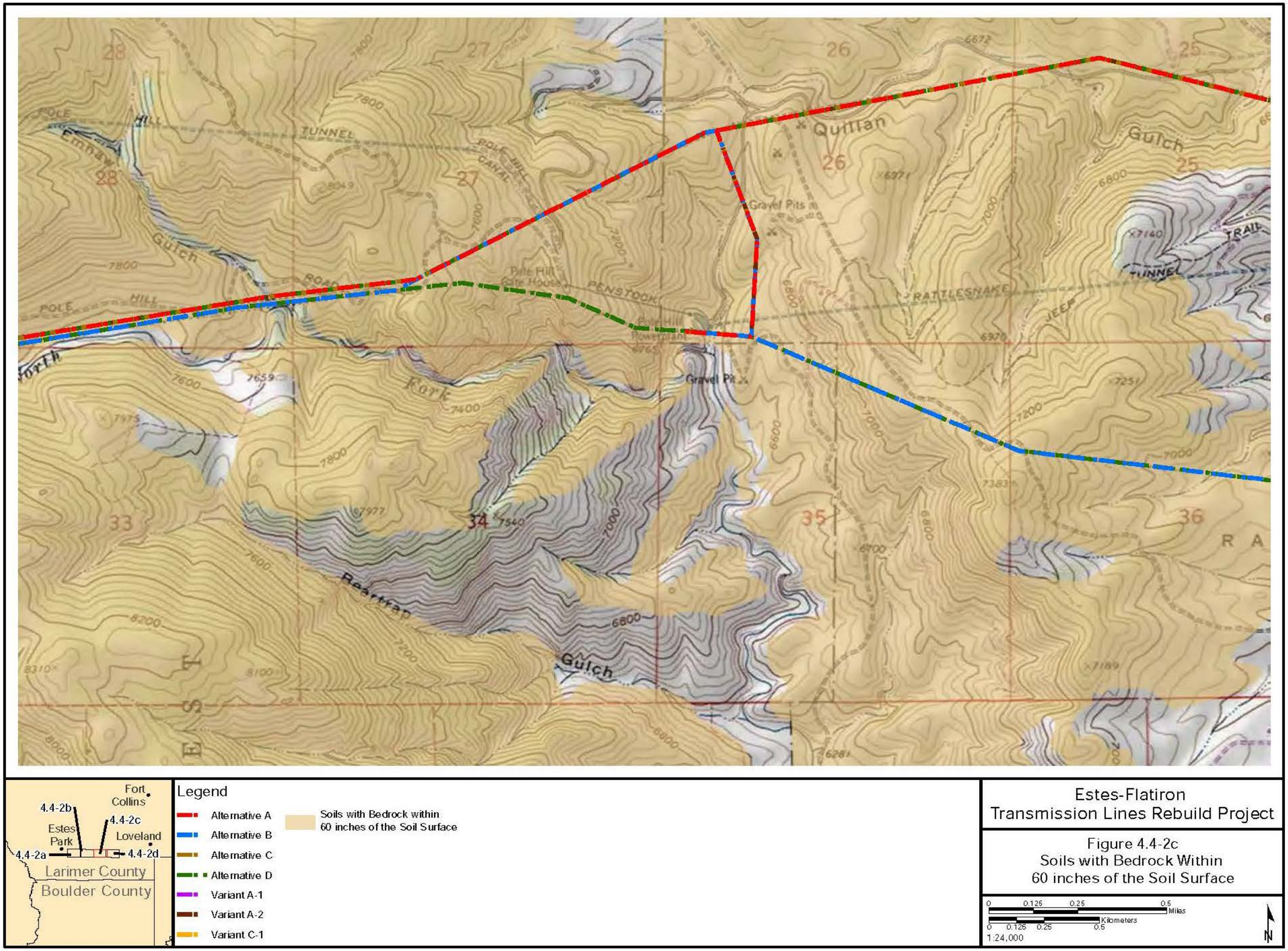
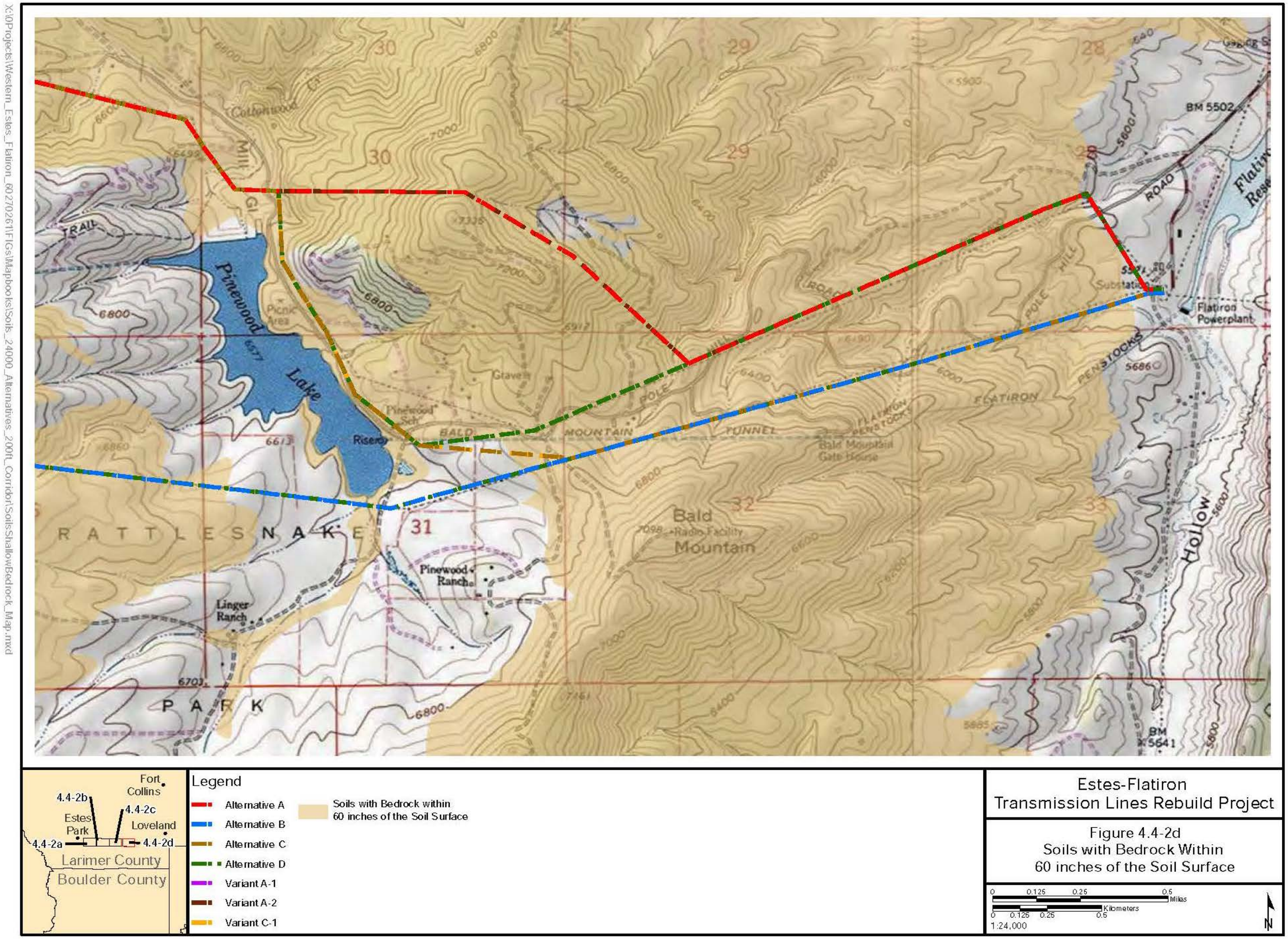


Estes-Flatiron Transmission Lines Rebuild Project

Figure 4.4-2c
Soils with Bedrock Within 60 inches of the Soil Surface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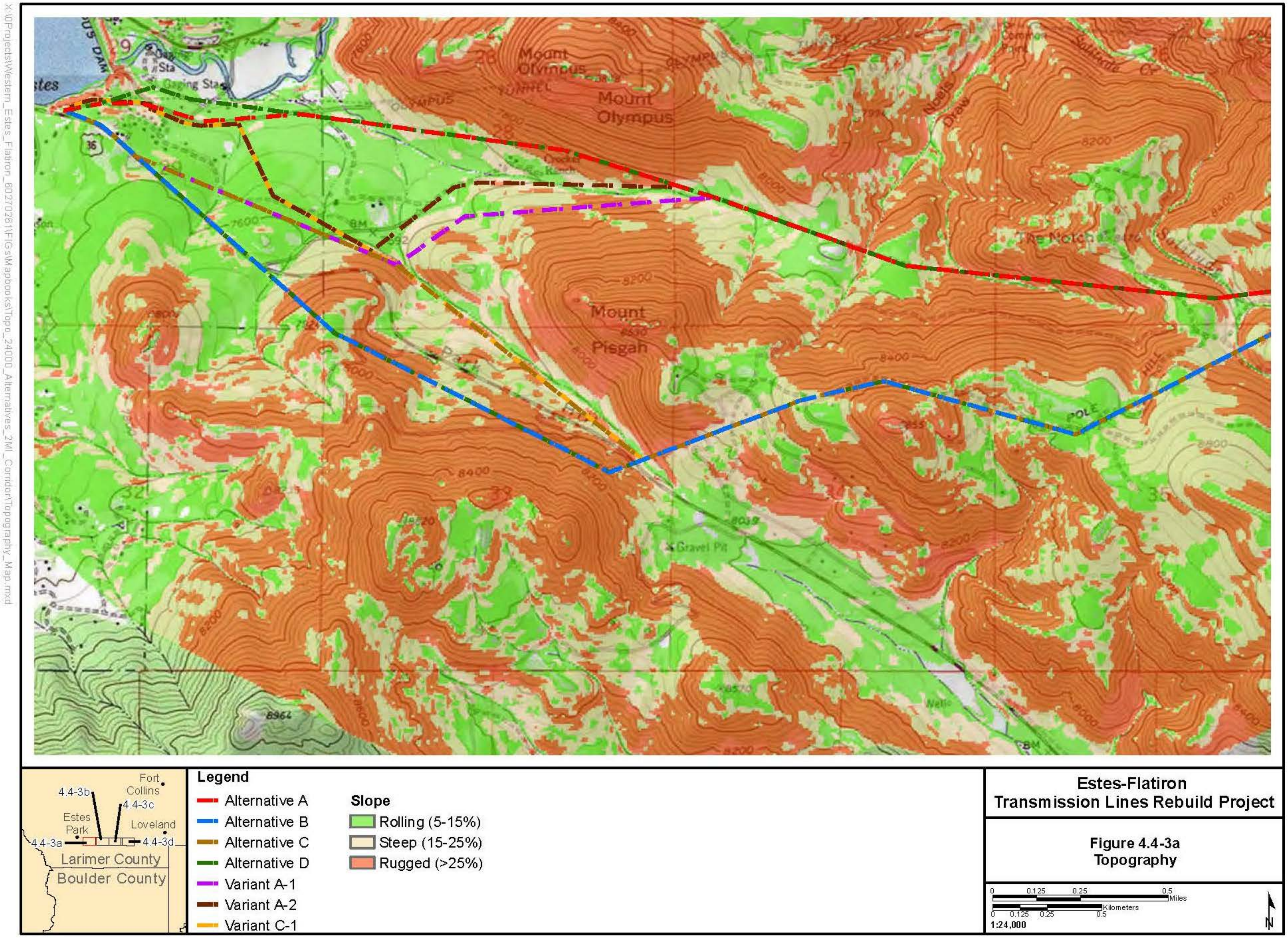
Pinewood Lake
Cottonwood Cr
Mill Gl
Picnic Area
Gravel
Pinewood Sch
Riser
BALD MOUNTAIN TUNNEL
POLE HILL ROAD
FLATIRON PENSTOCKS
Bald Mountain Gate House
RATTLESNAKE PARK
Bald Mountain
Radio Facility
Pinewood Ranch
Linger Ranch
Substation
Flatiron Powerplant
Flatiron Reservoir
Hollow
BM 5502
BM 5641
TRAIL
Fort Collins
4.4-2b
4.4-2c
Estes Park
Loveland
4.4-2a
4.4-2d
Larimer County
Boulder County
Legend
Alternative A
Alternative B
Alternative C
Alternative D
Variant A-1
Variant A-2
Variant C-1
Soils with Bedrock within 60 inches of the Soil Surface
Estes-Flatiron Transmission Lines Rebuild Project
Figure 4.4-2d
Soils with Bedrock Within 60 inches of the Soil Surface
0 0.125 0.25 0.5 Miles
0 0.125 0.25 0.5 Kilometers
1:24,000
N



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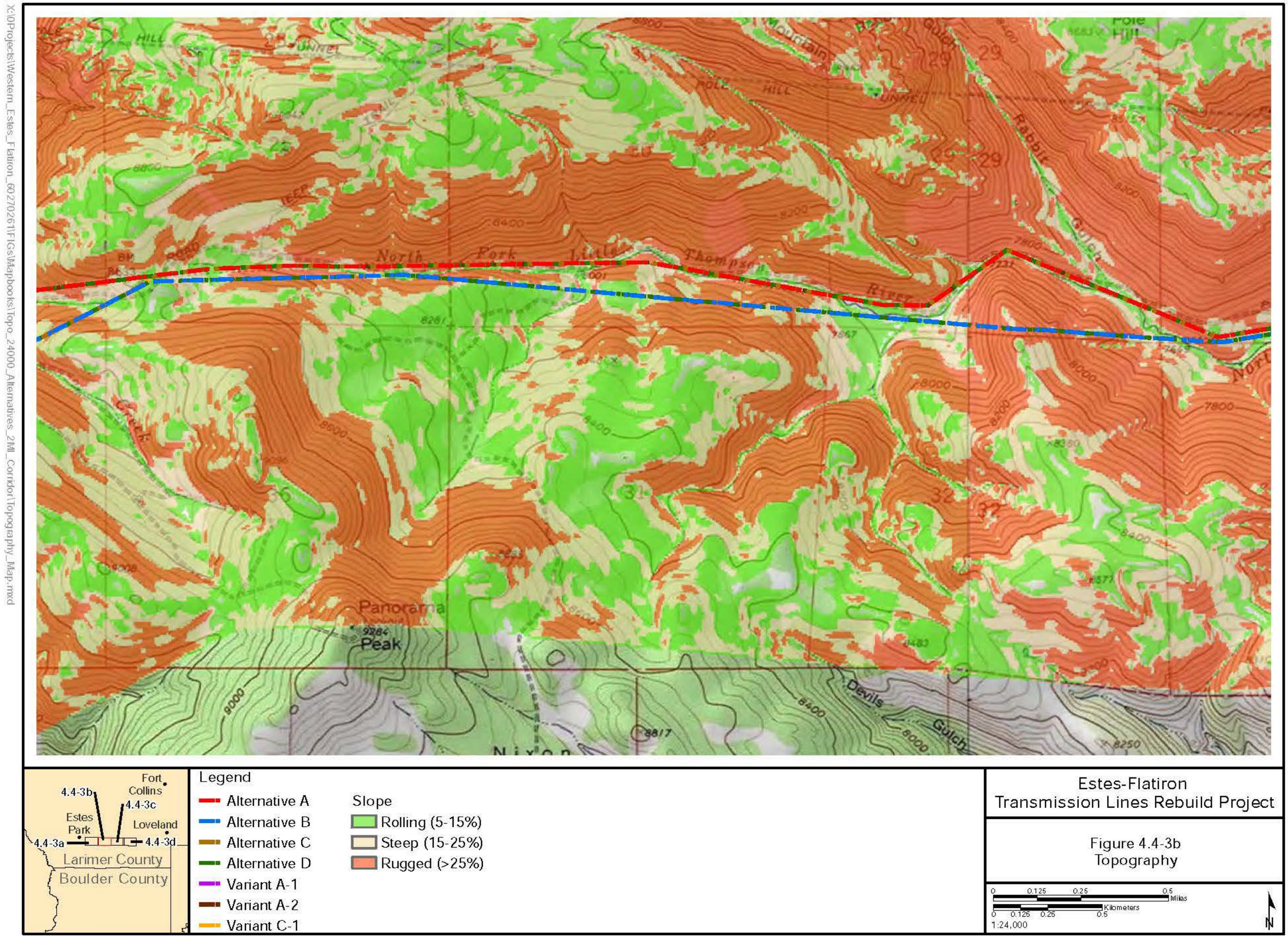
Mount Olympus
Mount Pisgah
Gravel Pit
The Notch
Noels Draw
Fort Collins
Estes Park
Loveland
4.4-3a
4.4-3b
4.4-3c
4.4-3d
Larimer County
Boulder County
Legend
Alternative A
Alternative B
Alternative C
Alternative D
Variant A-1
Variant A-2
Variant C-1
Slope
Rolling (5-15%)
Steep (15-25%)
Rugged (>25%)
Estes-Flatiron
Transmission Lines Rebuild Project
Figure 4.4-3a
Topography
0 0.125 0.25 0.5 Miles
0 0.125 0.25 0.5 Kilometers
1:24,000
N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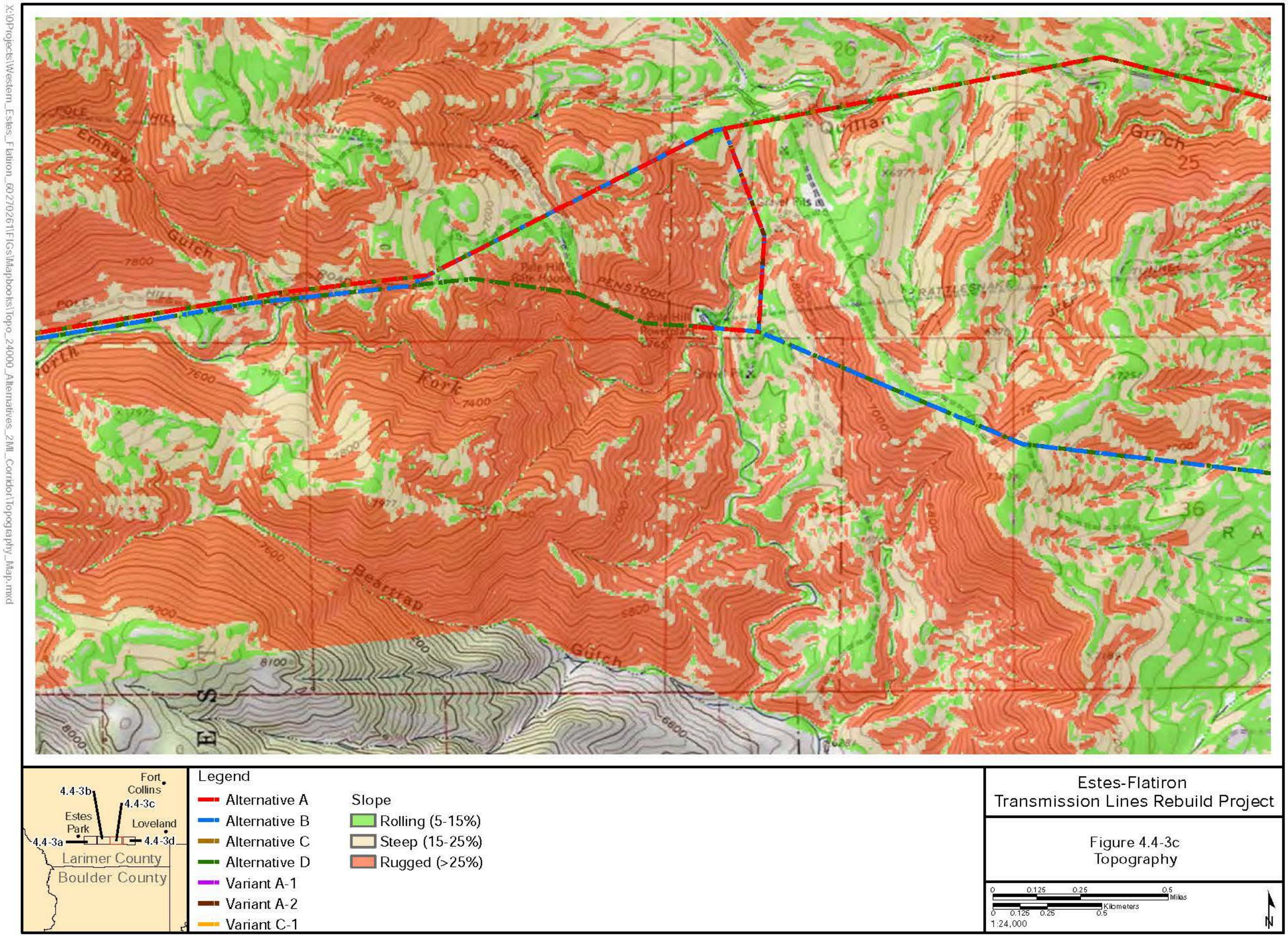
North
Fork
Little
Thompson
River
Rabbit
Gulch
Pole Hill
Panorama
Peak
Devils
Gulch
Nixon
Fort Collins
4.4-3b
4.4-3c
Estes Park
Loveland
4.4-3a
4.4-3d
Larimer County
Boulder County
Legend
Alternative A
Alternative B
Alternative C
Alternative D
Variant A-1
Variant A-2
Variant C-1
Slope
Rolling (5-15%)
Steep (15-25%)
Rugged (>25%)
Estes-Flatiron
Transmission Lines Rebuild Project
Figure 4.4-3b
Topography
0 0.125 0.25 0.5 Miles
0 0.125 0.25 0.5 Kilometers
1:24,000
N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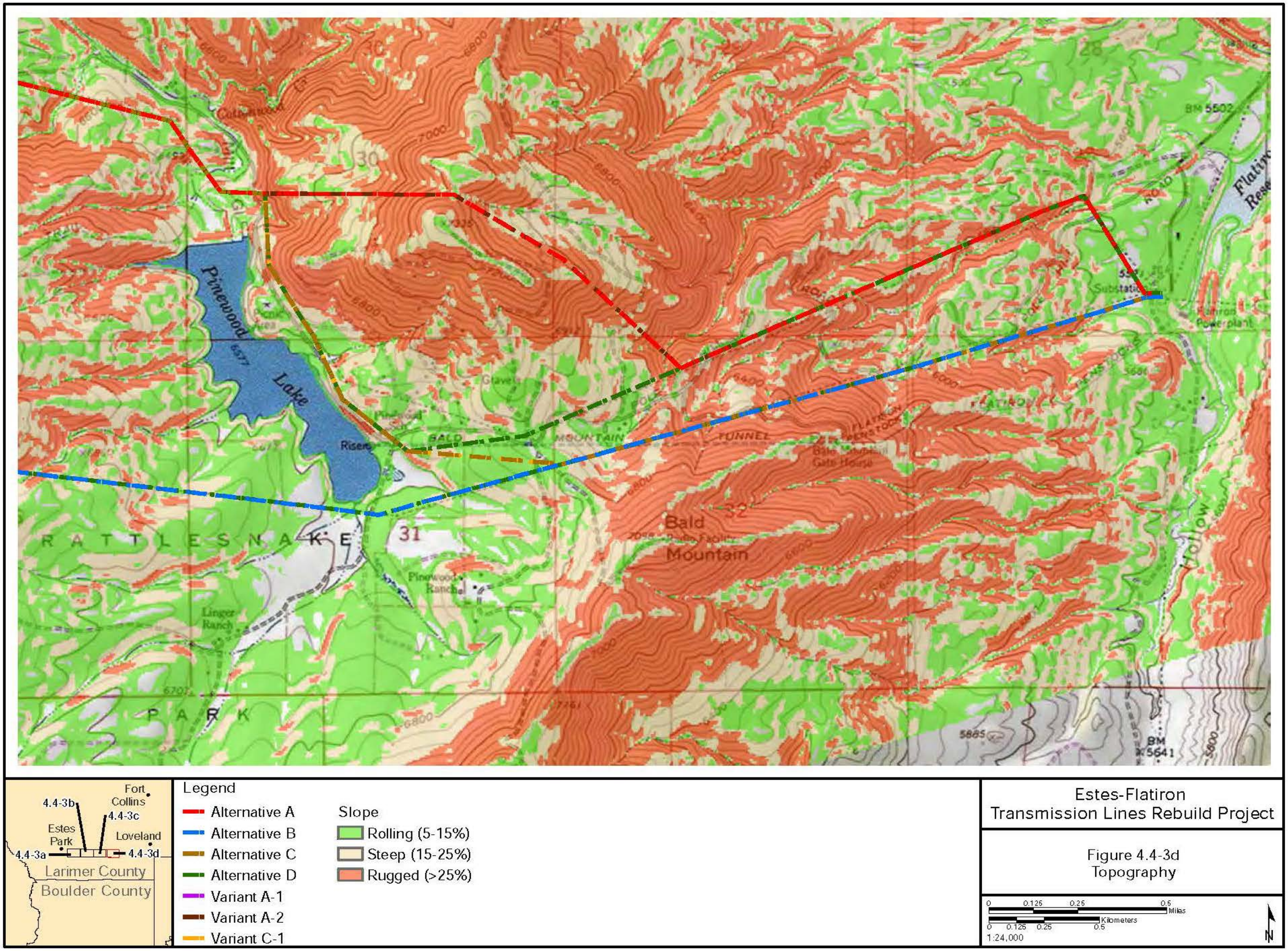
Fort Collins
Estes Park
Loveland
4.4-3a
4.4-3b
4.4-3c
4.4-3d
Larimer County
Boulder County
Legend
Alternative A
Alternative B
Alternative C
Alternative D
Variant A-1
Variant A-2
Variant C-1
Slope
Rolling (5-15%)
Steep (15-25%)
Rugged (>25%)
Estes-Flatiron
Transmission Lines Rebuild Project
Figure 4.4-3c
Topography
0 0.125 0.25 0.5 Miles
0 0.125 0.25 0.5 Kilometers
1:24,000
N
Gulch
Quillan
Pole Hill
Penstock
Rattlesnake
North Fork
Beartrap
7800
7600
7400
7000
6800


Pinewood Lake
Riser
Gravel
BALD MOUNTAIN TUNNEL
RATTLESNAKE PARK
Bald Mountain
Pinewood Ranch
Linger Ranch
Substation
Flatiron Powerplant
31
32
30
29
28
BM 5502
BM 5641
5865
Legend
Alternative A
Alternative B
Alternative C
Alternative D
Variant A-1
Variant A-2
Variant C-1
Slope
Rolling (5-15%)
Steep (15-25%)
Rugged (>25%)
Fort Collins
Estes Park
Loveland
4.4-3a
4.4-3b
4.4-3c
4.4-3d
Larimer County
Boulder County
Estes-Flatiron
Transmission Lines Rebuild Project
Figure 4.4-3d
Topography
0 0.125 0.25 0.5 Miles
0 0.125 0.25 0.5 Kilometers
1:24,000
N

Soil contamination along the proposed routes could result from material spills during construction. If spills occur, it could result in the removal and disposal of large amounts of soil. Saturated soils may have the potential to diffuse contaminants. Measures that buffer wetlands and waterbodies from refueling or fuel storage would help to prevent spills in saturated areas. Impacts to wetlands and waterbodies would be avoided or minimized by the implementation of SCP 7, SCP 9, SCP 10, SCP 11, SCP 21, SCP 22, and the EPMs. Corrosion potential pertains to potential soil-induced electrochemical or chemical action that corrodes or weakens uncoated steel. The adverse effects of corrosion on steel transmission line structures would be offset by the use of protective coating and cathodic protection. No soils that would be corrosive to concrete are located along any of the alternative transmission line ROWs. No substantive effect from corrosion would be expected for any alternative.

For much of the Project, Western has adequate existing access for construction. New, short spur roads to structure sites may be required in some locations to accommodate heavy equipment or unusual soil conditions. Whenever possible, overland travel (without grading) would occur, and existing trails and roads would be used wherever available. Where access is especially problematic (e.g., below The Notch) existing poles would be cut off and disposed of in accordance with landowner preferences for Alternatives B, C, and Variant C1, but new access would need to be established for Alternatives A and D and Variants A1 and A2. The direct adverse effect of roads is a long-term loss of soil quality and vegetation cover. Indirect adverse effects may include landslides, gullies, generation of side cast materials (loose sediment), and disruption and interception of subsurface flow of water that could alter soil moisture regimes upslope and downslope from the road. Other indirect effects may be trespassing traffic and off-road use.

Based on preliminary siting, **Figures 4.4-4a** through **4.4-4h** illustrate the soil erodibility along access roads and their proximity to waterbodies. **Table 4.4-2** provides the percent of erodible soils associated with access roads by alternative. Based on these initial estimates, Alternative A has the highest percentage of erodible soils associated with access roads. Each alternative includes roads that would be located on severely erodible soils that cross intermittent waterbodies. In locations where roads constructed on severely erodible soils cross streams, erosion and sedimentation would be of concern. SCP 3, SCP 6, SCPs 22 and 33, and other measures (Section 2.5) would prevent erosion and disturbance of soil-protecting vegetation within 100 feet of a stream, except for vegetation that would threaten the safe operation of the transmission line. Additionally, Western would comply with all storm water permit requirements.

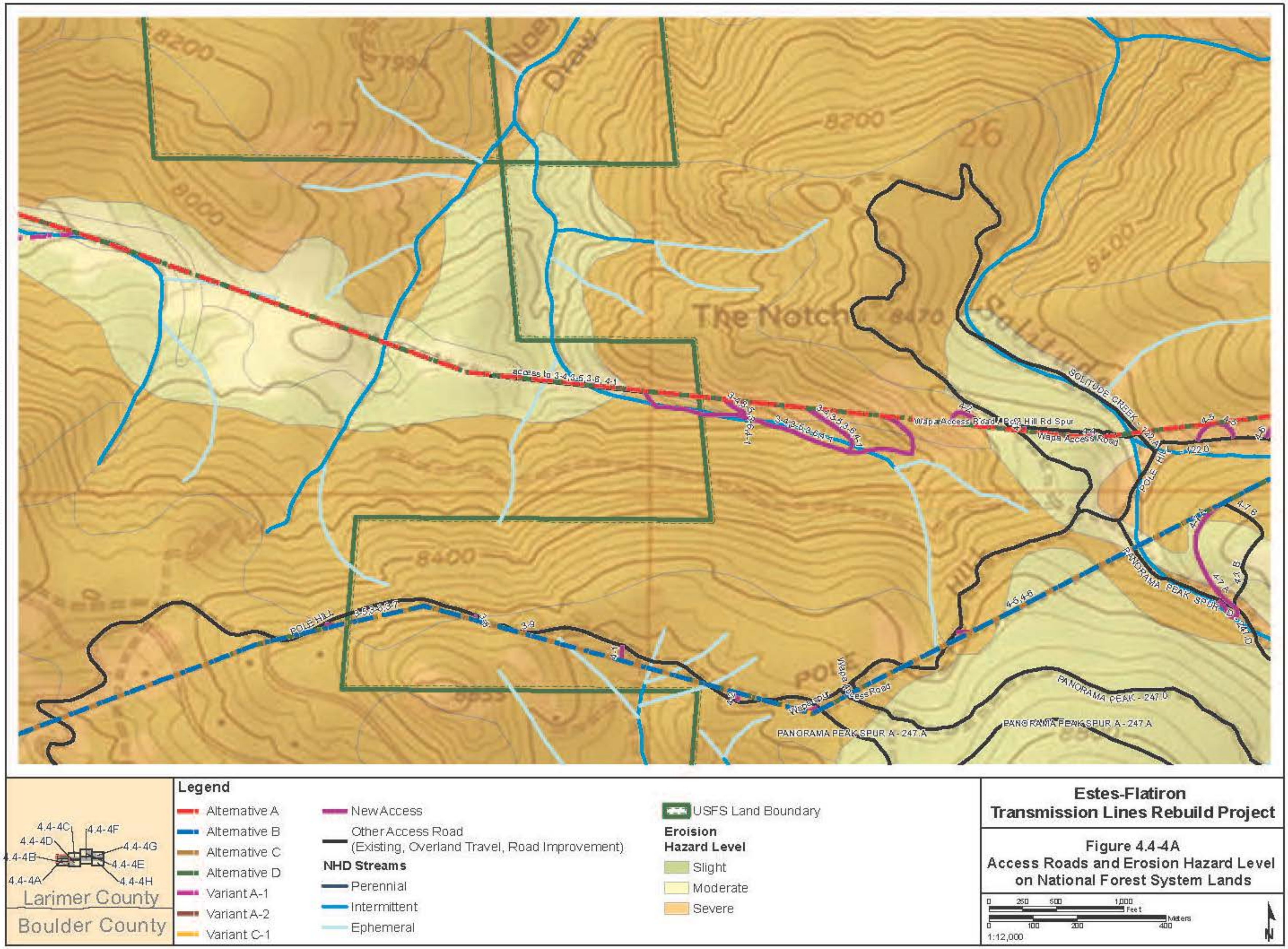
Table 4.4-2 Percent of Erodible Soils Along Access Roads*

	Alternative A	Alternative B	Alternative C	Alternative D
Low	0%	0%	0%	0%
Moderate	2.75%	40.44%	40.44%	20.89%
Severe	97.25%	59.56%	59.56%	79.11%

* Variants A1, A2, and C1 do not utilize access roads on USFS administered land.

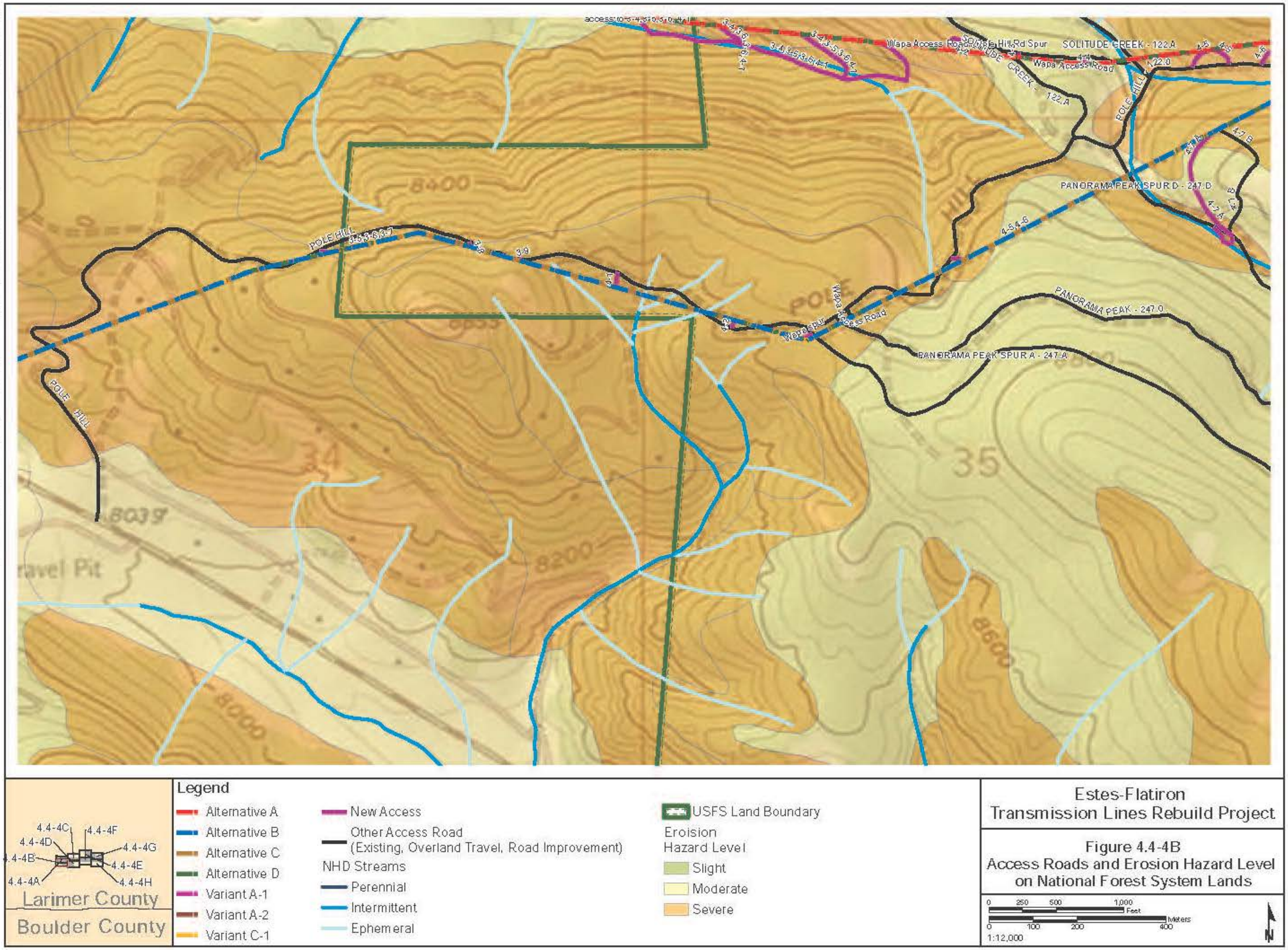
Road decommissioning, which involves reclaiming and barricading roads to inhibit vehicular use, would help reduce adverse effects. Additionally, erosion impacts would be reduced where surfacing and erosion controls are engineered into access roads. **Table 4.4-1** provides an assessment of the soil characteristics anticipated to be disturbed within the ROW for each alternative. Note that the totals exceed the total amount of potential disturbance due to the fact that some locations have more than one soil characteristic (e.g., shallow depth to bedrock and prone to water erosion).

Short-term adverse impacts such as erosion, compaction, and rutting are anticipated wherever surface disturbance occurs due to construction activities. These impacts would be limited to the ROW, staging areas, structure and pad placement, pulling and tensioning areas, and turnarounds. Where multiple passes by heavy mechanical equipment occur anywhere except existing established roadways, detrimental compaction may occur. SCPs and EPMs described in Section 2.5 would limit rutting and erosion. By implementing proposed measures and standard practices for an alternative, the impacts would be short-term.



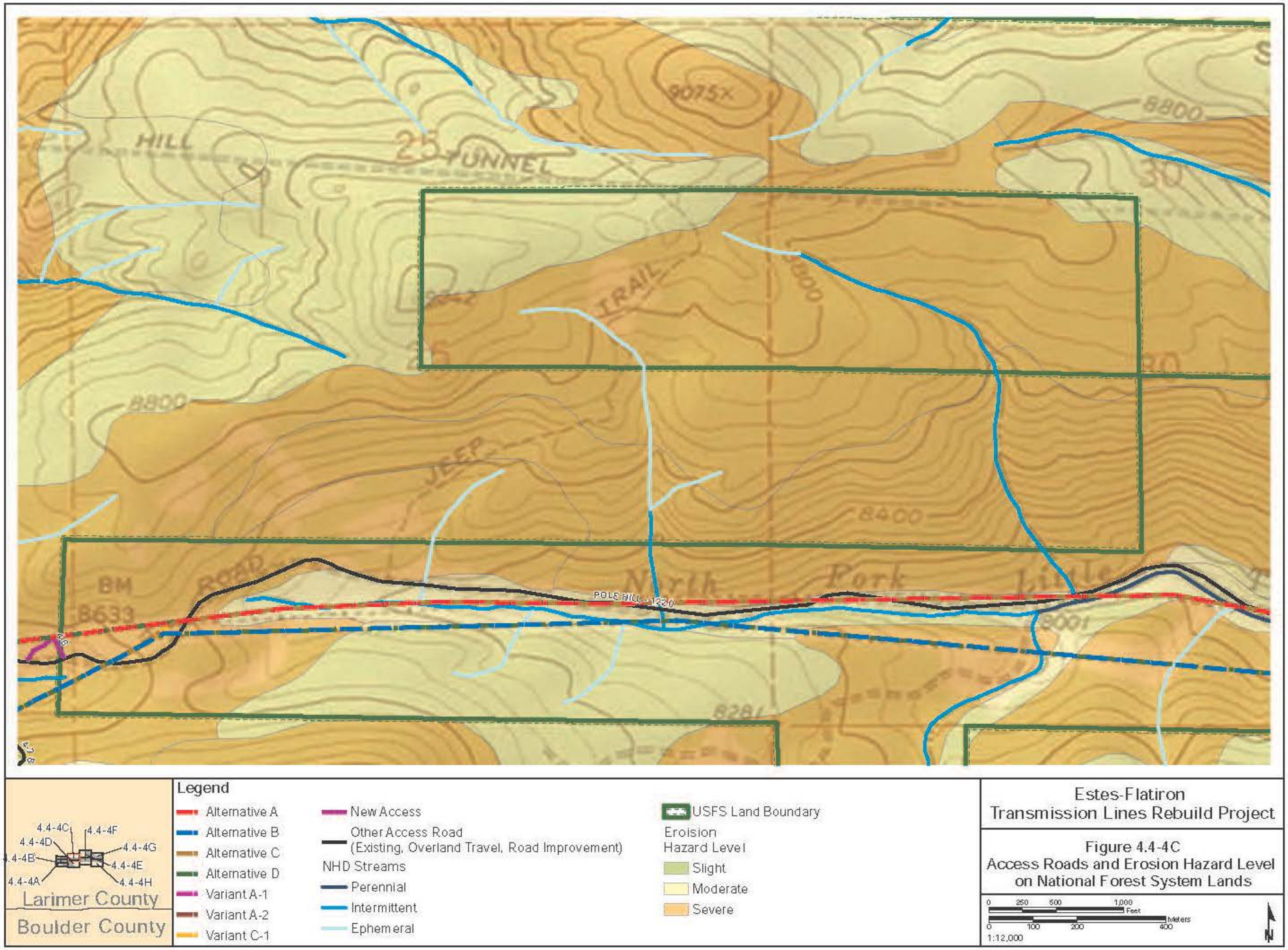
Estes-Flatiron Transmission Lines Rebuild Project

Figure 4.4-4A
Access Roads and Erosion Hazard Level on National Forest System Lands



Estes-Flatiron
Transmission Lines Rebuild Project

Figure 4.4-4B
Access Roads and Erosion Hazard Level on National Forest System Lands



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HILL
TUNNEL
9075X
8800
TRAIL
8800
JEEP
ROAD
8400
BM
8633
North
Fork
Little
POLE HILL - 1220
8001
8281
Legend
Alternative A
Alternative B
Alternative C
Alternative D
Variant A-1
Variant A-2
Variant C-1
New Access
Other Access Road (Existing, Overland Travel, Road Improvement)
NHD Streams
Perennial
Intermittent
Ephemeral
USFS Land Boundary
Eroision Hazard Level
Slight
Moderate
Severe
4.4-4A
4.4-4B
4.4-4C
4.4-4D
4.4-4E
4.4-4F
4.4-4G
4.4-4H
Larimer County
Boulder County
Estes-Flatiron Transmission Lines Rebuild Project
Figure 4.4-4C Access Roads and Erosion Hazard Level on National Forest System Lands
Feet
Meters
1:12,000
N

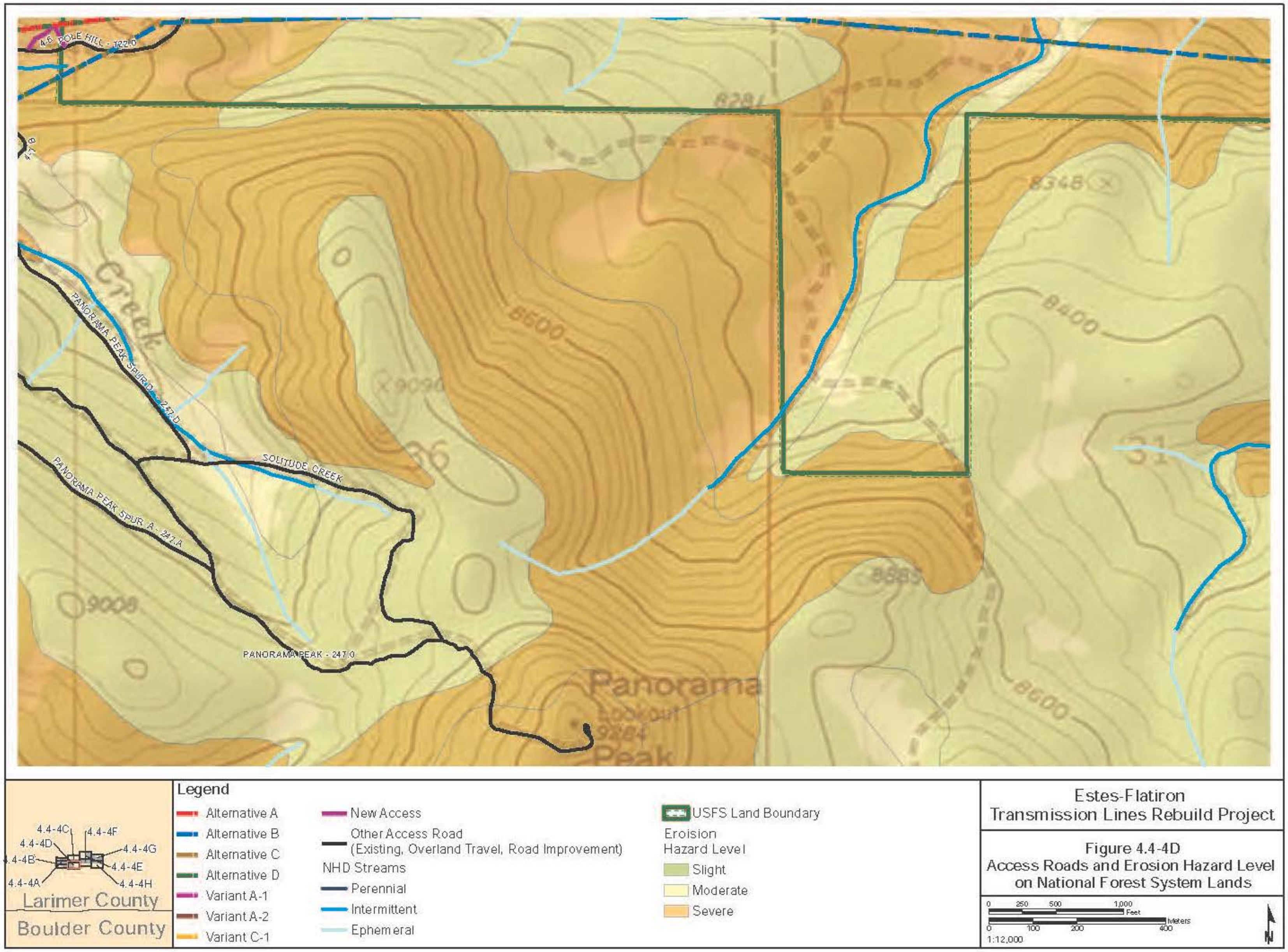
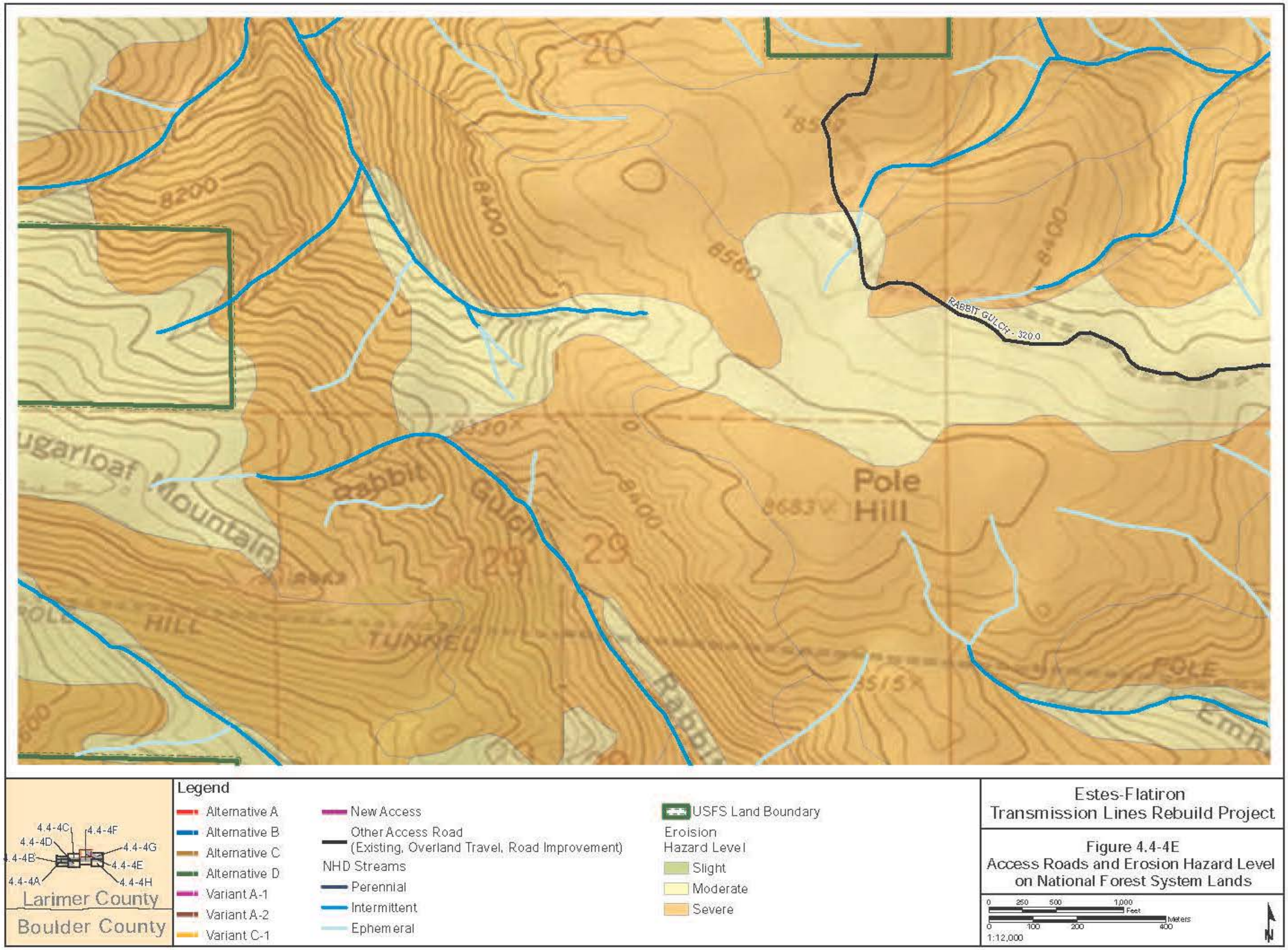


Figure 4.4-4D
Access Roads and Erosion Hazard Level on National Forest System Lands


Pole
Hill
Rabbit
Gulch
RABBIT GULCH - 320.0
Legend
Alternative A
Alternative B
Alternative C
Alternative D
Variant A-1
Variant A-2
Variant C-1
New Access
Other Access Road
(Existing, Overland Travel, Road Improvement)
NHD Streams
Perennial
Intermittent
Ephemeral
USFS Land Boundary
Eroision
Hazard Level
Slight
Moderate
Severe
Larimer County
Boulder County
Estes-Flatiron
Transmission Lines Rebuild Project
Figure 4.4-4E
Access Roads and Erosion Hazard Level
on National Forest System Lands
1:12,000

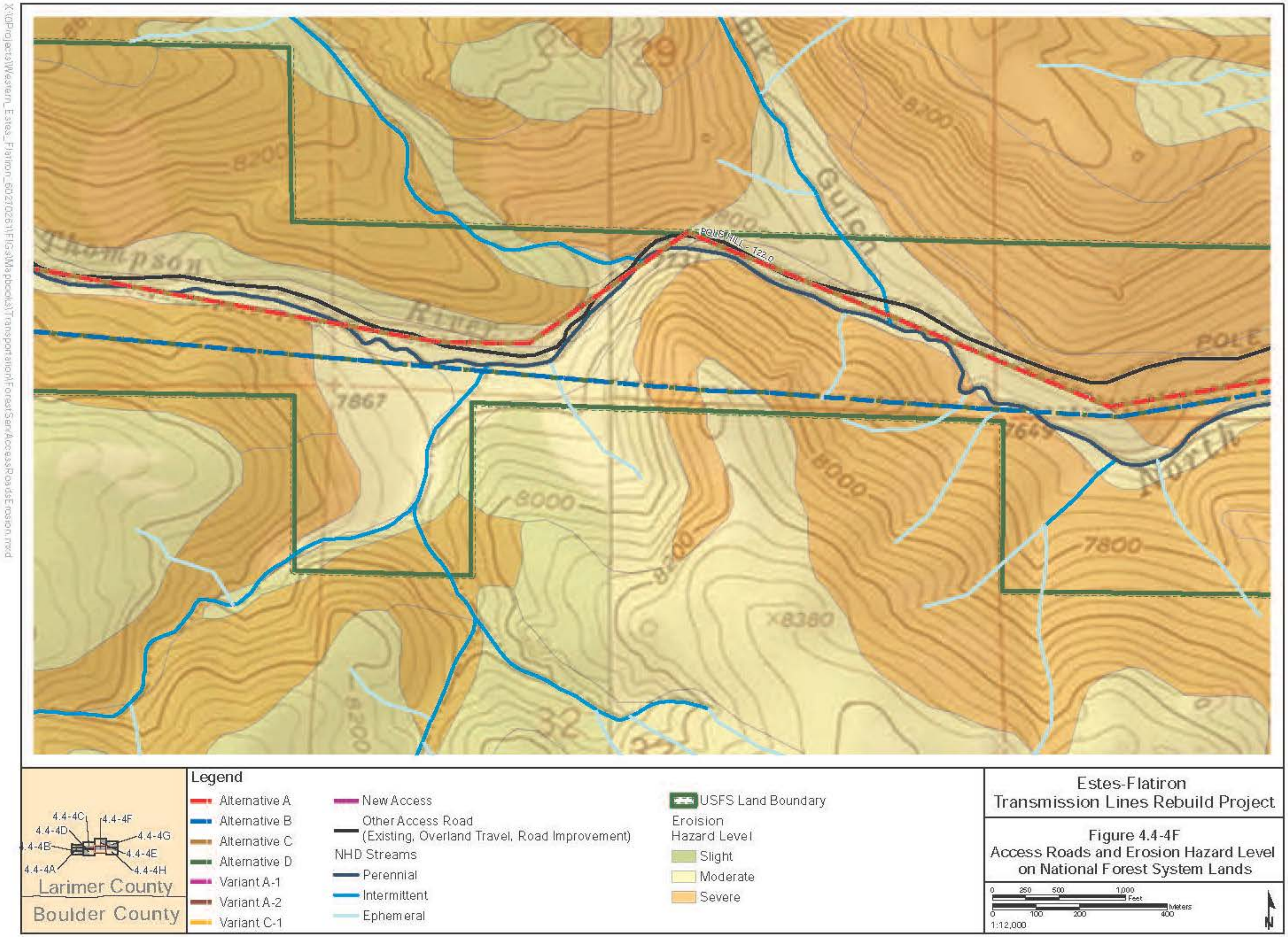
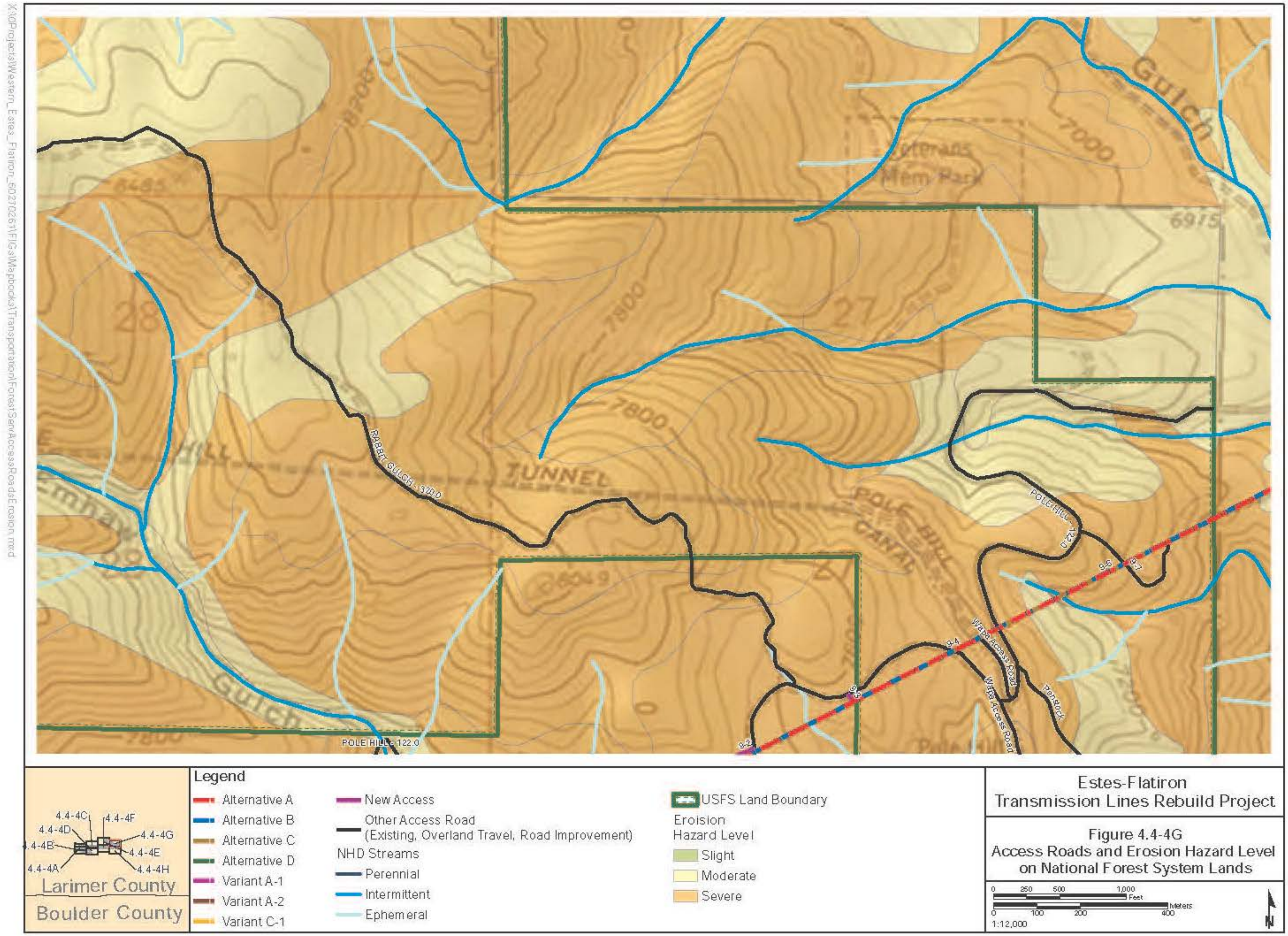


Figure 4.4-4F
Access Roads and Erosion Hazard Level
on National Forest System Lands


X:\0Projects\Western_Estes_Flatiron_60270261\FIGs\Mapbooks\Transportation\ForestServAccessRoadsErosion.mxd
RABBIT GULCH - 378.0
TUNNEL
POLE HILL
CANAL
POLE HILL - 122.0
POLE HILL - 122.0
Wapiti Access Road
Wapiti Access Road
Red Rock
Gulch
Gulch
7800
7800
28
27
Legend
Alternative A
Alternative B
Alternative C
Alternative D
Variant A-1
Variant A-2
Variant C-1
New Access
Other Access Road (Existing, Overland Travel, Road Improvement)
NHD Streams
Perennial
Intermittent
Ephemeral
USFS Land Boundary
Eroision Hazard Level
Slight
Moderate
Severe
4.4-4A
4.4-4B
4.4-4C
4.4-4D
4.4-4E
4.4-4F
4.4-4G
4.4-4H
Larimer County
Boulder County
Estes-Flatiron Transmission Lines Rebuild Project
Figure 4.4-4G
Access Roads and Erosion Hazard Level on National Forest System Lands
1:12,000
Feet
Meters
N

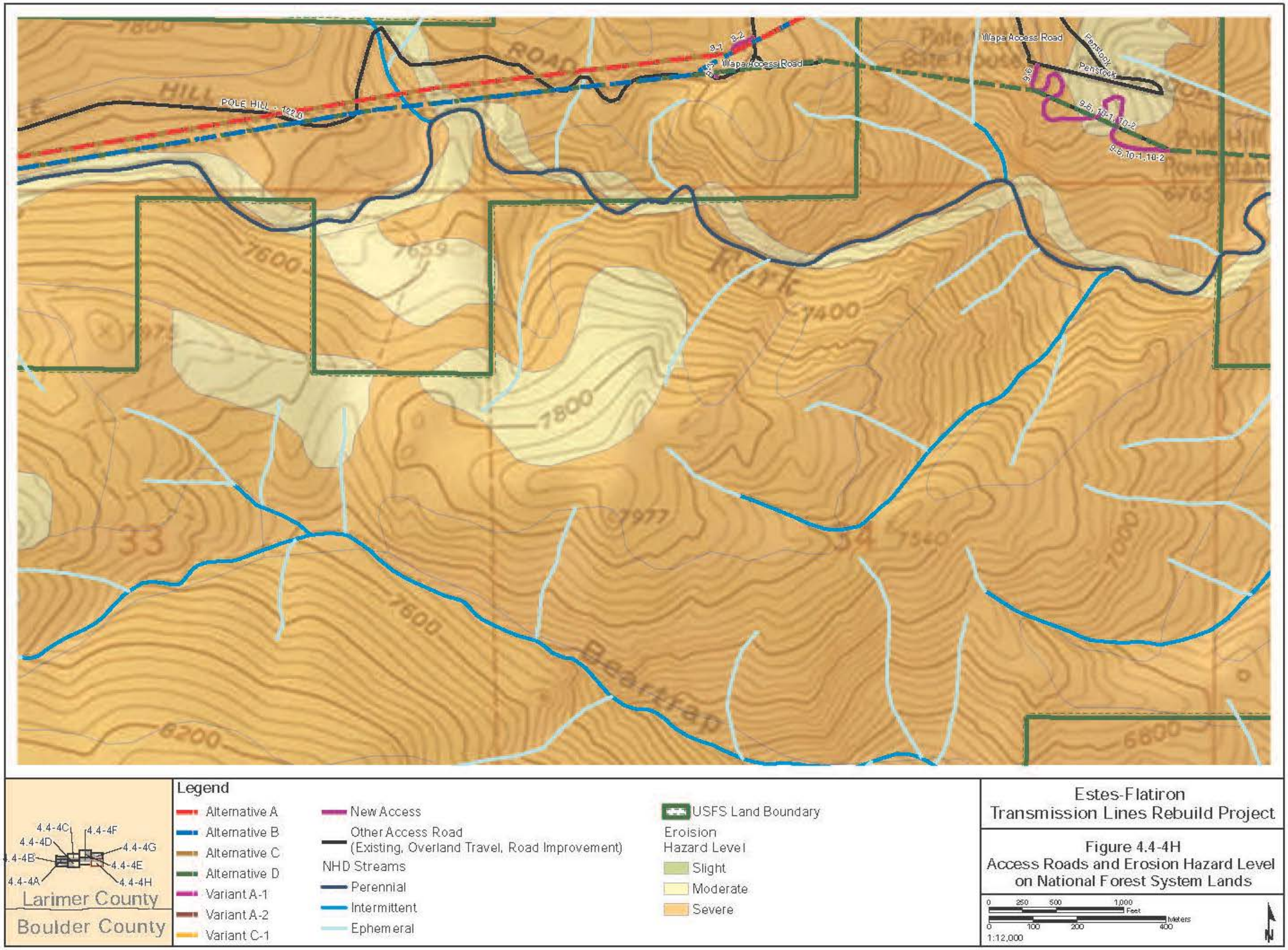


Figure 4.4-4H
Access Roads and Erosion Hazard Level on National Forest System Lands

Modifying vegetation types (e.g., converting a forested area to vegetation more compatible with transmission line operation) would modify soil productivity and soil development. Long-term moderate adverse impacts to vegetation are anticipated associated with adaptive vegetation management, specifically in areas with deciduous or coniferous tree species. Although long-term soil productivity would be altered, nutrient cycling would continue due to the continual addition of leafy vegetative litter associated with grass or shrub species.

Construction of the transmission line would result in areas of localized permanent impacts associated with the foundations of steel poles, wood poles, and new permanent access roads. Localized long-term adverse impacts to soils would result from loss of surface lands and soil productivity and quality due to installation of structure foundations. The acreage of long-term disturbance associated with each alternative is estimated under “Operation Impacts” in **Table 4.4-3**.

4.4.4 No Action Alternative

Activities associated with the maintenance and repairs of the existing line, including soil compaction and other disturbances, would result in minor short-term effects in localized areas. Under the No Action Alternative (as well as Alternative D), maintenance frequency would be expected to increase as the line ages. Natural and anthropogenic actions such as erosion, agriculture, fire, recreation, and grazing would continue to impact soil resources at present levels in the analysis area.

Direct and indirect impacts from the No Action Alternative, including the relocation of the transmission line at the Newell Lake View subdivision, would be similar in type to those described in Impacts Common to All Alternatives, but would result in greater acreage disturbance than most action alternatives. Although not quantified in **Tables 4.4-1** and **4.4-3**, over time the amount of disturbance and types of soils disturbed would be similar to those shown for Alternative D.

Repeated disturbance during operational activities within the existing ROW may increase the direct impacts to soil resources resulting from compaction and disturbance to soil cover. Indirect impacts would include an increase in runoff and erosion due to the reduction in soil cover and, in a few areas, compaction.

Impacts to soils associated with acquisition of a wider ROW on adjacent previously undisturbed soils, would include impacts to soil productivity and quality related to vegetation clearing and soil disturbance as described above in Section 4.4.3, Impacts Common to All Alternatives. On National Forest System lands, Western would not seek authorization to expand its ROW. No additional impacts beyond what is described above for maintenance activities would occur.

Short-term and long-term impacts associated with the relocation of the transmission line at the Newell Lake View subdivision would be similar to those described in Impacts Common to All Alternatives.

4.4.5 Impacts Unique to Specific Action Alternatives

4.4.5.1 Alternative A

Alternative A would impact 21 acres of water erodible soils. Soils shallow to bedrock are common (34 acres). Rock drilling may be necessary in these areas. These soils may be difficult to reclaim if disturbed. Approximately 7 acres of soils that are corrosive to steel would be impacted.

Much of the soil disturbance would occur within the existing ROW. Alternative A would result in slightly fewer direct and indirect adverse effects to soils in the Project area, in relation to the other action alternatives resulting from its relatively shorter length. However the ROW would be expanded to accommodate current requirements and regulations. Activities associated with the maintenance and repairs of the existing line, including soil compaction and other disturbances, would result in minor short-term effects in localized areas. Maintenance frequency is expected to increase as the line ages.

Table 4.4-3 Construction and Operation Impacts to Soil Resources

Alternative	Total Acres Impacted	Wind Erodible	Water Erodible	Low Revegetation Potential	Compaction Prone	Shallow Bedrock	Corrosion to Steel	Droughty
Construction Impacts: acres and percent (%)								
Alternative A	104	0	21 (20)	8 (8)	15 (14)	34 (33)	7 (7)	2 (2)
Alternative A1	419	0	21 (5)	9 (2)	15 (4)	34 (8)	7 (2)	2 (<1)
Alternative A2	355	0	18 (5)	4 (1)	16 (5)	28 (8)	7 (2)	1 (<1)
Alternative B	109	0	18 (17)	14 (13)	8 (7)	43 (40)	8 (7)	4 (4)
Alternative C	106	0	14 (13)	6 (6)	19 (18)	35 (33)	8 (8)	1 (1)
Alternative C1	370	0	14 (4)	4 (1)	19 (5)	32 (9)	8 (2)	1 (<1)
Alternative D	147	0	23 (16)	12 (8)	18 (12)	44 (30)	11 (8)	3 (2)
Operation Impacts: acres and percent (%)								
Alternative A	10	0	2 (20)	1 (10)	1 (10)	3 (30)	1 (10)	0
Alternative A1	26	0	5 (19)	2 (8)	4 (15)	8 (31)	2 (8)	1 (4)
Alternative A2	11	0	2 (18)	0	2 (18)	3 (27)	1 (9)	0
Alternative B	13	0	2 (15)	2 (15)	1 (8)	5 (39)	1 (8)	0
Alternative C	10	0	1 (10)	0	1 (10)	3 (30)	1 (10)	0
Alternative C1	26	0	4 (15)	1 (14)	5 (19)	8 (31)	2 (8)	0
Alternative D	21	0	0	0	0	0	0	0

Temporary short-term disturbances would occur within the ROW due to construction traffic along the ROW, temporary staging areas, and work areas around each structure. Permanent long-term impacts to soil resources would occur at each structure location. Adverse impacts to soils resources would be minimized by the implementation of SCP 1, SCP 6, SCP 11, SCP 22, SCP 25, SCP 26, and the EPMs.

4.4.5.2 Variant A1

Much of the soil disturbance for Variant A1 would occur within the existing ROW, except the new routing across Bullwark-Catamount family soil units (**Figure 4.4-2a**). Impacts would be similar to those described for Alternative A and Impacts Common to All Alternatives.

4.4.5.3 Variant A2

Approximately 20 additional acres of soil resources would be impacted. Variant A2 would impact 18 acres of water erodible soils. Soils shallow to bedrock are common (28 acres). Rock drilling or blasting may be necessary in these areas. These soils may be difficult to reclaim if disturbed. Approximately 7 acres of soils that are corrosive to steel would be impacted.

More soil disturbance would be anticipated due to the trenching that would be required to bury the transmission line. Soil mixing could result from trenching practices, resulting in a reduction in soil productivity caused by mixing the more productive topsoil with the subsoil. Soils with shallow bedrock would be encountered where trenching occurs. Rock may be brought to the soil surface during trenching in locations where there was no rock previously, which may inhibit revegetation. Adverse impacts to soils resources would be minimized by the implementation of SCP 1, SCP 6, SCP 11, SCP 22, SCP 25, SCP 26, and the EPMs.

4.4.5.4 Alternative B

Within the ROW for Alternative B, soil inventories indicate that shallow soils are common. Rock drilling may be necessary in these areas. These soils may be difficult to reclaim if disturbed. Approximately 43 acres of soils shallow to bedrock would be impacted by Alternative B. Approximately 14 acres of LRP soils would be impacted by Alternative B. Approximately 8 acres of soils that are corrosive to steel would be impacted. The adverse effects of corrosion on steel transmission line structures would be offset by the use of protective coating and cathodic protection. Adverse impacts to soils resources would be minimized by the implementation of SCP 1, SCP 6, SCP 11, SCP 22, SCP 25, SCP 26, and the EPMs.

4.4.5.5 Alternative C

Alternative C would impact the least acreage of soil resources overall. Soil inventories indicate that shallow soils are common. Rock drilling may be necessary in these areas. These soils may be difficult to reclaim if disturbed. Approximately 35 acres of soils shallow to bedrock would be impacted by Alternative C. Approximately 6 acres of LRP soils would be impacted by Alternative C. Approximately 8 acres of soils that are corrosive to steel would be impacted. The adverse effects of corrosion on steel transmission line structures would be offset by the use of protective coating and cathodic protection.

Under this alternative, certain sections of Pole Hill Road (USFS Road 122) would be reconstructed. Grinding, chipping, or blasting could be used to level the grade on the west end of Pole Hill Road. Road reconstruction would result in additional bare ground and loose soils. No imported aggregate would be used to surface roads. Adverse impacts to soil resources from the road reconstruction could include compaction, increased runoff, and erosion. However, in the long term, reconstruction of this road could be a beneficial impact to soil resources, if the proper best management practices are utilized and drainage is improved, due to the current rates of erosion from this unimproved native surface road. Section 4.5.5, Water Resources, provides additional detail on erosion and sedimentation impacts related to the Pole Hill Road reconstruction. Adverse impacts to soils resources would be minimized by the implementation of SCP 1, SCP 6, SCP 11, SCP 22, SCP 25, SCP 26, and the EPMs.

4.4.5.6 Variant C1

Impacts for Variant C1 would be similar to those described for Alternative A and Impacts Common to All Alternatives. However, more soil disturbance would be anticipated due to the trenching that would be required to bury the transmission lines. Soil mixing could result from trenching practices, resulting in a reduction in soil productivity. Soils with shallow bedrock would be encountered where trenching occurs. Rock may be brought to the soil surface during trenching in locations where there was no rock previously. Where blasting would be needed for trenching or vault construction, additional rock would be brought to the surface.

Under this alternative, certain sections of West Pole Hill Road (USFS Road 122) would be reconstructed. Grinding, chipping, or blasting could be used to level the grade on the west end of West Pole Hill Road. Road reconstruction would result in additional bare ground and loose soils. No imported aggregate would be used to surface roads. Adverse impacts to soil resource from the road reconstruction could include compaction, increased runoff, and erosion. However, in the long term, reconstruction of this road could be a beneficial impact to soil resources, if the proper best management practices are utilized and drainage is improved, due to the current rates of erosion from this unimproved native surface road. Section 4.5.5 provides additional detail on erosion and sedimentation impacts related to the West Pole Hill Road reconstruction. Adverse impacts to soils resources would be minimized by the implementation of SCP 1, SCP 6, SCP 11, SCP 22, SCP 25, SCP 26, and the EPMs.

4.4.5.7 Alternative D

Alternative D would rebuild both the existing North and South lines in-kind as single circuit lines using structures very similar to those currently in use. The existing ROWs would be expanded as needed and minor adjustments made to the alignments where necessary to comply with Federal requirements.

Impacts for Alternative D would be similar in type to Alternative A and those described in Impacts Common to All Alternatives, but would result in greater acreage disturbance than most action alternatives. Total acres of soils with limitations impacted by Alternative D are listed in **Tables 4.4-1** and **Tables 4.4-3**. Within the ROW for Alternative D, soil inventories indicate that fewer soils with limitations occur than compared to the other action alternatives. Approximately 44 acres of soils have hard bedrock within 60 inches of the surface. Rock drilling may be necessary in these areas. These soils may be difficult to reclaim if disturbed. Approximately 23 acres of soils that would be impacted by Alternative D are highly water erodible.

4.4.6 Mitigation

Impacts to soil resources would not be significant for any alternative due to the implementation of SCPs and EPMs (Section 2.5). Because of this, no additional measures are recommended.

4.4.7 Residual Impacts

Residual impacts would result from the removal of soils by Project footprints and permanent access roads. These adverse impacts would be long-term but not significant.

All alternatives would result in minor adverse impacts with the exception of Variants A2 and C1. Variants A2 and C1 would result in moderate impacts due to trenching and burying of the transmission line.

4.4.8 Irreversible and Irretrievable Commitments of Resources

Long-term to permanent adverse impacts would be associated with structure footprints and permanent access roads. An irretrievable loss in soil productivity and soil quality would occur where maintenance roads and transmission line structures are located. Soils whose characteristics could limit reclamation success also could exhibit long-term impacts.

4.4.9 Relationship between Short-term Use and Long-term Productivity

Where surface disturbance occurs, short-term adverse impacts are anticipated due to construction activities and would be limited to the temporary ROW, staging areas, structure and pad placement, pulling and tensioning areas, and turnarounds. Where multiple passes by heavy mechanical equipment occur, detrimental compaction may occur. With implementation of SCPs and EPMs (Section 2.5), the impacts should be temporary.

Long-term to permanent adverse impacts would be associated with structure footprints and permanent access roads. An irretrievable loss in soil productivity and soil quality would occur where structures are located. Continued traffic and any other surface disturbance associated with operation and maintenance activities also would be considered a long-term impact.

4.5 Water Resources and Floodplains

Potential impacts to water resources have been analyzed within the analysis area, defined as a 200-foot-wide area for existing ROW and 300-foot-wide for new alternatives, in addition to a 1-mile buffer surrounding the alternatives.

Scoping concerns, existing conditions, potential Project activities and locations, and agency environmental commitments formed the basis of the water resources assessment. DOE regulations in 10 CFR Part 1022 require public notification of floodplain involvement (DOE 2003). Agency environmental procedures, including policies from Western and DOE, as well as permit requirements from CDPHE and the Forest Plan, identified most concerns for the water resources assessment. In combination with public scoping comments, related issues focused on the following:

- Disturbance of stream channels and banks, roads, and culverts;
- Accelerated water erosion and sedimentation;
- Degraded water quality;
- Reduced floodplain conveyance and floodplain values; and
- Disruption of water wells and septic tank filter fields.

4.5.1 Methodology

The impact evaluation first reviewed inputs from the scoping process. Baseline conditions were inventoried from existing information and new fieldwork. Project activities were examined, and then Western's SCPs and Federal and state regulatory provisions that direct the activities were reviewed. The SCPs and other measures to protect water resources and reclaim disturbed sites have been included by Western as part of the Project. These measures were compared to evaluate for potential construction and maintenance effects on floodplains and streams, water quantity, and water quality. Potential changes from the baseline setting were then qualitatively examined with respect to significance criteria.

4.5.2 Significance Criteria

4.5.2.1 Surface Water

A significant impact to surface water would result if any of the following were to occur from constructing or operating the Project or an action alternative:

- Contamination of surface water from erosion or storm water runoff that would result in a violation of Federal and/or state water quality standards.
- Alteration of the existing drainage pattern of the area that would result in off-site erosion or sedimentation.

- Surface water impacts that would violate Section 404 of the CWA or other applicable surface water regulations, including state-established standards for designated uses.

4.5.2.2 Groundwater

A significant impact to groundwater would result if any of the following were to occur from constructing or operating the Project or an action alternative:

- Spills of fuel or other fluids that would reduce groundwater quality below applicable regulations by uncontrolled seepage into water-bearing zones used for domestic supplies.
- Excavation disturbance that would result in a measurable reduction of groundwater flow to springs or wells.

4.5.2.3 Floodplains

A significant impact to floodplains would result if any of the following were to occur from constructing or operating the Project or an action alternative:

- Modification of a floodplain that would impede or redirect flood flows resulting in property damage on- or off-site.
- Increased scouring during a flood event that would result in structural or property damage.
- Spills or releases of fuels, hazardous or toxic materials, or other contaminants stored within a FEMA-designated SFHA that would substantially affect floodplain natural resources or functions.

4.5.3 Impacts Common to All Alternatives

Potential effects on streams, and the watersheds that contribute to them, could result from increased runoff and accelerated water erosion along roads and at stream crossings. Existing roads could require repairs, upgrades or improvements and would undergo heavier traffic during construction, which could further concentrate runoff along vehicle tracks and encourage sediment delivery over the short-term. Western's SCPs, including SCP 3, SCP 6, SCP 7 and others, would avoid this. New road construction would take place to a limited extent, and would be limited to locations where there is currently no existing access along some parts of some alternatives. This is further described in Chapter 2.0, and distinguished below in separate alternative discussions. Where it would occur, construction of new ROW segments would reduce canopy cover and increase the amount of bare ground and loose soil. This could increase the potential for sediment and runoff to be directed into streams, but again, Western's SCPs, ongoing construction inspections, and post-construction monitoring and maintenance would avoid adverse runoff and sediment effects or reduce them to negligible or minor levels.

A number of small waterbodies or drainage-ways would be spanned during construction under any alternative. These are described further in Chapter 3.0, Sections 3.5 and 3.6. As can be seen in **Table 3.6-1**, typical channel crossings are less than 5 or 6 feet wide even during their higher flows. Most only flow for part of the year, sometimes only days or weeks, in response to storms and snowmelt. Some locations have an adjacent wetland fringe; others only contain upland vegetation. Although surface water impacts could occur at these small crossings, the potential for adverse effects is minimal. Impacts from runoff, erosion, or sedimentation would be avoided or reduced on any alternative by Project design and implementation of Western's SCPs, EPMs, and by storm water management best management practices. Best management practices would complement Western's SCPs, and would be implemented in accordance with a Storm Water Pollution Prevention Plan submitted to CDPHE for review and approval. Because of these practices, the overall potential for impacts to water quantity or water quality would be avoided or be reduced to far less than significant levels for any alternative.

In accordance with CWA Section 402, an approved permit from the state would be required for the Project under the General Permit for Stormwater Discharges Associated with Construction Activities from the CDPHE. Compliance with the provisions under this permit (CDPHE COR030000) would minimize and mitigate surface water impacts from storm water runoff or snowmelt. Any adverse impacts that might occur after the implementation of SCPs and compliance with permit provisions would be less than significant, short-term direct impacts.

Additional adverse impacts to surface water or groundwater could occur from spills or leaks of fuel or lubricants, from discharge of groundwater at excavations, from access road construction at stream crossings, or from releases of contaminants at staging areas or concrete facilities. Implementation of SCPs as described in Section 2.5, would avoid or reduce these potential impacts to water resources. Any remaining impacts would be short-term direct impacts and would be less than significant. Spill responses and post-construction clean-up and monitoring would mitigate any impacts that occurred. Numerous SCPs are directly related to managing construction activities to avoid water resource features, minimize construction activities near them, or to mitigate disturbance, preserve flow conveyance, and encourage channel and bank stability. Refer to Section 2.5 for these measures. CWA Section 404 and 401 permit requirements would apply to the Project, since waters of the U.S., including wetlands, occur along the proposed alternative routes (see Section 3.6) and may be disturbed by access roads associated with their construction. Under Section 404, Nationwide Permit 12 (NWP 12, Utility Line Activities) would likely apply to the construction of the line structures, foundations, access roads, and temporary structures or work needed to complete the Project (FR, Vol. 77, No. 34, Part III, February 21, 2012). Compliance with NWP 12 provisions would limit any impacts to less than significant, short-term, direct impacts. Potential impacts to shallow groundwater, wells, or septic systems could occur from excavating structure foundations. Implementation of the SCPs would generally avoid these impacts. Further discussion of potential effects related to these resources is presented below for the specific action alternatives.

4.5.4 No Action Alternative

Under the No Action Alternative, some impacts would occur to water resources. These would mainly result from maintenance activities conducted over a longer period of time than that of an action alternative and the construction of access roads where current access is limited or non-existent. Direct impacts could occur in the form of short-term increases in surface water turbidity and sediment transport from stream crossing disturbance during ROW expansion, access road construction, vegetation removal, and maintenance activities. Direct impacts could range in intensity from “no effect” to minor, but would be avoided or minimized by existing practices that are the same or similar to the SCPs currently employed by Western. Relocation of the ROW in the Newell Lake View subdivision area would generate negligible to minor local, short-term direct surface water effects similar to those from maintenance activities elsewhere along the ROW. Only negligible temporary impacts to groundwater or floodplain resources would occur. Indirect impacts, such as water-related effects on aquatic habitat or wetlands, are described in Sections 4.6, 4.9, and 4.10.

No long-term effects to water resources would occur under the No Action Alternative.

4.5.5 Impacts Unique to Specific Action Alternatives

4.5.5.1 Alternative A and Variant A1

Implementation of the proposed SCPs would generally address potential impacts to surface water from Alternative A, and compliance with permit provisions set by the USACE would further avoid or mitigate impacts at surface water crossings where construction would be necessary. Approximately 43 small waterbodies would be crossed by equipment traffic under Alternative A. As listed in **Table 3.5-2**, four waterbodies would involve perennial streams, 27 would involve intermittent streams, and 11 would involve ephemeral streams. If necessary to allow transport of equipment or materials, or to minimize impacts from repeated traffic, culverts or stabilized low-water crossings would be used to reduce impacts and allow vehicle and equipment traffic at selected stream crossings.

On the basis of successful implementation of the proposed SCPs and EPMs, and compliance with permit provisions generated through review and approval of applicable state and Federal permits as discussed above, minor to negligible short-term direct impacts to surface water quantity and quality would be anticipated from Alternative A under normal operations. Uncontrolled runoff and sediment transport generated by unusual runoff conditions, exceptional flow rates at disturbed channel crossing features (such as culverts or bank stabilization), or an accidental release of fuel, concrete, or other material into a stream should all be avoided through Project design and adherence to the applicable SCPs.

As described under Section 3.5, Affected Environment, numerous water wells and septic systems are located along the Alternative A. Implementation of EPMs would avoid the potential for significant adverse impacts to domestic water or sanitation systems. In addition, any rebuild contractor would be observed by a trained construction inspector to be sure that SCPs and EPMs are implemented. Other areas of relatively shallow recorded water levels occur immediately southeast of Lake Estes in the vicinity of the western Project terminus. These areas generally have deep soils and substrates that would not require blasting for excavation. Small, short-term declines of water in nearby wells could occur if dewatering were required for structure foundations. There may be no discernible effects, depending on excavation conditions, well proximity, and seasonal groundwater levels. If they occurred, these short-term local water level declines would be negligible or minor impacts. Groundwater level recovery would begin as soon as any necessary dewatering ceased.

Over the remainder of these alternatives, depths to groundwater are typically greater than 100 feet (and often much greater), well beyond excavation depths that could be required for structure construction. This also pertains to Variant A1. No springs are known to occur over the proposed ROW. Because of these factors, impacts from foundation excavation or access road disturbance that would result in a measurable reduction of groundwater flow to springs or wells are not likely to occur under normal operations or accident conditions.

If removal of groundwater is required during excavation, compliance with SCP 10 and CDPHE General Permit COG070000 (Construction Dewatering) would avoid or mitigate impacts from groundwater discharges. Spill controls would be implemented in accordance with SCP 4 and SCP 9 (see Section 2.5). Implementing these protocols would avoid impacts to groundwater quality, or reduce them to negligible or minor levels during construction and under normal operations or accident conditions. With the application of SCPs, and the practices implemented in compliance with permits to be approved by CDHPE, no significant adverse impacts to surface water or groundwater quantity or quality would result from Alternative A or Variant A1. Any adverse impacts would be negligible and short-term.

A floodplain (defined here as a SFHA Zone A or similar as delineated by FEMA) occurs near Alternative A near its western terminus. Variant A1 would avoid this locale. Based on close inspection of maps, the floodplain delineation is about 250 feet north of Mall Road. It is associated with low-lying topography along the Big Thompson River. Alternative A would closely follow Mall Road in the vicinity, and is likely to entirely avoid the delineated floodplain. In any case, no measurable effects on the water surface elevations of floods would occur from structure installations if they were to occur in the floodplain. The structures and foundations would present a comparatively negligible cross-section with respect to flood conveyance in the area. However, staging areas for equipment, vehicles, fuel, concrete, and other materials have not been defined for the Project. As stated in Section 2.3.4, staging areas would be located by the contractor according to Western's SCPs and would not occur on USFS land. SCP 7 addresses the location of staging areas with respect to vegetation conditions. In contrast, FEMA floodplain delineations are based on the estimated or calculated extent of inundation from a 100-year, 24-hour flood event. Furthermore, Western typically avoids the use of floodplain areas as set forth in its construction specifications. In addition, proposed staging areas go through a review and approval process by Western. Under these circumstances, impacts to floodplains would be avoided, or minimized to the extent that impacts would be far less than significant.

Because the Big Thompson River is a major water feature in the Project vicinity and supports a number of resource values, the presence of materials, equipment, or vehicles in its floodplain would present an unnecessary risk to water quality in shallow on-site groundwater and/or in the river downstream. If a flood, leak, or spill occurred while construction vehicles, equipment, or materials were located on the floodplain, significant adverse direct and indirect impacts to surface water quality could occur in the Big Thompson River from the release of fuels, concrete, or other contaminants. Given the relatively steep slope of the river in the vicinity, these effects could be transmitted well downstream, creating indirect effects on surface water quality and related designated beneficial uses. However, based on SCP 7, staging areas would not be sited in proximity to surface waters, minimizing the risk to water quality. As mentioned above, Western's construction specifications and review process would avoid or minimize floodplain impacts. By following the SCPs and EPMs (including compliance with applicable regulations), any adverse impacts to water quality from staging areas would be negligible and short-term.

Short-term adverse effects of Alternative A on water resources would include temporary, limited additional runoff and sedimentation in streams due to construction activities. These adverse impacts are not anticipated to be significant, and would be avoided or limited to negligible or minor intensity and extent by the implementation of Western's proposed SCPs, EPMs, and compliance with applicable state and Federal permits.

Long-term effects of Alternative A on surface water quantity or quality are not expected. No long-term effects on floodplains, groundwater quantity, or quality are expected.

4.5.5.2 Variant A2

Potential impacts under Variant A2 would be similar to those described for Alternative A, but would require excavating generally to a 9-foot depth, and occasionally to greater depths to accommodate vaults as discussed in Section 2.2.1.4. It is likely that Variant A2 would encounter groundwater in the valley topography along the western part of the alignment, where underground construction would take place. If groundwater were encountered that required discharge, Western would comply with CDPHE permit requirements for General Permit COG070000 - Construction Dewatering. The trench would be backfilled with native backfill approximately 5 feet thick over the concrete enclosing the transmission conduits. These procedures would avoid or mitigate the potential for degrading water quality during and after construction. Significant adverse effects on the movement of shallow groundwater would not be anticipated, due to the cover depth and relatively shallow nature of the concrete structure. Anticipated adverse impacts would be none to negligible and short-term.

Given the construction space available between the road and floodplain, Variant A2 would avoid excavation within the Big Thompson River floodplain; however, some equipment and materials would be required to be staged nearby during construction. By following SCPs, potential adverse impacts would be negligible, and if they occurred, would be short-term.

4.5.5.3 Alternative B

Direct and indirect effects to water resources under Alternative B would be generally the same as those described under Alternative A. In addition, Alternative B would cross one perennial waterbody (see **Table 3.5-2**). The SCPs, EPMs, and permit requirements discussed under Alternative A also would pertain to Alternative B, avoiding impacts or reducing them to well below significant levels. Potential impacts to surface water quantity and quality would be of the same types and nature as those described under Alternative A, but would differ in extent and location.

Alternative B would cross steep, rocky terrain along its western portion south of U.S. Highway 36 in the Meadowdale Ranch area. Potential impacts from construction traffic in this area would have greater potential for increasing runoff, erosion, and sedimentation than Alternative A. Alternative B would avoid the eastern shore of Pinewood Lake on the eastern end of the Project area. Alternative B would cross the Pinewood Lake area beyond the south end of the lake, but would be near several residences and associated domestic wells near the lake. Similarly, on the western end of the Project area, Alternative B would avoid areas of shallow groundwater immediately east of Lake Estes in Section 29, T5N, R72W. Under Alternative B, however, areas having domestic water wells with relatively shallow water levels (depths of 25 feet or less below the ground surface) occur in Sections 29 and 34, T5N, R72W. These are in the western portion of the alternative, with the wells in Section 34 located in the Ravencrest Heights/Ravencrest vicinity.

There are a number of homes along County Road 122 (West Pole Hill Road), Timber Lane, Pine Tree Drive, and Alpine Drive along Alternative B as it climbs from the highway to the ridgetop. Domestic wells and septic systems in this area, the northwest quarter of Section 34, T5N, R72W, may be adversely affected by foundation excavation. Adverse effects could be more likely if blasting were required to prepare structure foundations in nearby areas of hard, near-surface bedrock. If it were required, blasting could damage underground piping associated with domestic water supply and septic systems. Resulting impacts, which could range from negligible to significant, could involve reduced water levels in wells, damage to pumps or well casings, and cracked septic tanks or drainfield pipes. Implementation of EPMs (Section 2.5.2) would avoid or reduce these impacts to less than significant levels.

Under Alternative B, other potential impacts from foundation excavation and potential dewatering in areas of shallow groundwater would be the same as those described for Alternative A.

Alternative B would avoid the FEMA-designated floodplain along the Big Thompson River.

Short-term and long-term impacts under Alternative B generally would be the same as those described for Alternative A. Incorporating EPMs into Alternative B would avoid or reduce the potential for impacts to domestic water supply and septic systems if blasting were required for foundation excavation in the Ravencrest Heights/Ravencrest area.

4.5.5.4 Alternative C

Alternative C would cross steep, rocky terrain along its western portion north of U.S. Highway 36 in the Meadowdale Ranch area. Potential adverse impacts from construction traffic in this area would have greater potential for increasing runoff, erosion, and sedimentation than Alternative A, and would be similar to Alternative B. In addition, Alternative C would involve re-construction of the four-wheel drive section of West Pole Hill Road on National Forest System lands, which would increase the potential for impacts from runoff, erosion and sedimentation in that area. This potential would be addressed by Western's SCPs (particularly SCPs 3, 6, and 7) and other environmental practices in compliance with permits as needed. Adverse impacts would be avoided or reduced to moderate or less for both short-term and long-term durations.

Along the eastern portion of the study area, Alternative C follows the eastern side of Pinewood Lake. Based on water well records from the Colorado State Engineer, an area with potential for encountering groundwater during excavation exists in the vicinity of Pinewood Lake on the eastern end of the Project area. Several well records in that area indicate depths to water within 25 feet of the land surface in the south half of Section 30 and the north half of Section 31, T5N, R70W. These areas generally have deep soils and substrates that would not require blasting for excavation. Small, short-term declines of water in nearby wells could potentially occur if dewatering were required for structure foundations.

No discernible effects are anticipated from dewatering (if any is needed), depending on excavation conditions, well proximity, and seasonal groundwater levels. If they occurred, short-term local water level declines would be negligible or minor. Groundwater level recovery would begin as soon as any necessary dewatering ceased. As with Alternative A, if removal of groundwater is required during excavation, compliance with SCP 10 and CDPHE General Permit COG070000 (Construction Dewatering) would avoid or mitigate impacts from groundwater discharges. Spill controls would be implemented in accordance with SCP 4 and SCP 9 (see Section 2.5). Implementing these protocols would avoid adverse impacts to groundwater quality, or reduce them to negligible or minor short-term levels under normal operations or accident conditions.

Alternative C would avoid the FEMA-designated floodplain along the Big Thompson River. Incorporating the proposed EPMs would avoid or reduce the potential for impacts to domestic water supply and septic systems if blasting were required for foundation excavation in the Ravencrest Heights/Ravencrest area.

4.5.5.5 Variant C1

Potential impacts under Variant C1 would be similar to those described for Alternative C. If shallow groundwater was encountered along the valley portion of the underground installation, compliance with CDPHE permit requirements for General Permit COG070000 (Construction Dewatering) would avoid or mitigate the potential for degrading water quality during and after construction. The trench would be backfilled with native backfill approximately 5 feet thick over the concrete enclosing the transmission conduits. Significant adverse effects would not be anticipated on the movement of any shallow groundwater that may be present, due to the cover depth and relatively shallow nature of the concrete duct bank. Implementation of the SCPs would reduce adverse impacts under Variant C1 to minor or less intensity, and any that might occur would be short-term.

4.5.5.6 Alternative D

Potential adverse impacts to water resources and floodplains under Alternative D would essentially be of the same types as those described for Alternatives A and B but would differ in extent and location. In addition, at the western end of the Project area, the northern part of this alternative would cross the FEMA floodplain associated with the Big Thompson River. The southern part of Alternative D in the Ravencrest Heights/Ravencrest area, and also near the south end of Pinewood Reservoir, would have the same potential impacts on domestic water and septic infrastructure as Alternatives B and C if blasting were necessary. Incorporating the proposed EPMs would avoid or reduce the potential for impacts to domestic water supply and septic systems if blasting were required.

Alternative D would cross steep, rocky terrain along its western portion south of U.S. Highway 36 in the Meadowdale Ranch area. Potential adverse impacts from construction traffic in this area would have greater potential for increasing runoff, erosion, and sedimentation than Alternative A. Short-term and long-term impacts under Alternative D generally would be the same as those described for Alternative A. Alternative D has a potential for encountering groundwater during excavation in the vicinity of Pinewood Lake on the eastern end of the Project area. Several well records in that area indicate depths to water within 25 feet of the land surface in the south half of Section 30 and the north half of Section 31, T5N, R70W, near the eastern shore of Pinewood Lake. Poles for a wood pole H-frame structure would not be set nearly as deep as for a double-circuit monopole, so the potential for encountering groundwater would be reduced in that area. Furthermore, if groundwater were encountered in that vicinity during construction, potential impacts would be negligible to minor based on application of SCPs.

4.5.6 Mitigation

Due to the implementation of SCPs and EPMs (Section 2.5), no significant impacts to water resources would occur. No additional measures are recommended.

4.5.7 Residual Impacts

Direct and indirect adverse impacts to water resources could include short-term increases in runoff and sediment yield. These short-term direct or indirect impacts would be minor to negligible, and would be addressed by Western’s SCPs, and by coordination and compliance with environmental regulatory programs. Long-term adverse impacts to water resources would be negligible due to monitoring and maintenance of site stability, including permanent practices to control runoff, erosion, and sedimentation. After implementation of Western’s SCPs and EPMs, there would be no significant impacts to surface water, groundwater, or floodplains from any of the alternatives.

4.5.8 Irreversible and Irretrievable Commitments of Resources

Because there would be no permanent uses or impacts to any water resources, there would be no irreversible or irretrievable commitments of surface water or groundwater.

4.5.9 Relationship between Short-term and Long-term Productivity

Local short-term adverse impacts may occur if access road construction or traffic over existing ROWs increases runoff, erosion and sedimentation. Western's SCPs, proposed EPMs, Project monitoring, and compliance with state permits and Federal water quality regulations as needed would ensure the temporary nature of impacts to water resources if they occurred. Only short-term, minor or less adverse impacts to water resources and their productive beneficial uses are anticipated from any Project alternative.

4.6 Wetlands and Waters of the U.S.

The analysis area for wetlands, riparian areas, and waters of the U.S. includes a total width of 200 feet centered on the ROWs where an existing transmission line occurs in an alternative, and a total width of 300 feet centered on the ROWs for new routing options.

Issues related to wetland, riparian areas, and waters of the U.S. were identified during public scoping. Issues considered in assessing environmental impacts were further identified by Western through internal scoping and consultation with cooperating agencies. Issues include the loss or reduction of jurisdictional or isolated wetland/riparian acreages, or the decline of wetland/riparian community functionality (e.g., wildlife or aquatic habitats and water sources, water quality enhancement and sediment filtration, nutrient cycling, and flood attenuation). In waters of the U.S., losses or declines could result from the degradation of water quality or the destabilization of streambanks and channels as a result of construction and operation activities.

4.6.1 Methodology

The impact assessment for wetland and riparian areas, and waters of the U.S. from the Project is based on the identified locations of the resources in the ROW alternatives, as described in Chapter 3.0. The exact locations of transmission line structures, associated access roads, and associated temporary work areas are not yet identified, and additional field surveys and agency coordination for wetlands and waters of the U.S. would be undertaken for the APA. Other factors affect further quantification of potential resource impacts. For example, the Project Transportation Plan has been developed for National Forest System lands only and does not address access routes on private property. Also, access road placements are unknown on private properties, thus forcing a programmatic approach at this time. While estimates of disturbance from construction and operation of the Project are listed in **Table 2.3-5,** the locations of disturbance are not specifically known at this phase of the Project. Similarly, estimates of disturbance from access roads are summarized in **Table 2.3-6**, but their locations are not specifically known at this phase of the Project. As with other Project features, the need for new access roads and their locations would be determined when the final design and engineering are completed for the APA. Because of these considerations, the impact assessment for wetlands and waters of the U.S. is based on general resource conditions, known construction and maintenance activities, and the SCPs, EPMs, and applicable agency interactions that Western would implement.

Western's SCPs and EPMs have been taken into account in assessing the potential for impacts. These are listed in **Tables 2.5-1** and Section 2.5. Relevant SCPs for wetland, riparian areas, and waters of the U.S. include SCP 4, 5, 6, 7, 11, 21, 22, 32, and 33. Prior to the construction phase, wetland investigations would be performed on the entire selected alternative. EPMs for wetlands would clarify which unavoidable features are jurisdictional prior to construction, and would minimize adverse impacts to wetlands (including fens) on National Forest System lands. Consultation with the USACE as described in SCP 21 would determine mitigation for impacts to unavoidable jurisdictional wetlands. Implementation of SCPs and EPMs would avoid impacts or reduce their intensity and duration.

Based on the SCPs, structures and access roads would be located to avoid wetlands wherever practicable. If wetlands were crossed by access or spur roads, they would be crossed in an area where the least amount of damage would occur, and fen wetlands would be avoided. No structures or access roads would be located within wetlands on National Forest System lands. Staging areas would not be located in wetlands, including fen wetlands, riparian communities, or in proximity to surface waters. No disturbance of vegetation would occur within 100 feet of a stream, except for the removal of hazard trees. No fueling, staging, or storage areas would be placed within 100 feet of wetlands, stream, or riparian areas. Where practical new access ways would be located at least 100 feet from rivers, ponds, lakes, and reservoirs. Construction and operation activities are described in Chapter 2.0. Impacts to wetland, riparian areas, and waters of the U.S. associated with the Project are classified as either as short- or long-term.

4.6.2 Significance Criteria

It is Western policy to avoid all sensitive areas. A significant impact on wetland and riparian areas would result if any of the following were to occur from construction and operation of the Project:

- Degradation or loss of any federally protected wetland(s), as defined by Section 404 of the CWA.
- Direct loss of wetland or riparian areas, caused by removal of wetland vegetation or habitats, degradation of water quality, diversion of water sources, or erosion and sedimentation resulting from altered drainage patterns.

4.6.3 Impacts Common to All Alternatives

As stated in Chapter 2.0, Western would avoid construction and maintenance activities in wetlands wherever possible. Although wetlands are known to occur within the ROWs, Western can avoid direct impacts to them by designing around them and spanning them. If existing structures need to be removed in wetlands (or at locations surrounded by them), existing structures could be removed by walking in and cutting them off, and by removing them during the dry season, or when the ground is frozen, or by helicopter, at the construction contractor’s option. Based on the SCPs described in Section 2.5 and referred to in Section 4.6.1, new access roads would be located at least 100 feet from rivers, ponds, lakes, and reservoirs wherever practicable. Other locations could simply be avoided by spanning lines over them and working from adjacent dry sites. Because of approaches such as these, as well as the other standard practices and Project-specific measures described in Chapter 2.0, adverse effects on wetlands and waters of the U.S. are unlikely to occur. For example, the selected alternative ROW would minimize impacts to wetlands from roads and structures by avoiding inventoried wetlands to the extent practicable along the alignment, as well as by implementing EPMs and SCPs such as SCP 3, SCP 6, SCP 7, SCP 21, SCP 22, SCP 26, SCP 29, and SCP 49 (see Chapter 2.0, Section 2.5).

If wetlands could not be avoided, direct impacts could occur in small, isolated instances. Types of adverse impacts in those cases could include trampling or removal of vegetation and related habitat reduction. If construction activities were to take place through wetlands, additional types of impacts could include creation of deep ruts and soil compaction, and drainage alterations. Erosion; reduction of wetland water quality functions (e.g., sediment filtration); and habitat damage could occur in those cases. If impacts occurred to channels or stream banks, they could include damage or removal of riparian vegetation, new or further channel or bank instabilities, potential adverse effects on wildlife or aquatic habitat, reduced water quality, or a combination of these types of adverse effects. Additional discussion on erosion impacts on streams is in Sections 4.4 (Soils) and 4.5 (Water Resources). Similar possible indirect adverse impacts could occur further downstream.

Because of the potential for these types of impacts, Western would implement EPMs, and SCPs to avoid impacts or reduce them to less than significant levels. Coordination with the USACE and the USFS would be undertaken as needed, as described in the SCPs and EPMs in Section 2.5. On that basis, impacts to wetlands and waters of the U.S. would generally be none. Because of construction inspections, reclamation, and monitoring, if impacts did occur they would be negligible to minor and short-term in nature.

4.6.4 No Action Alternative

Field surveys for wetlands and waters of the U.S. have been conducted along the majority of this alternative, except for the reroute around the Newell Lake View subdivision. Proposed EPMs would be implemented to determine impacts and mitigation to wetland and riparian areas along the reroute around the Newell Lake View subdivision.

Drainage and wetland crossings located along the ROW for the No Action Alternative are listed in **Table 3.6-1**. Wetlands along the route are described in Section 3.6 and shown in **Figure 3.6-1a** through **Figure 3.6-1d**. Of the existing transmission line structures located within the Project area, three occur in wetlands. Two are located along the existing North Line and are sited in wetland meadows east of Estes Park. These meadows may be fens; they are pastures that are dry most of the year. Several options exist for timing and methods for any activities in these areas, as discussed above in “Impacts Common to All Alternatives.” An additional existing structure is located in a wet meadow along the South Line. The officially determined jurisdictional status of these areas would determine if further consultation with the USACE would be required. Western proposes to implement agency coordination as needed, and to avoid or minimize impacts according to the SCPs and EPMs. There would be no additional types of short-term disturbance under the No Action, and impacts would be none to minor. None to negligible long-term disturbance to wetlands or waters of the U.S. would be related to the ongoing maintenance of two transmission line ROWs.

4.6.5 Impacts Unique to Specific Alternatives

4.6.5.1 Alternatives A, B, C, D, and Variant A1

Drainage and wetland crossings located along the ROW for the Alternatives A, B, C, D, and Variant A1 are listed in **Table 3.6-1**. Wetlands along the route are described in Section 3.6 and shown in **Figures 3.6-1a** through **Figure 3.6-1d**. Of the existing transmission line structures located within the Project area, three occur in wetlands. Two are located along the existing North Line and are sited in wetland meadows east of Estes Park. These meadows are may be fens. They are pastures that are dry most of the year. Several options exist for the timing and methods used for any activities in these areas, as discussed above in “Impacts Common to All Alternatives.” Another existing structure is located in a wet meadow along the South Line. The method of removal of existing structures would be determined in consultation with the landowner. Existing structures would be removed during dry or frozen periods by being cut flush to the ground and left in place or hauled away in sections or by helicopter. Determination of new pole locations would be determined using the SCPs listed above, which would avoid wetlands to the extent practical. Adverse impacts would result from removal activities, but would be minimized if the poles are cut off flush to the ground, and left in place. Adverse impacts from construction and operation activities would only result if wetlands could not be avoided for structure placement. No structures or access roads would be located within wetlands on National Forest System lands and would be avoided to the extent practicable in other areas. Western’s SCPs and EPMs would be implemented, and the potential for impacts would be similar to those described above in Section 4.6.3, Impacts Common to All Alternatives.

4.6.5.2 Variants A2 and C1

Direct adverse impacts for Variants A2 and C1 would result from surface disturbance within wetlands associated with burying the transmission line. The National Wetland Inventory has designated wetland areas along the underground routes, but site-specific wetland and waters of the U.S. field surveys have not been conducted along these routes. If wetlands are located along the underground segments of the route, altered drainage patterns may develop as a result of trenching to bury transmission lines. Altered drainage or channel development would adversely affect wetlands, and could generate significant impacts like those described above in Section 4.6.3. Indirect adverse effects to any wetlands and riparian areas downslope of the route would include increased erosion, sedimentation, and the spread and establishment of noxious and invasive weed species. These would be significant indirect impacts. Western would implement SCPs and EPMs along these variants to avoid or minimize impacts; but depending on the location and extent of wetlands, the potential for significant impacts could be greater than for other alternatives.

4.6.6 Mitigation

Conformance with the SCPs and EPMs would avoid or reduce potential impacts to wetlands and waters of the U.S. Provisions for additional field inventories, and if necessary, further mitigation interactions with the USACE and USFS, would reduce impacts to less than significant levels. Because of this, no additional mitigation measures are recommended.

4.6.7 Residual Impacts

Residual impacts could include the loss of any wetlands or riparian areas due to unavoidable structure or access road placement, structure removal, and the loss of shrub and tree hydric vegetation in the ROW from construction and operation activities. Western has committed to avoiding wetland and riparian areas wherever possible to avoid impacts.

4.6.8 Irreversible and Irretrievable Commitments of Resources

If wetlands and riparian areas cannot be avoided and cannot be restored, irreversible commitments could include the permanent loss of wetland and riparian areas during construction and operation activities. Any permanent loss of wetlands would represent an irretrievable commitment of resources. Permanent losses would be minimized or mitigated by implementing EPMs and SCPs (see Chapter 2.0, Section 2.5).

4.6.9 Relationship between Short-term Use and Long-term Productivity

Western’s proposed wetland avoidance measures would preserve short-term use and long-term productivity. However, if wetlands and riparian areas cannot be avoided, impacts to wetlands and riparian areas could affect short-term use until EPMs and SCPs are fully implemented. Long-term productivity is not likely to be affected.

4.7 Vegetation

The analysis area for vegetation resources includes a width of 200 feet for existing transmission lines centered on the ROWs for each alternative, 300 feet for new routing options, and 75 feet for underground variants.

Issues selected for detailed analysis per Section 1.6.4 related to vegetation include effects on vegetation, including threatened and endangered, USFS sensitive, and management indicator plant species. Other issues brought up during the scoping period and those related to impacts to vegetation resources associated with construction and operation activities include: effects of construction activities on the spread and establishment of noxious and invasive weed species; habitat alteration; erosion, soil compaction and surface disturbance resulting in the loss or decline in native species or their associated habitat; impacts to areas with rehabilitation constraints; increased risk of wildfire occurrence and higher intensity; and visual impacts.

4.7.1 Methodology

Impacts to vegetation resources from the Project were identified based on the locations of the resources in relation to the proposed surface disturbance areas. The acres of disturbance associated with each alternative were estimated based on the anticipated extent of disturbance for construction and operation activities outlined in Chapter 2.0. Western has the flexibility to site structures and temporary work areas to minimize removal of vegetation within the Project ROW. Therefore, the exact structure sites for the transmission lines and locations of structures, access roads, and associated temporary work areas would be determined during the design phase of the Project. Because most exact locations of new surface disturbance-related activities are unknown for the proposed alternatives, the impacts to vegetation were estimated by multiplying the percent of the analysis area impacted by new surface disturbance-related activities by the acreage of each vegetation type within the analysis area. This method assumes that the likelihood of construction occurring in a particular vegetation type is based on its spatial prevalence in the ROW. Surface disturbance total acreages for each alternative are provided in **Table 2.3-5** for transmission line construction, and **Table 2.3-6** for short- and long-term surface disturbance for access roads. Calculations are based on the highest potential disturbance for each alternative. This impact assessment method is conservative and likely overestimates the acreage of vegetation communities that would be removed or altered by surface-disturbing activities by discounting the area that would not be disturbed through avoidance and the implementation of the special design features. It does provide the means to compare broad impacts and the number of acres of vegetation affected across the alternative alignments.

Western's SCPs and EPMs are taken into account in addressing the intensity of the impact. SCPs proposed are listed in **Table 2.5-1**. Relevant SCPs specifically for vegetation resources include SCPs 1-3, SCPs 5-7, SCP 16, SCP 21, SCPs 25-26, and SCP 37 (Section 2.5). Western's EPMs also are listed in Section 2.5. Additional vegetation management practices are discussed in **Appendix B**.

4.7.2 Significance Criteria

A significant impact on vegetation would result if any of the following were to occur from construction and operation of the Project:

- New noxious weed species introduced into the Project area, or existing species spread into areas that were previously dominated by native species.
- New or existing noxious weed species introduced that impact sensitive plants and/or plants protected under Federal or state law. Sections 3.8 and 4.8 discuss special status and sensitive plant species.

4.7.3 Impacts Common to All Alternatives

4.7.3.1 General Vegetation

Impacts of all alternatives would include surface-disturbance associated with construction and operation activities in the ROW and along access roads. Direct adverse surface disturbing impacts to vegetation would include the trampling/crushing of vegetation, the removal of vegetation, and soil compaction. Indirect effects to vegetation could include increased erosion, sedimentation, fugitive dust generation, the spread and establishment of noxious and invasive weed species, and habitat fragmentation. Construction related surface-disturbing activities would consist of establishing access, removing the existing structures, ROW clearing, and installation of transmission structures and lines. Estimated acreage of disturbance associated with operations includes the permanent footprint for the structures and permanent access roads. Construction ROW clearing would consist of removing trees and shrubs from the construction work area around each structure prior to construction. Vegetation clearing would be minimized in areas that are able to be spanned as described in SCPs 30 and 37. All areas where existing transmission lines would be decommissioned (all alternatives except for Alternative D) would be reclaimed and allowed to revegetate to a native vegetation community, or revegetated.

Methods for vegetation clearing and debris disposal are described in **Appendix B**. The slash piles and woody debris from clearing would be disposed of in a manner acceptable to the landowners or the land management agency. When clearing, construction crews would preserve native vegetation to the extent possible, particularly outside structure sites and near riparian areas. Most disturbances during this phase of construction would occur within the existing or expanded ROW. However, at some locations (e.g., at pulling and tensioning sites near an angle in the alignment) areas outside the ROW may be disturbed during construction.

After construction is complete, disturbed areas would be harrowed or disked to approximate pre-construction contours if compaction impacts are more detrimental than the damage remediation would cause. Ruts and scars that would interfere with overland travel would be filled or re-contoured. Excess soil would be spread evenly around the base of structures and revegetated or removed from the site. Disturbed areas would then be reseeded and mulched as needed, using a weed-free seed mixture as soon as practical. On National Forest System lands, an approved weed-free seed mixture would be used for restoration. The USFS would monitor reclamation success. In some areas, mulching, netting, or turf reinforcement mats may be necessary to protect seeded areas from erosion. If used, mulching would consist of weed-free hay or other approved material. Monitoring of percent cover would occur periodically on revegetated areas. Areas would be reseeded as necessary to establish cover.

Reclamation of the vegetation communities back to their native diversity and composition would depend on various factors such as soil mixing, timing and duration of disturbance, topography, slope, soil moisture, and precipitation. Although vegetation communities would recover at varying rates, it is estimated that overall, herbaceous-dominated plant communities would require a minimum of 3 to 5 years to establish adequate ground cover to prevent erosion and provide forage for wildlife species. Woody-dominated plant communities located outside the vegetation treatment areas or that are compatible with the transmission line based on topography (ravines and other low points), species type, and habitat quality, would require at least 10 to 25 years for shrubs to recolonize the area, while re-establishment of mature woodlands would require at least 30 to 50 or more years. In areas with steep slopes and increased risk of erosion, vegetation could take longer to re-establish. Impacts would be minor after reclamation is completed and vegetation re-established.

While fugitive dust mitigation would be addressed through the implementation of SCP 13 and SCP 16, vegetation in and adjacent to construction areas and access roads could be affected (e.g., reduction in growth rate) by any large accumulations of dust deposition that occurs. Therefore, deposition of fugitive dust would be a minor impact.

Any erosion occurring as a result of construction activities could impact native vegetation communities, sensitive species, and modify the floodplain surface as well as channel beds and banks. Erosion and sedimentation would be minimized through the implementation of SCP 3, SCP 6, SCP 7, SCP 26, SCP 29, and SCP 49 (see Section 2.5), and impacts are anticipated to be minor.

Access to the structures for construction and operations would consist of existing access roads, overland travel, and new access roads. Depending on topography, soil, vegetation condition, and slope, Western would utilize overland access where feasible. Within the areas of difficult access, additional permanent and temporary access roads may be required. Where new access routes would be required, Western would consult with the landowners and USFS and conduct cultural and biological surveys along the proposed access routes not previously surveyed. New access routes outside of the proposed ROW would require access agreements (on private lands) or USFS approval, as well as SHPO and USFWS concurrence after survey results have been submitted. For more detail on proposed access see Section 2.3.2.

Vegetation management activities that would be performed during construction and operations are described in Section 2.6.1 and **Appendix B**. Western proposes to change its vegetation management methods from a needs based approach to an integrated vegetation management approach based on the ANSI Tree, Shrub, and Other Woody Plant Maintenance-Standard Practices. Inspections of the transmission line infrastructure and surrounding vegetation would be conducted annually aerially, by vehicle, and by foot. On-site inspections would be conducted if aerial or ground inspections identify problems, and could require bucket trucks.

The type of vegetation management treatment implemented would depend on the previous vegetation management, the topography, the type of vegetation, the vegetation height, the quality of habitat conditions, and vegetation cover. Based on the combination of these conditions, Western identified six categories of existing conditions in the ROWs that would result in six different vegetation treatment methods (**Table 2.6-1**). Impacts were determined based on the most conservative vegetation treatment category for each vegetation community. Treatment methods range from none for low-growing compatible species to communities requiring treatment every 2 to 6 years due to fast-growing incompatible species such as lodgepole pine, and aspen. All but Category 1 would require initial treatment to clear incompatible vegetation from the ROW. For the purposes of this analysis, each of the vegetation communities identified in the analysis area was assigned to a vegetation treatment category. Several vegetation communities include areas and species that would fall in more than one vegetation treatment category, (e.g., a mixed conifer forest category could be composed of mature lodgepole pine [Category 2], immature lodgepole pine [Category 3], or spruce and fir species [Category 4]). Within the vegetation treatment areas assigned to treatment categories 2 to 6, vegetation management would maintain vegetation at lower heights and density than may occur naturally. When spanning between high points or over ravines, it is likely that most or all of the vegetation will remain undisturbed. Special design features described in Section 2.5.1.2 would seek to minimize visual impacts from vegetation management by exceptions to tree removal in special case scenarios as feasible and without increasing wildland fire risk.

Short-term adverse direct impacts to vegetation would include trampling of vegetation, the loss of herbaceous vegetation in areas disturbed during construction and subsequently reclaimed. The impacts of trampling would vary greatly based on the present vegetation, but will likely be short-term and minor where root stocks are not disturbed. Long-term adverse direct vegetation impacts would include loss of vegetation associated with the permanent facilities and access roads during the life of the Project, and the loss of woody vegetation in the ROW in vegetation treatment categories 2 through 6. Long-term direct vegetation impacts also would include the long-term re-establishment of a natural state of vegetation along one ROW should two ROWs be consolidated into one. These long-term impacts would occur for the life of the Project, and would be minor. No changes to genetic diversity or biodiversity are anticipated as a result of the Project.

4.7.3.2 Noxious Weeds

Following surface disturbance activities, noxious weeds and invasive species may readily colonize areas that lack or have minimal vegetation cover. It is anticipated that populations of weedy annual species (e.g., cheatgrass) may become established in localized areas for extended periods of time; however, Western would monitor the ROW and remove weed infestations as they are located. In addition, linear construction surface disturbance-related activities can result in increased introduction and/or spread of noxious weeds and invasive species within adjacent areas (Gelbard and Belnap 2003; Watkins et al. 2003). Noxious and invasive weed species compete with native plants, can degrade and modify native communities, and can reduce resources for native species (e.g., moisture, soil nutrients, and light). The establishment of weedy annual species can lead to buildup of fine fuels that ignite readily and are consumed rapidly.

Three listed noxious weed species are found in a total of 49 patches along drainage bottoms or edges, on wetland edges, and in disturbed areas near road edges. Disturbance in and around these areas could easily spread these species into previously undisturbed areas. The introduction of new noxious weed species into the Project area, or the spread of an existing weed species found in the Project area into areas that were previously dominated by native species would be a significant impact. The introduction of a new or existing noxious weed species would impact sensitive plants and/or plants protected under state law. The introduction or spread of noxious weeds would be both short-term and long-term adverse impacts, depending on the success of reclamation and effectiveness of noxious weed control methods. The potential for significant impacts from the introduction or spread of noxious weeds would be avoided, or reduced to negligible or minor levels, by the application of the SCPs and EPMs described in Section 2.5.

To minimize the spread or introduction of noxious weeds, all disturbed areas not returned to their original vegetation community would be reseeded to minimize erosion and the invasion of noxious weeds. Disturbed areas would be reseeded and mulched, as needed, using a weed-free mix as soon as practical after construction activities are completed in any given area. On National Forest System lands, a USFS-approved weed-free seed mix would be used for restoration.

The introduction of new noxious weed species, or the spread of an existing noxious weed species found in the Project vicinity into areas disturbed by Project construction or operation that were previously dominated by native species would be a significant impact. However, Western will utilize its Vegetation Management Program (**Appendix B**) to proactively minimize potential introduction of noxious weed species. This program includes periodic weed species surveys along the site, treatment of any noxious weeds found (by manual or chemical means) and re-seeding of any areas disturbed to minimize invasion of noxious weeds. Methods of herbicide application are further described in **Appendix B**.

4.7.3.3 Fuels and Fire Management

Fire regimes in vegetation communities modified by construction operations could be altered by surface disturbance activities. Cover type conversions, the removal or rearrangement of canopy and surface fuels, the temporary creation of localized areas devoid of vegetation or firebreaks, and spread of annual invasive species would result in altered FRCCs for vegetation communities within the ROW (see **Figures 3.7-2a** through **3.7-2d**). These alterations could result in changes in fire frequencies.

Vegetation falling into the Project would have the potential to ignite a wildfire due to the increased fuel loading associated with the current bark beetle epidemic. To manage for wildfire concerns, Western has actively managed the vegetation along the existing transmission lines through the removal of danger trees, and has responded to maintenance problems.

As described in Sections 4.7.4 and 4.7.5, Western would implement a proactive approach to manage vegetation communities within the ROW using the integrated vegetation management method to control vegetation growth and fuel conditions. The desired vegetation condition is defined by the lack of undesirable species. Undesirable species are species that present a safety hazard, are not suitable for the intended use of the ROW, or would typically threaten transmission line reliability, operations, or maintenance. The removal of fuels along the transmission line ROW through vegetation management would reduce the hazard of wildland fire. Fuel treatments are designed to place as much of the fuel as possible in direct contact with the ground to facilitate decay through increased moisture retention, potentially lessening the intensity of a fire situation over time while providing increased access for firefighters. The removal of hazardous trees and fuels in a linear fashion along the transmission line ROW would create a zone of disturbed fuels, minimizing the potential for wildland fire in the event of transmission line discharge or arcing. Indirectly, removal of hazard trees and fuel loads along the transmission lines may prevent transmission line damage from wildfire by moving the sources of heat and flame away from transmission lines and transmission line structures, thus preventing transmission failure. In addition, by removing hazardous trees near the transmission lines, trees would not fall on or otherwise contact the transmission lines, further reducing the potential to cause a wildfire and/or power outage. New modern steel transmission line structures would further reduce threats to and from wildfire, as the old wooden poles and hardware would be decommissioned.

Mechanical fuel reduction methods would be used to remove accumulations of vegetation debris from intensive or repetitive vegetation treatments. Fuel treatments such as mastication, chipping, or lopping and scattering would be used to reduce overhead hazards; however, these methods only change the arrangement of fuels, not the fuel load. Masticated or chipped fuels may have different ignition, burn, and spread characteristics compared to standing fuels, so this method could incrementally slow or prevent fire movement to the transmission line structures.

The density of remaining vegetation would be a consideration in assessing overall fire risk. Adequate access routes are required and must be maintained to provide for efficient, cost-effective vegetation treatment activities. In the short term, the removal of hazardous trees and fuels along the transmission line ROW would create a zone of modified fuels (little to no vegetation) that would reduce the likelihood of fire ignition in the event of transmission line discharge or arcing. In the long term, the modification of fuels in the transmission line ROW could influence landscape susceptibility to fire spread in areas of forest by breaking up continuous canopy fuels. The open ROW and access road system also would constitute a firebreak and allow for firefighting access, of considerable value in areas where any kind of access is limited. In non-forested ecosystems, the primary concern with vegetation in the ROW pertains to invasive species, which may alter the natural fire regime. The spread of invasive annual grasses over the long-term could increase fire frequency in areas not adapted to frequent fire; this would be considered a significant impact. Western's SCPs and EPMs (in Section 2.5) would reduce the potential for these impacts to less than significant levels.

4.7.4 No Action Alternative

The No Action Alternative, including the small segment involving the re-location of the line at the Newell Lake View subdivision, would pose short-term impacts similar to the other alternatives, except potential impacts would occur over a longer span of time. Long-term disturbance would be related to the acquisition of additional ROW, the new route around the Newell Lake View subdivision, additional maintenance activities, and the maintenance of two transmission line ROWs. Wildland fire risk could be increased relative to other alternatives or variants due to the aging wooden transmission lines within separate ROWs. About 147 acres of vegetation habitat would be affected by the No Action Alternative, but over a longer time span than what is proposed for the action alternatives. Vegetation management would be carried out as part of Western's Project. Western also would be required to abide by NERC reliability standards.

4.7.5 Impacts Unique to Specific Alternatives

4.7.5.1 Alternative A and Variant A1

The total disturbance for Alternative A and Variant A1 associated with the analysis area, ROW, construction and operations by each vegetation community are listed in **Table 4.7-1**. Impacts associated with construction activities would be greatest in the ponderosa pine woodlands, which would remove 79 acres of ponderosa pine woodlands. There are 8 acres of upland meadow/wetland mosaic that would be potentially impacted by construction activities. Impacts to wetlands and riparian areas are covered in Section 4.6, Wetlands and waters of the U.S.

Portions of Alternative A would require a wider ROW than the current existing ROW; however, much of this additional ROW would occur in the Upland Meadow and Upland Meadow/Wetland Mosaic which would not require vegetation treatment under Category 1.

Long-term disturbance with this alternative would be decreased from the No Action Alternative due to the consolidation of two transmission line ROWs into one transmission line ROW. The abandoned ROW would be allowed to revert to natural conditions, resulting in beneficial long-term impacts to vegetation resources.

Table 4.7-1 Acreage of Affected Vegetation under Alternative A and Variant A1

Vegetation Community	Analysis Area[1]	Right-of-Way[2]	Construction[3]	Operation[4]
Ponderosa pine woodland	324	139	75	7
Upland meadow/wetland mosaic	20	14	5	<1
Upland meadow	23	10	5	1
Mountain shrub mosaic	55	24	13	1
Mixed conifer forest	30	13	7	<1
Total Alternative A and Variant A1	**466**	**200**	**104**	**10**

[1] Analysis area includes a width of 200 feet for existing transmission lines centered on the ROWs for each alternative, 300 feet for new routing options, and 75 feet for underground variants.

[2] Includes a 110-foot width centered on the anticipated line. All of this area could be cleared of some vegetation during construction; a portion of the disturbance estimates during construction would occur within the ROW. Vegetation treatments would occur within this area during operation; the type and extent of treatment would depend on species composition, topography, species height, vegetation cover, previous vegetation management, and habitat quality.

[3] Includes disturbance associated with installation of aboveground structures, stringing sites, staging areas, removal of existing structures, and temporary and permanent access roads.

[4] Includes permanent structures and permanent access roads.

4.7.5.2 Variant A2

Impacts to vegetation resources including noxious weeds and fuels and fire management for Variant A2 are identical to Alternative A except within the westernmost segment where the route would be constructed underground following a new alignment (see **Figure 2.2-2**). Disturbance associated with construction activities along the underground portion of Variant A2 are listed in **Table 4.7-2**. Impacts for Variant A2 would result from surface disturbance associated with burying the transmission line. Trees and shrubs would be cleared within a distance of 25 feet on each side of the centerline where the route is buried underground. Herbaceous vegetation would be removed along and surrounding the sloped trench or trench boxes during construction. Herbaceous vegetation in the 25-foot buffer would be trampled by construction activities.

Direct surface disturbing impacts to vegetation would include the removal of vegetation, trampling/ crushing of vegetation in temporary work areas, erosion, and soil compaction. Indirect effects to vegetation would include increased erosion, sedimentation, fugitive dust generation, the spread and establishment of noxious and invasive weed species, and habitat fragmentation. Long-term beneficial impacts would include the revegetation of the abandoned ROW as it reverts to natural conditions.

Table 4.7-2 Acreage of Affected Vegetation under Variant A2

Vegetation Community	Analysis Area[1]	Right-of-Way[2]	Construction[3]	Operation[4]
Ponderosa pine woodland	239	136	82	18
Upland meadow/wetland mosaic	26	15	9	2
Upland meadow	29	16	10	2
Mountain shrub mosaic	47	27	16	4
Mixed conifer forest	16	9	5	1
Total Variant A2	**357**	**203**	**123**	**27**

[1] Analysis area includes a width of 200 feet for existing transmission lines centered on the ROWs for each alternative, 300 feet for new routing options, and 75 feet for underground variants.

[2] Includes a 110-foot width centered on the anticipated line. All of this area could be cleared of some vegetation during construction; a portion of the disturbance estimates during construction would occur within the ROW. Vegetation treatments would occur within this area during operation; the type and extent of treatment would depend on species composition, topography, species height, vegetation cover, previous vegetation management, and habitat quality.

[3] Includes disturbance associated with installation of aboveground structures, stringing sites, staging areas, removal of existing structures, and temporary and permanent access roads.

[4] Includes permanent structures, permanent access roads, and cleared area (25-foot buffer) above buried lines.

4.7.5.3 Alternative B

The total disturbance associated with the analysis area, ROW, construction, and operation by each vegetation community are listed in **Table 4.7-3**. Impacts associated with construction activities would be greatest in the ponderosa pine woodlands, which would remove 58 acres of ponderosa pine woodlands. There are 9 acres of upland meadow/wetland mosaic that would be potentially impacted by construction activities. Impacts to wetlands and riparian areas are covered in Section 4.6, Wetlands and Waters of the U.S.

The majority of the vegetation management activities on Alternative B would occur in the ponderosa pine woodland community. Initial treatment would be required for the ponderosa pine woodland, mountain shrub mosaic, and mixed conifer forest community, and every 5 years or more in the ponderosa pine woodland community. The occurrence of treatment in the mountain shrub mosaic community would be determined during annual inspections. The abandoned ROW would be allowed to revert to natural conditions, resulting in beneficial long-term impacts to vegetation resources.

Table 4.7-3 Acreage of Affected Vegetation under Alternative B

Vegetation Community	Analysis Area[1]	Right-of-Way[2]	Construction[3]	Operation[4]
Ponderosa pine woodland	195	116	57	7
Upland meadow/wetland mosaic	31	19	9	1
Upland meadow	20	18	9	1
Mountain shrub mosaic	50	30	15	2
Mixed conifer forest	64	38	19	2
Total Alternative B	**370**	**221**	**109**	**13**

[1] Analysis area includes a width of 200 feet for existing transmission lines centered on the ROWs for each alternative, 300 feet for new routing options, and 75 feet for underground variants.

[2] Includes a 110-foot width centered on the anticipated line. All of this area could be cleared of some vegetation during construction; a portion of the disturbance estimates during construction would occur within the ROW. Vegetation treatments would occur within this area during operation; the type and extent of treatment would depend on species composition, topography, species height, vegetation cover, previous vegetation management, and habitat quality.

[3] Includes disturbance associated with installation of aboveground structures, stringing sites, staging areas, removal of existing structures, and temporary and permanent access roads.

[4] Includes permanent structures and permanent access roads.

4.7.5.4 Alternative C

The total disturbance associated with the analysis area, ROW, construction and operation by each vegetation community are listed in **Table 4.7-4**. Impacts associated with construction activities would be greatest in the ponderosa pine woodlands, which would remove 72 acres of ponderosa pine woodlands. There are 11 acres of upland meadow/wetland mosaic that would be potentially impacted by construction activities. Impacts to wetlands and riparian areas are covered in Section 4.6, Wetlands and Waters of the U.S. A total of 265 acres of woodlands could be impacted by vegetation management activities in the ROW.

The majority of the vegetation management activities on Alternative C would occur in the ponderosa pine woodland community. Initial treatment would be required in the ponderosa pine woodland, mountain shrub mosaic, and mixed conifer forest communities. Over the life of the Project, vegetation treatment would occur every 2 to 6 years in the mixed conifer forest community, and every 5 years or more in the ponderosa pine woodland community. The occurrence of treatment in the mountain shrub mosaic community would be determined during annual inspections.

Portions of Alternative C would require additional ROW in addition to the current existing ROW; however, much of this additional ROW would occur in the upland meadow and upland meadow/wetland mosaic which would not require vegetation treatment under Category 1. The consolidation of two ROWs into one would result in the abandoned ROW reverting to natural conditions, resulting in beneficial long-term impacts to vegetation resources.

Table 4.7-4 Acreage of Affected Vegetation under Alternative C

Vegetation Community	Analysis Area[1]	Right-of-Way[2]	Construction[3]	Operation[4]
Alternative C				
Ponderosa pine woodland	263	130	67	6
Upland meadow/wetland mosaic	38	19	10	1
Upland meadow	22	11	6	1
Mountain shrub mosaic	62	31	16	1
Mixed conifer forest	33	16	8	1
Total Alternative C	**418**	**207**	**106**	**10**

1 Analysis area includes a width of 200 feet for existing transmission lines centered on the ROWs for each alternative, 300 feet for new routing options, and 75 feet for underground variants.

2 Includes a 110-foot width centered on the anticipated line. All of this area could be cleared of some vegetation during construction; a portion of the disturbance estimates during construction would occur within the ROW. Vegetation treatments would occur within this area during operation; the type and extent of treatment would depend on species composition, topography, species height, vegetation cover, previous vegetation management, and habitat quality.

3 Includes disturbance associated with installation of aboveground structures, stringing sites, staging areas, removal of existing structures, and temporary and permanent access roads.

4 Includes permanent structures and permanent access roads.

4.7.5.5 Variant C1

Variant C1 would be identical to Alternative C except for the westernmost segment from Mall Road to the USFS boundary adjacent to the Meadowdale Hills subdivision where the route would be constructed underground following a new alignment (see **Figure 2.2-2**). Impacts associated with construction activities along the underground portion of Variant C1 are listed in **Table 4.7-5**. Impacts for Alternative Variant C1 for would result from surface disturbance associated with burying the transmission line. Vegetation would be cleared a distance of 25 feet on each side of the centerline where the route is buried underground. Direct surface disturbing impacts to vegetation would include the removal of vegetation, trampling/crushing of vegetation in temporary work areas, erosion, and soil compaction. Indirect effects to vegetation would include increased erosion, sedimentation, fugitive dust generation, the spread and establishment of noxious and invasive weed species, and habitat fragmentation. Long-term beneficial impacts would include the revegetation of the abandoned ROW as it reverts to natural conditions.

Table 4.7-5 Acreage of Affected Vegetation under Variant C1

Vegetation Community	Analysis Area[1]	Right-of-Way[2]	Construction[3]	Operation[4]
Ponderosa pine woodland	241	134	83	6
Upland meadow/wetland mosaic	26	14	9	1
Upland meadow	29	16	10	1
Mountain shrub mosaic	48	26	16	1
Mixed conifer forest	16	9	5	<1
Total Variant C1	**360**	**200**	**124**	**9**

[1] Analysis area includes a width of 200 feet for existing transmission lines centered on the ROWs for each alternative, 300 feet for new routing options, and 75 feet for underground variants.

[2] Includes a 110-foot width centered on the anticipated line. All of this area could be cleared of some vegetation during construction; a portion of the disturbance estimates during construction would occur within the ROW. Vegetation treatments would occur within this area during operation; the type and extent of treatment would depend on species composition, topography, species height, vegetation cover, previous vegetation management, and habitat quality.

[3] Includes disturbance associated with installation of aboveground structures, stringing sites, staging areas, removal of existing structures, and temporary and permanent access roads.

[4] Includes permanent structures and permanent access roads.

4.7.5.6 Alternative D

Direct disturbance from construction and operation of Alternative D would be more than Alternatives A, B, and C because both the existing North and South lines would be rebuilt in-kind as single-circuit lines using structures very similar to those currently in use. Direct disturbance related to vegetation management would increase as the existing ROW would be expanded as needed and minor adjustments would made to the alignments where necessary for compliance with NERC requirements. The total acres associated with the analysis area, ROW, construction and operation by each vegetation community are listed in **Table 4.7-6**. The majority of the required access roads already exist for this alternative; however, areas of difficult access would require additional access roads.

The majority of the vegetation management activities on Alternative D would occur in the Ponderosa Pine Woodland community. Initial treatment would be required in the Ponderosa Pine Woodland, Mountain Shrub Mosaic, and Mixed Conifer Forest communities. Over the life of the Project, vegetation treatment would occur every 2 to 6 years in the Mixed Conifer Forest community, and every 5 years or more in the Ponderosa Pine Woodland community. The occurrence of treatment in the Mountain Shrub Mosaic community would be determined during annual inspections.

Portions of Alternative D would require additional ROW in addition to the current existing ROW; however, much of this additional ROW would occur in the Upland Meadow and Upland Meadow/Wetland Mosaic which would not require vegetation treatment under Category 1.

Table 4.7-6 Acreage of Affected Vegetation under Alternative D

Vegetation Community	Analysis Area[1]	Right-of-Way[2]	Construction[3]	Operation[4]
Ponderosa pine woodland	372	207	80	11
Upland meadow/wetland mosaic	80	45	17	2
Upland meadow	46	25	10	1
Mountain shrub mosaic	112	62	24	3
Mixed conifer forest	76	42	16	2
Total Alternative D	**686**	**381**	**147**	**21**

[1] Analysis area includes a width of 200 feet for existing transmission lines centered on the ROWs for each alternative, 300 feet for new routing options, and 75 feet for underground variants.

[2] Includes a 110-foot width centered on the anticipated line. All of this area could be cleared of some vegetation during construction; a portion of the disturbance estimates during construction would occur within the ROW. Vegetation treatments would occur within this area during operation; the type and extent of treatment would depend on species composition, topography, species height, vegetation cover, previous vegetation management, and habitat quality.

[3] Includes disturbance associated with installation of aboveground structures, stringing sites, staging areas, removal of existing structures, and temporary and permanent access roads.

[4] Includes permanent structures, permanent access roads, and vegetation management treatments.

4.7.6 Mitigation

No additional mitigation measures are recommended, due to the identification and anticipated implementation of SCPs and EPMs listed in Section 2.5.

4.7.7 Residual Impacts

Residual impacts would include the loss of vegetation related to the permanent placement of facilities and access roads for the life of the Project, any persistent noxious weeds and invasive species populations in the Project area, and fragmentation of native habitats. The number of acres of vegetation that would be affected by the alternatives is provided in **Tables 4.7-1** through **4.7-6**. Alternative D would affect the greatest number of acres for construction at 147 acres, versus 104 acres for Alternative A and Variant A1, 123 acres for Variant A2, 109 acres for Alternative B, 106 acres for Alternative C, 124 acres for Variant C1, and 147 acres for Alternative D. The direct or indirect loss of vegetation and fragmentation of native habitats is anticipated to be a minor impact, and residual impacts also are anticipated to be minor. The spread of new noxious weed species, or expansion of existing species into previously native habitats, if it occurred, would be a significant impact. Western's SCPs, EPMs, and post-construction monitoring and maintenance, would reduce the potential for impacts from noxious weeds. Long-term residual beneficial impacts under Alternatives A, A1, A2, B, C, and C1 would include the revegetation of an abandoned ROW as it reverts to natural conditions.

4.7.8 Irreversible and Irretrievable Commitments of Resources

For areas successfully reclaimed to original community type, no irretrievable commitments are anticipated. For plant communities dominated by shrubs and trees, the alteration of these communities caused by vegetation management activities would persist during the life of the Project.

Irreversible commitments would result if construction and operation activities caused impacts resulting in the permanent conversion of plant communities no longer dominated by native species. This could occur in locations where vegetation management for Category 1 areas is applied, reclamation is not successful, or fragmentation and noxious weed and invasive species permanently alter habitats.

4.7.9 Relationship between Short-term Uses and Long-term Productivity

Approximately 69 percent of the Project vicinity is Ponderosa pine and mixed conifer forest, 14 percent of the Project vicinity is a mountain shrub mosaic community. For all alternatives, Project-related impacts that may affect productivity include the disturbance of these communities, which may require as much as 10 to 50 plus years to recover after the life of the Project. Herbaceous communities, which comprise the rest of the Project vicinity, can take approximately 3 to 5 years to establish adequate ground cover. The longer it takes for the native vegetation community to re-establish increases the potential for populations of weedy annual species (e.g., halogeton, cheatgrass) to become established in localized areas for extended periods of time. The decrease in vegetation cover types either through direct impacts (i.e., removal of vegetation) or indirect impacts (i.e., the spread of noxious and invasive species) could impact ecological functions in and around the areas to be disturbed; however, these effects to vegetation use would diminish as EPMs and SCPs are fully implemented.

4.8 Special Status Plant Species

The analysis area for special status plant species includes a width of 200 feet for existing lines centered on the ROWs for each alternative, 300 feet for new lines, and 75 feet for the underground alternative.

Issues related to impacts to special status species associated with construction and operation activities include habitat alteration, erosion, soil compaction, and surface disturbance resulting in the loss or decline in native species or their associated habitat.

4.8.1 Methodology

Impacts to special status plant species from the Project are based on the locations of the resources in relation to the proposed surface disturbance areas. Proposed EMPs (Section 2.5) describe related inventories further. Species survey data were used to identify potential habitat and known locations of special status plant species in the study area. The analysis included a comparison of the number of acres of vegetation type for each alternative. SCPs were taken into account in addressing the severity of the impact. SCPs proposed to be implemented are listed in Section 2.5, SCPs. Relevant SCPs specifically for special status plant resources include SCPs 1, 4, 5, 21, and 22. Western has committed to avoid, where possible, sensitive resources such as wetlands and would normally avoid steep drainages, swales, and similar topographic features. These areas support habitat for the majority of species considered for analysis. Specific species are discussed under each alternative below.

Special status species impacts associated with the Project are classified as either short- or long-term. Short-term is defined as lasting no longer than the immediate 1- to 5-year implementation and restoration periods. Long-term is defined as lasting beyond the implementation period (beyond 5 years) or indefinitely. The construction of the transmission line is expected to take 8 to 12 months depending on the alternative.

4.8.2 Significance Criteria

A significant impact to special status plant species would result if any of the following were to occur from constructing and operating the Project:

- Loss of listed threatened and endangered plants, rare native plant communities, or other sensitive features identified by a state or Federal resource agency.
- Loss from any population of plants that would result in a species being listed or proposed for listing as threatened or endangered.

4.8.3 Impacts Common to All Alternatives

Direct impacts would occur from surface disturbance associated with construction and operations activities in the ROW. These activities include access and spur road construction, existing pole removal, installation of new structures, operation of staging areas and conductor stringing sites, ROW expansion, and reclamation of abandoned access and spur roads. Because the specific locations of structures have not yet been determined, potential impacts to special status plants species cannot yet be accurately assessed. Surface disturbance acreages associated with new access roads could occur anywhere in the proposed ROW. If impacts occur within specific sensitive species habitat, direct impacts could include trampling/ crushing of special status species individuals, the removal of native vegetation and special status species individuals, and soil compaction. Indirect effects to special status species would result in increased erosion, sedimentation, fugitive dust generation, the spread and establishment of noxious and invasive weed species, and habitat fragmentation. Operation acres include the permanent footprint for the new structures. These effects would be minimized with implementation of the SCPs mentioned above.

Construction ROW clearing would consist of removing trees and shrubs from the construction work area around each structure, prior to construction. The slash piles and woody debris from clearing would be disposed of in a manner acceptable to the landowners. Construction crews, when clearing, would preserve native vegetation to the extent possible, particularly outside structure sites and near riparian areas. Most disturbances during this phase of construction would occur within the existing or expanded ROW. However, at some locations (e.g., at pulling and tensioning sites near an angle in the alignment), areas outside the ROW may be disturbed during construction. Vegetation management activities to be performed during construction and operations are described in Section 2.6.1 and **Appendix B**. For the Project, Western proposes to change its vegetation management methods from a needs-based approach to an integrated vegetation management approach.

Through the implementation of SCP 21, structures would not be located in wetlands and sensitive habitats on all lands unless no practicable option is available. Implementing SCP 22 would avoid disturbance of vegetation within 100 feet of a stream, except for hazard trees. No fueling, staging, or storage areas would be placed within 100 feet of wetlands, stream, or riparian areas. Based on implementing EPMs and SCPs, adverse impacts resulting from the construction and operation activities would be unlikely in habitat for sensitive species.

Any potential impacts to special status plant species habitat, if occurring at all from Project activities, are likely to be adverse, but minor and short-term given that limited surface disturbance is anticipated and Western's commitment to avoid sensitive plant habitat where possible and reclaim disturbed areas. Long-term direct special status species impacts would include any long-term loss of habitat associated with the permanent facilities and access roads during the life of the Project, and the woody vegetation cleared as part of the vegetation management treatments. These negative impacts would be relatively minor for special status species habitat. The acres of vegetation that would be affected by the alternatives are provided in **Tables 4.7-1** through **4.7-6**. Introducing noxious weeds or expanding their occurrence would be both short-term and long-term adverse impacts to special status species. The extent of these effects would depend on the success of reclamation and noxious weed control. Section 2.5, Section 2.6, and **Appendix B** identify proposed measures and planning that would be conducted to avoid or minimize such impacts from noxious weeds, and to monitor the success of practices. When successful, these measures would limit the effects of noxious weeds on special status plant habitats to negligible levels.

4.8.3.1 Federal Threatened, Endangered, Proposed, and Candidate Species

Ute Ladies'-Tresses Orchid

Along the South Line, only one wet meadow at the south end of Pinewood Reservoir, exhibited the habitat characteristics for the Ute ladies'-tresses orchid. The habitat quality at this site is low as the vegetation cover was relatively dense. Individual species were not observed in this meadow within the

ROW during field surveys, although survey timing was early for the accepted survey time period for this species (late July through August). This wetland meadow has been spanned by the existing transmission lines. The application of SCPs 4 and 5, and the implementation of Project design criteria and relevant proposed EPMs in consultation with the USFS would avoid or minimize impacts to any occurrence of this species. Section 2.5 identifies Project design criteria and measures that would avoid significant impacts when successfully implemented. Successful implementation of these measures is required in order to avoid significant impacts as defined above by the Significance Criteria.

4.8.3.2 Additional Species of Concern

Potential habitat was observed for the additional species of concern including leathery grapefern, dwarf rattlesnake-plantain, lance-leafed grapefern, woody lily, Larimer aletes, spatulate moonwort, purple lady's slipper, pictureleaf wintergreen, rattlesnake ferns, and fern species. While fern *Cystoperis fragilis* populations are found in the analysis area, all other ferns are rare. It is anticipated that impacts would be minor based on the habitat requirements for the species and the absence of the fern species during surveys of the existing transmission lines. With the presence of potential habitat, though, adverse impacts could result from Project construction, vegetation maintenance activities and the removal or replacement of existing structures on the existing lines. In accordance with SCP 5, Project-specific design criteria, and proposed measures described in Section 2.5, any the occurrence of additional species of concern would be identified and addressed in coordination with USFS representatives during construction. Given the limited area to be disturbed in the lines, any potential impacts to suitable habitat present in the analysis area would not likely result in a loss of viability of the species population in the Project area, or cause a trend to Federal listing. Successful implementation of these measures would limit impacts to less than significant levels. Successful implementation of these measures is required in order to avoid significant impacts as defined above by the Significance Criteria.

4.8.4 No Action Alternative

4.8.4.1 Federal Threatened, Endangered, Proposed, and Candidate Species

<u>Ute Ladies'-Tresses Orchid</u>

The species would most likely not be impacted by maintenance requirements and structure replacement under the No Action Alternative.

4.8.4.2 Additional Species of Concern

The No Action Alternative, including the small segment involving the re-location of the line at the Newell Lake View subdivision, would pose impacts similar to the other alternatives, except potential impacts would occur over a longer span of time. Long-term disturbance would be related to the acquisition of additional ROW, additional maintenance activities, and the maintenance of two transmission line ROWs.

4.8.5 Impacts Unique to Specific Action Alternatives

4.8.5.1 Alternative A

<u>Additional Species of Concern</u>

Potential habitat was observed for the additional species of concern along Alternative A for leathery grapefern, wood lily, lance-leafed grapefern, Larimer aletes, spatulate moonwort, pictureleaf wintergreen, and ferns. The application of SCPs 4 and 5, and the successful implementation of Project-specific design criteria and relevant proposed EPMs in consultation with the USFS (Section 2.5) would avoid impacts to any occurrence of these species, or would limit impacts to less than significant levels.

4.8.5.2 Alternative B

Federal Threatened, Endangered, Proposed, and Candidate Species

Ute Ladies'-Tresses Orchid

Potential impacts to this species would be the same as discussed above in Section 4.8.3, Impacts Common to All Alternatives. The wetland meadow in the ROW has been spanned by the existing transmission lines and would most likely continue to be spanned and avoided under Alternative B. It would most likely not be impacted by the new vegetation maintenance requirements.

Additional Species of Concern

Potential habitat was observed for the additional species of concern along Alternative B for dwarf rattlesnake-plantain, lance-leafed grapefern, spatulate moonwort, purple lady's slipper, pictureleaf wintergreen, rattlesnake ferns, and fern species. The application of SCPs 4 and 5, and the successful implementation of Project-specific design criteria and relevant proposed EPMs in consultation with the USFS (Section 2.5) would avoid impacts to any occurrence of these species, or would limit impacts to less than significant levels.

4.8.5.3 Alternative C

Additional Species of Concern

Potential habitat was observed for the additional species of concern along Alternative C for dwarf rattlesnake-plantain, lance-leafed grapefern, woody lily, spatulate moonwort, purple lady's slipper, pictureleaf wintergreen, rattlesnake ferns, and fern species. The application of SCPs 4 and 5, and the successful implementation of Project-specific design criteria and relevant proposed EPMs in consultation with the USFS (Section 2.5) would avoid impacts to any occurrence of these species, or would limit impacts to less than significant levels.

4.8.5.4 Alternative D

Federal Threatened, Endangered, Proposed, and Candidate Species

Ute Ladies'-Tresses Orchid

Per SPC 21, structures would be carefully located to avoid sensitive vegetative conditions, including wetlands, where practical. On National Forest System lands, Western would avoid all wetlands. The wetland meadow along the South Line near Pinewood Reservoir has been spanned by the existing transmission line and would continue to be spanned and avoided under Alternative D. It would not be impacted by the new vegetation maintenance requirements since vegetation management activities are not planned within the meadow/mosaic complex.

Potential habitat was observed for the following USFS species: park milkvetch, triangle moonwort, paradox (peculiar) moonwort, plains rough fescue, Rocky Mountain cinquefoil, Rocky Mountain monkey flower, scarlet gilia, Selkirk violet, and yellow lady's slipper. Impacts to the habitat would continue to result from maintenance requirements and structure replacement on the existing lines. The application of SCPs 4 and 5, and the successful implementation of Project-specific design criteria and relevant proposed EPMs in consultation with the USFS (Section 2.5) would avoid impacts to any occurrence of these species, or would limit impacts to less than significant levels.

Park milkvetch habitat would be avoided during the transmission line rebuild activities. The two moonwort species (triangle moonwort and paradox [peculiar] moonwort) are found in early successional habitats which are found in the study area along previously disturbed areas. Construction and operation impacts would potentially create additional habitat for these species. The current areas of early successional habitat could be disturbed due to construction and access road development.

Habitat for the Rocky Mountain monkey flower, scarlet gilia, and Selkirk violet and yellow lady's slipper is found in forested areas in higher elevation areas and small, scattered aspen stands could be impacted by vegetation maintenance activities that require the removal of fast-growing woody species, and/or hazard trees. Based on the rock outcrops habitat characteristics for the Rocky Mountain cinquefoil species, it is unlikely that impacts from construction and operation activities would occur. It is assumed that equipment passage across rock outcrops would be minimal. Habitat for the Plains rough fescue occurs in open meadows and would be subject to impacts from structure removal and installation disturbances.

Implementation of SCPs 21 and 22, the implementation of EPMs, and the specific design criteria would minimize impacts to these species. If the potential habitats for any of the USFS sensitive species are disturbed, there could be adverse impacts to the habitat as described above in Section 4.8.3, Impacts Common to All Alternatives. Due to the limited area to be disturbed in the ROW, any potential impacts to suitable habitat present in the analysis area would not likely result in a loss of viability of the species population in the Project area, or cause a trend to Federal listing.

<u>Additional Species of Concern</u>

Potential habitat was observed for the additional species of concern along Alternative D for leathery grapefern, wood lily, dwarf rattlesnake-plantain, lance-leafed grapefern, Larimer aletes, spatulate moonwort, purple lady's slipper, pictureleaf wintergreen, rattlesnake ferns, and ferns species The application of SCPs 4 and 5, and the successful implementation of Project-specific design criteria and relevant proposed EPMs in consultation with the USFS (Section 2.5) would avoid impacts to any occurrence of these species, or would limit impacts to less than significant levels.

4.8.6 Mitigation

Based on implementation of SCPs, Project-specific design criteria, and proposed EPMs, no additional mitigation measures have been recommended.

4.8.7 Residual Impacts

Residual impacts could result from indirect impacts such as fragmentation of suitable habitats, and establishment of noxious weeds and invasive species into previously undisturbed areas as a result of permanent placement of facilities and access roads. Since the majority of the Project would use existing ROW and access, residual impacts would be minimal. However, implementation of the SCPs and EPMs described in Section 2.5 would minimize any potential impacts.

4.8.8 Irreversible and Irretrievable Commitments of Resources

For native plant habitats that are successfully reclaimed, no irretrievable commitments of resources are anticipated. For woody dominated plant communities, the alteration of these communities from vegetation management activities would persist during the life of the Project, resulting in an irretrievable loss of these resources for the life of the transmission line.

Irreversible commitments would result from construction and operation impacts that result in the permanent conversion of plant communities. This may occur in areas where vegetation management for Category 1 areas is applied, reclamation is not successful, or fragmentation and noxious weed and invasive species permanently alter habitats. If successful reclamation is not achieved, disturbed areas would no longer support native vegetation which could affect sensitive species habitat and associated pollinators.

4.8.9 Relationship between Short-term Uses and Long-term Productivity

For all alternatives, Project-related impacts that may affect long-term productivity of special status plant species involve the introduction or expansion of weedy annual species or other effects of disturbance. A decrease in vegetation cover types either through direct impacts (i.e., removal of vegetation) or indirect impacts (i.e., the spread of noxious and invasive species) could impact ecological functions that support special status plant species and associated pollinators. If the Noxious Weed Program, the Vegetation Management Plan, and other measures are successful, then the long-term productivity of special status plant species would be minimally affected. Combining the two ROWs will cause the abandonment of one entire ROW. The abandoned ROW would be reclaimed and seeded, and in the long term, natural vegetation would re-establish within the ROW. In addition to the adverse effects to vegetation, the abandonment and co-location of the one ROW would have positive benefits overall as the abandoned ROW returns to a natural state.

4.9 Wildlife

The analysis area for wildlife resources includes a width of 200 feet for existing transmission lines centered on the ROWs for each alternative, 300 feet for new routing options, and 75 feet for the underground variants.

Wildlife and fisheries issues identified for analysis from Section 1.6.4.2 include possible effects on threatened and endangered species, USFS sensitive species, and management indicator species. Other issues considered in assessing the environmental consequences of the Project on terrestrial and avian wildlife were identified by Western through internal scoping, consultation with the cooperating agency, and through comments provided during public scoping. The issues are summarized in the following paragraphs.

Issues related to wildlife from constructing and operating the proposed transmission lines include:

- Declining populations or local extinctions of wildlife populations from loss of habitat.
- Declining populations or local extinctions of migratory and resident bird species from the loss of habitat.
- Habitat fragmentation causing displacement of wildlife.
- Vehicle and equipment operation causing loss of eggs, nests, or young.
- Loss of economic or recreational opportunities caused by impacts to habitat and associated wildlife.
- Electrocution or collision of birds with transmission lines.
- Mortality of individuals resulting from collision with construction equipment or maintenance vehicles.

The Big Thompson River, North Fork Little Thompson River, Pinewood Reservoir, Flatiron Reservoir, and Lake Estes are the only perennial waterbodies that support fisheries near or in the analysis area, but they would not be affected by the Project alternatives. Because of this, subsequent potential impact discussions for aquatic species and habitats do not include fisheries.

4.9.1 Methodology

The analysis for wildlife assumes that the USFS will continue to manage fish and wildlife habitats on National Forest System land in coordination with the CPW and relevant regulations pertaining to wildlife.

Impacts to biological resources from the Project were determined based on the locations of the resources in relation to the proposed surface disturbance areas, and the number of acres of wildlife habitat affected. The acres of disturbed areas were estimated based on the extent of disturbance for construction and operation activities.

Impact analysis focused on wildlife species and habitats that could be affected by construction and operation of the Project. This process considered compliance with Federal laws and state statutes.

Methods for establishing a baseline of status, occurrence, and associated habitat of wildlife that may occur within the analysis area include reviewing published literature, unpublished agency reports and data, CNHP database search, CPW NDIS mapping system, and field surveys. Biologists with the CPW, USFWS, and USFS were contacted for information about the status of wildlife species, habitat, special wildlife features and habitats in the analysis area. Field studies were conducted in portions of the analysis area to document and evaluate wildlife and habitat that may occur within the analysis area. Further studies would be conducted after the preferred alternative is selected.

Impacts to wildlife resources from the Project are based on the locations of the resources in relation to the proposed surface disturbance areas. EPMs and SCPs are taken into account in addressing the severity of the impact. SCPs to be implemented are listed in **Table 2.5-1**, and EPMs are described in Section 2.5. The acres of disturbance associated with each alternative were estimated based on the process described in Section 4.7.1, Vegetation Methodology.

4.9.2 Significance Criteria

Impacts to wildlife would occur when habitats or individuals are disturbed or lost during the Project's construction or operation. Significance of the impact depends, in part, on the sensitivity of the population. A significant impact on wildlife would result if any of the following were to occur from constructing and operating the Project:

- Loss of individuals from a wildlife population or loss of habitat that would result in the species being listed or proposed for listing as threatened or endangered.
- Critical ranges (i.e., severe winter ranges, winter concentration areas, production areas, migration corridors, breeding sites) were adversely affected during season of use.

4.9.3 Impacts Common to All Alternatives

Direct and indirect impacts to wildlife species and their habitats would occur from surface disturbance associated with construction and operations activities in the ROW. These activities would include establishing access, removing existing structures, installing new structures, establishing staging areas and conductor stringing sites, ROW expansion or abandonment, access and spur road construction, and reclaiming abandoned access roads. Specific locations of structures or access roads have not been finalized; therefore potential impacts to wildlife species may occur anywhere within or adjacent to the selected ROW. In addition, impacts from access road construction may be reduced relative to impacts described in this document. Where construction by trenching is required, the types of impacts would be similar, although disturbance would occur across the entire ROW. Surface disturbance acreages associated with new access roads could occur anywhere in or near the proposed ROW.

Direct impacts could include trampling/crushing of wildlife individuals and the removal of native vegetation that provides habitat. Indirect effects to wildlife species and their habitats would include increased erosion, sedimentation, fugitive dust generation, the spread and establishment of noxious and invasive weed species, disturbance from human presence during construction and maintenance activities, noise, and habitat fragmentation. Adverse effects from noise associated with construction, are anticipated to be minor and short-term, ending when construction terminates.

Short-term adverse effects could result from construction-related surface-disturbing activities potentially impacting wildlife species, such as removing the existing structures, ROW clearing, and installation of transmission line structures and conductors. The Project access road network, which would be constructed or upgraded to fulfill the construction requirements of the Project, would impact wildlife species to varying degrees depending on the geographical location and type of habitat disturbed. There are seven general impacts to wildlife and wildlife habitat including: 1) increased mortality from road construction; 2) increased mortality from collisions with vehicles; 3) modification of wildlife behavior; 4) alteration of the physical environment; 5) alteration of the chemical environment; 6) spread of invasive and exotic species; and 7) increased alteration and use of habitats by humans (Trombulak and Fissell 2000). Not all species and ecosystems are equally impacted by roads, but overall the presence of roads is highly correlated with changes in species composition, population sizes, and hydrologic and geomorphic processes that shape aquatic and riparian habitats (Trombulak and Fissell 2000).

Operation impacts would include the minor loss of existing habitats in areas for the permanent footprint for the new structures. Long-term effects to wildlife species due to impacts from operations would be similar to short-term effects due to construction; however, they would be less intensive and longer in duration. During operation of the Project, a portion of habitat disturbed during construction would not be reclaimed until after the end of the Project's design life. Any potential impacts to wildlife species habitat from Project activities, would be minor given that limited surface disturbance is anticipated and Western's commitment to reclaim disturbed areas, with the exception of where permanent facilities would be constructed. No changes to genetic diversity are anticipated as a result of the Project.

Long-term direct wildlife species impacts would include any long-term loss of habitat associated with the placement of new permanent facilities and access roads during the life of the Project, and loss of woody vegetation habitat removed or restricted from the ROW for the life of the Project. However, the impacts to wildlife species resulting from the long-term loss of habitat would be reduced through the utilization of existing transmission ROWs and access roads and the abandonment of one ROW under all alternatives with the exception of the No Action Alternative and Alternative D. Although the removal or restriction of woody vegetation within the ROW would be an adverse impact to some avian and terrestrial wildlife species through the loss of potential breeding, nesting, and foraging habitat, some wildlife species have been shown to benefit from the increase in edge habitats (Temple and Flaspohler 1998). Abiotic and biotic conditions located along forest edge habitat differ from those found in the interior of a forest. Forest edges are exposed to increased light which often results in increased shrub species diversity and density (Harper et al. 2005). This increase in the diversity of shrub species and complexity of vegetation structure along forest edges has been shown to provide greater cover and available forage for various wildlife species (Helle and Mouna 1985; Johnson et al. 1979; Yahner 1988). Quantification of these impacts is not presented in this analysis due to the lack of available data and the variability of wildlife populations. Any impacts resulting from woody vegetation removal or restrictions within the ROW would be minor, and would be long-term considering that maintenance activities would occur for the life of the Project.

There are benefits of consolidating two separate lines into one ROW, and letting the abandoned ROW revert to natural conditions as planned under all alternatives with the exceptions of the No Action Alternative and Alternative D. As described above, long-term direct impacts also would include the long-term re-establishment of a natural state of vegetation considered associated wildlife habitat along one of the existing ROWs. Maintenance and operation activities associated with noise and human disturbance also would be reduced when limited to one ROW instead of two. In addition, there may be a reduction in trails that could be utilized by off-roaders as well. This impact from the Project could be somewhat reduced if a combined alternative is selected.

4.9.4 No Action Alternative

The No Action Alternative, including the small segment involving the relocation of the line at the Newell Lake View subdivision, would pose impacts similar to the other alternatives, except potential impacts would occur over a longer span of time and impact a larger area. Maintenance requirements and activities on the existing lines would likely increase at various locations of the line more often than with the other alternatives that include the consolidation of two ROWs into one. In addition to on-going maintenance activities, including as-needed structure replacement, the No Action Alternative would involve the acquisition of additional ROW and access roads at locations where the current ROW is insufficient to maintain appropriate vegetation clearances and compliance with applicable reliability standards.

Direct and indirect impacts to wildlife species would include those described for action alternatives in preceding Section 4.9.3 and in Section 4.9.5 below. Short-term and long-term effects under the No Action Alternative would be similar to current levels; however, both general maintenance activities and corresponding impacts to wildlife would increase with time.

4.9.5 Impacts Unique to Specific Action Alternatives

The types of direct and indirect impacts to wildlife species resulting from action alternatives would be the same as those discussed in Section 4.9.3. Additional impacts to wildlife are described in the following sections.

4.9.5.1 Alternatives A, B, C, D, and Variant A1

Big Game

Alternatives A, B, C, or D, or Variant A1 would result in potential direct impacts to big game species (i.e., mule deer, moose, and Rocky Mountain elk), including the minor incremental reduction of potential forage and the potential incremental increase of noxious and invasive weeds and habitat fragmentation from vegetation removal. These impacts would be more pronounced within big game winter ranges. For the general, comparative extents of where these impacts would occur, **Table 4.9-1** includes acres of elk summer range, elk parturition range, elk winter range, elk severe winter range, mule deer summer range, mule deer winter range, severe winter range, and moose winter range that would be impacted under each of these routes.

The primary potential direct impact would be temporary wildlife avoidance (displacement) from otherwise suitable habitat in the vicinity of the Project. Construction of these alternatives would temporarily result in increased human activity and noise in the vicinity of the transmission line. The most common wildlife responses to noise and human activity are avoidance or accommodation. Avoidance would result in displacement of animals from an area larger than the actual disturbance area. Following temporary avoidance of human activity and noise-producing areas during short-term construction activities, wildlife species would return to areas that were formerly avoided.

Displacement of big game species as a result of direct habitat loss and indirect reduction in habitat quality has been widely documented (Irwin and Peek 1983; Lyon 1983, 1979; Rost and Bailey 1979). Studies have shown that big game species tend to temporarily move away from areas of human activity and roads; thereby reducing habitat utilization near disturbance areas (Cole et al. 1997; Sawyer et al. 2006). In most instances, suitable habitat adjacent to disturbed areas would be available for use by big game species. However, displacement would increase competition and could result in local reductions in wildlife populations, if adjacent habitats are at carrying capacity.

Adverse indirect impacts to big game species resulting from Project construction and operation are anticipated to be minor to negligible under these alternatives. In addition to avoidance responses discussed above, increased human activity as a result of adjusted access roads intensifies the potential for wildlife/human interactions ranging from harassment of big game species to higher levels of hunting or poaching. However, due to the presence of existing ROWs and roads within the Project area, effects to big game species as a result of these impacts would be reduced and incremental. Any adverse impacts to big game wintering habitat could potentially be offset by the beneficial impact of restoring one ROW to native conditions when consolidating the two ROWs into one under all alternatives with the exception of Alternative D, and the increased edge habitat created by the existing ROW vegetation management practice of thinning. Edge habitats typically provide increased foraging opportunities to big game.

Table 4.9-1 Direct and Indirect Impact Acreages to Big Game Habitats within the Project Analysis Area

Habitat Type[1]	Construction (Operation) Impact Area, acres						
	Alternative A	Variant A1	Variant A2	Alternative B	Alternative C	Variant C1	Alternative D and No Action
Elk Summer Range	17.8 (1.7)	14.9 (1.8)	16.0 (1.3)	14.9 (1.8)	15.2 (1.5)	18.7 (1.4)	9.4 (1.3)
Elk Parturition	14.7 (1.4)	11.1 (1.3)	13.5 (1.1)	8.1 (1.0)	10.3 (1.0)	14.0 (1.0)	14.8 (2.1)
Elk Winter Range	104.0 (10.1)	128.0 (15.2)	128.0 (1.8)	97.4 (11.7)	106.0 (10.1)	124.0 (9.1)	141.9 (20.4)
Elk Severe Winter Range	17.7 (1.7)	14.8 (1.8)	15.9 (1.3)	14.9 (1.8)	15.2 (1.5)	18.7 (1.4)	14.7 (2.1)
Mule Deer Summer Range	104.0 (10.1)	128.0 (15.2)	128.0 (1.8)	97.4 (11.7)	106.0 (10.1)	124.0 (9.1)	141.9 (20.4)
Mule Deer Winter Range	104.0 (10.1)	128.0 (15.2)	128.0 (1.8)	97.4 (11.7)	106.0 (10.1)	124.0 (9.1)	141.9 (20.4)
Mule Deer Severe Winter Range	8.6 (0.8)	9.7 (1.2)	10.1 (0.8)	9.9 (1.2)	10.7 (1.0)	13.4 (1.0)	7.1 (1.0)
Moose Winter Range	48.7 (4.7)	55.3 (6.6)	56.7 (1.8)	43.7 (5.3)	46.5 (4.4)	55.0 (4.0)	61.4 (8.8)

[1] Source: NDIS 2012.

In summary, adverse short-term and long-term impacts to big game species resulting from Project construction and operation of these alternatives are anticipated to be minor in significance due to the majority of each alternative being placed within existing ROWs. Short-term effects due to the construction of these aboveground alternatives would result in the incremental loss of big game habitat, of which a portion would immediately be reclaimed following construction. With the exception of Alternative D, overall impacts to big game species are considered beneficial based on the plan to consolidate two ROWs into one, allowing one to return to native conditions. Recovery times of the various vegetation communities that provide habitat for the species within the Wildlife Analysis Area are discussed in Section 3.7, Vegetation.

Long-term impacts to big game species from surface disturbance activities would include the loss and conversion of habitat where the existing ROW was expanded or rerouted. Habitat loss would result in the displacement of more mobile big game species into adjacent habitats. Surface disturbance also would result in an incremental increase in habitat fragmentation along small portions of the Project off the existing ROWs. However, long-term beneficial impacts would include the revegetation of the abandoned ROW as it reverts to natural conditions under all alternatives with the exception of Alternative D. Additionally, the small amount of habitat conversion from canopied forest to more open edge type habitats is likely to be beneficial to big game species as these areas typically provide increased foraging opportunity.

<u>Other Mammals</u>

Based on known ranges and habitat preferences, a variety of small game, mammalian predators, and small mammal species including bats, are likely to be present in the analysis area. Most of these species are relatively widespread and common. There are no identified permanent issues regarding potential effects of the Project on these species.

Direct impacts to other mammals as a result of these aboveground alternatives would be similar to those described for big game mammals. Acres of habitat affected under Alternatives A, B, C, and D and Variant A1 are included in **Tables 4.7-1, 4.7-3, 4.7-4,** and **4.7-6**. Construction of these alternatives would result in direct impacts to other mammals, and would include the incremental loss of potentially suitable habitat. Impacts from construction also would include temporary animal displacement from disturbed areas and increased habitat fragmentation along small portions of the Project off the existing ROWs, which would continue until reclamation was completed and vegetation re-established. However, long-term beneficial impacts would include the revegetation of the abandoned ROW as it reverts to natural conditions under all alternatives with the exception of Alternative D. Potential impacts also could include nest and burrow abandonment or loss of young. These temporary losses would reduce productivity for that breeding season.

Indirect impacts to these species include mortality due to access as a result of the use of existing and new and improved roads (Holbrook and Vaughan 1985). Construction traffic may injure or kill individuals, and local populations may experience higher levels of hunting and poaching pressure, due to improved access from additional access roads (Holbrook and Vaughan 1985). However, due to the presence of existing ROWs and roads within the Project area, effects as a result of these impacts would be reduced and incremental. Alternatives A and D would result in improved access below The Notch, but access would be limited since the access would begin on private land without public access. Alternative C would result in improved access to areas along West Pole Hill Road above Meadowdale Hills subdivision, which would increase human access on National Forest System land near The Notch. Alternative B would not result in improved access to the Project area. In most instances, suitable habitat adjacent to disturbance areas would be available for use by these species. Also, by consolidating the two ROWs into one under all alternatives, with the exception of D, road use and traffic levels would be reduced. Therefore, impacts from the Project would be anticipated to be minor.

Short-term and long-term impacts to other mammal species would result from the incremental loss or alteration of habitat and impacts associated with human activity and noise, and could result in displacement of these species into adjacent habitats. These impacts are anticipated to be minor due to the location of the Project area within existing ROWs and the availability of these habitats adjacent to the Project area.

The road network may impact other mammal species to varying degrees depending on the geographical location, type of habitat disturbed, and wildlife species potentially impacted. Impacts to other mammal species from the construction and maintenance of construction and access roads would be similar to direct and indirect impacts from power line construction. Long-term effects to other mammal species due to impacts from operations are similar to short-term effects due to construction; however, they would be less intensive and longer in duration. These impacts generally would be minor, especially since many of the roads and most of the ROWs currently exist.

Upland Game Birds

Impacts to upland game birds as a result of Alternatives A, B, C, and D or Variant A1 would be similar to those discussed above under the heading “Other Mammals.” Acres of habitat affected under these alternatives are included in **Tables 4.7-1, 4.7-3, 4.7-4,** and **4.7-6**. In addition, a portion of the Project is located in wild turkey overall range (NDIS 2012) and a portion (structure numbers 7-4 to 9-4, North Line, and 7-5 to 9-6, South Line) of the analysis area is within a wild turkey production area (NDIS 2012). Construction of the Project would result in direct impacts to upland game birds through the incremental loss of potentially suitable habitat, and displacement from the disturbance areas, which would continue until construction and reclamation was completed and vegetation re-established. Potential impacts also could include nest abandonment or loss of eggs or young. These temporary losses would reduce productivity for that breeding season, given the linear nature of the Project and duration of construction activities in a specific area.

Short-term and long-term impacts to upland game birds generally would be minor or negligible. Short-term effects due to construction of these aboveground alternatives would result in the incremental loss or alteration of upland game bird habitat. Habitat loss or alteration would result in the displacement of species into adjacent habitats. Surface disturbance also would result in an incremental increase in habitat fragmentation along the Project off the existing ROWs, which would continue until reclamation was completed and vegetation re-established. However, long-term beneficial impacts would include the revegetation of the abandoned ROW as it reverts to natural conditions under all alternatives with the exception of Alternative D. Potential impacts also could include nest abandonment or loss of young. These temporary losses would reduce productivity for that breeding season. Construction within the wild turkey in these parts of production areas during the period of March 15 to August 15 could potentially disrupt nesting birds, and impacts to wild turkey in these parts of production areas could be moderate during this period. However, implementation of Project specific design criteria (Section 2.5.2.1), including pre-construction surveys, would alleviate this potential impact.

Long-term impacts from operations to upland game birds would be similar to the short-term disturbance effects due to construction; however, impacts would be less intensive due to the infrequent nature of helicopter flyovers and maintenance visits to structure sites.

Raptors

Special status raptor species are addressed in Section 4.10, Special Status Wildlife Species. Potential direct impacts to raptors from the construction and operation of Alternatives A, B, C, and D and Variant A1 are included in **Tables 4.7-1 , 4.7-3, 4.7-4,** and **4.7-6**, and would include the incremental loss or alteration of potentially suitable breeding, roosting, and foraging habitat, and could include reduction in prey base and increased human disturbance. Impacts would be greater if activities occur during the breeding season. The loss of native habitat to human development has resulted in declines of hawks and eagles throughout the West (Boeker and Ray 1971; Schmutz 1984). In some cases, habitat changes have not reduced numbers of raptors, but have resulted in shifts in species composition (Harlow and Bloom 1987). Impacts to small mammal populations due to habitat loss can result in a reduced prey base for raptors, causing lower raptor densities. Thompson et al. (1982) and Woffinden and Murphy (1989) found that golden eagles and ferruginous hawks had reduced nesting success where native vegetation had been lost and the habitat was unable to support jackrabbit (prey) populations. Furthermore, raptors have a high potential of being disturbed from nests and roosts, which contributes to displacement and reduced nesting success (Holmes et al. 1993; Postovit and Postovit 1987; Stalmaster and Newman 1978).

If construction of these aboveground alternatives was to occur during the raptor breeding season, impacts to breeding raptors could include the possible loss of nests or nest abandonment due to increased noise and human activity in proximity to an active nest site. If this occurred, it would result in a significant impact. However, if Project construction was to occur during the raptor breeding season, a migratory bird nesting survey would be conducted prior to any construction activities in order to avoid potential impacts to active nests as described in Section 2.5 under Project Specific Design Criteria.

The primary short-term impact to raptors would be due to the incremental loss of foraging, breeding, and nesting habitat due to construction activities. However, these short-term impacts would be minor. The primary potential long-term effects to raptors from Project operation would be mortalities as a result of collision with transmission line components. Maintenance activities (vegetation management, ground or air inspections, and repair work) would cause indirect impacts, but would be less intense and shorter in duration than long-term impacts. Transmission lines do not pose an electrocution hazard for bird species because the conductor spacing is too wide to allow contact. Configurations over 69 kV typically do not present a high electrocution potential, based on conductor placement and orientation (APLIC 2006). The proposed structure types for all action alternatives would be conformant with APLIC (APLIC 2012) and utilize larger span widths between charged components than those of the existing towers. Therefore the electrocution potential for all alternatives, Alternative D excluded, would be reduced relative to the existing tower configuration. Electrocution potential for Alternative D would remain, and is the same as that of the existing transmission line.

Avian predators, particularly raptors and corvids (crows, ravens, magpies, and jays), are attracted to overhead utility lines because they provide perches for various activities, including hunting in treeless landscapes (APLIC 2006; Knight and Kawashima 1993; Steenhof et al. 1993). Power poles increase a raptor's range of vision, allow for greater speed during attacks on prey, and serve as territorial markers (APLIC 2006; Manville 2005; Steenhof et al. 1993). Transmission line structures can impact small game, nongame, migratory bird, reptile, and amphibian populations by enhancing raptor and corvid populations. Raptors and corvids are not expected to occur at higher densities than the situation with the existing lines since, depending on the alternative, the number of nesting and perching locations would remain the same or be greatly reduced by the abandonment of one ROW.

Operation of the transmission lines also could incrementally increase the collision potential for migrating and foraging bird species. Collision potential typically is dependent on variables such as the location in relation to high use habitat areas (e.g., nesting, foraging, and roosting); line orientation to flight patterns and movement corridors; species composition; visibility; and line design (APLIC 2006). Avian mortality from collisions with power lines is well documented (Brown and Drewien 1995). Although rarely impacting healthy populations with good reproductive potential, collision mortality can be biologically significant to small local populations (Beer and Ogilvie 1972) and endangered species (APLIC 1994; Faanes 1987). Avian loss is often greatest where power lines cross migratory paths, bisect feeding and nesting-roosting sites, or occur adjacent to major avian use areas (Savereno et al. 1996). Higher risk also exists when land topography funnels birds through power line corridors (Bevanger 1990; Faanes 1987). Highest collision probabilities appear to occur where birds typically fly between foraging and loafing habitats bisected with overhead lines (Science Applications International Corporation 2001). Co-locating transmission lines into one ROW would reduce the potential for collisions.

Factors that influence the risk of collision to individual birds as they encounter power lines are varied and include species, flight characteristics, previous experience with power lines (typically a function of age), weather, topography, and power line structural characteristics (APLIC 2006, 1994; Thompson 1978). The static wire, also referred to as the shield or groundwire, has posed the greatest collision danger to birds (APLIC 1994; Faanes 1987). Research has indicated that most collisions occur with static wires when birds increased their altitude in apparent attempts to avoid conductor wires. In the absence of static wires most collisions could have been avoided. If power lines must be placed aboveground, the risk of colliding would probably be reduced if all wires were in a single horizontal plane and tower height was reduced to that of the trees, reducing above-canopy exposure (Bevanger 1994; Thompson 1978).

Project alternatives include the replacement of existing transmission structures with updated structures that conform to APLIC 2012 guidelines. This improvement would reduce the amount of available perching and nesting sites along the transmission line and reduce the potential for avian mortality associated with collision. Additionally, these alternatives, with the exception of Alternative D, would replace the wood pole H-frame structure with steel monopole structures, likely less suitable for nesting. Therefore, operation of the Project would result in negligible long-term impacts to raptors and could potentially be beneficial due to the fact that installation of new APLIC 2012 compliant tower structures would reduce the potential for avian mortality from collision.

Other Birds

Migratory bird species that could be impacted by construction activities include nesting passerines, or songbirds, that utilize the various habitats found within the analysis area for wildlife. Songbirds in the analysis area include open-country species associated with grassland and shrubland habitats and woodland species associated with coniferous forests.

Potential direct impacts resulting from construction and operation of the aboveground alternatives to migratory bird species would include the incremental loss of potentially suitable breeding, roosting, and foraging habitat, reduction in forage base, and avoidance due to increased human disturbance, especially during the breeding season. Acres of habitat affected under Alternatives A, B, C, and D and Variant A1 are included in **Tables 4.7-1, 4.7-3, 4.7-4,** and **4.7-6**. If construction occurred during the migratory bird breeding season (approximately March 1 to July 31), impacts to breeding birds could include the loss of nests or nest abandonment caused by increased noise and human activity in proximity to an active nest site. During this period, the Project could cause adverse impacts to migratory bird species. However, implementation of Project specific design criteria (Section 2.5.2.1), including pre-construction migratory bird nesting surveys, would alleviate this potential impact.

Noise levels associated with construction, such as from helicopter activities, could cause a direct adverse impact to migratory bird species that occupy habitats impacted by the Project, but would be short-term, ending when construction terminates. Studies have shown that reductions in bird population densities in both open grasslands and woodlands may be attributed to a reduction in habitat quality produced by elevated noise levels (Reijnen et al. 1997, 1995). Although visual stimuli in open landscapes may contribute to reduced bird densities at relatively short distances, the impacts of noise appear to be the most critical factor since breeding birds of open grasslands (threshold noise range of 43 to 60 dBA) and woodlands (threshold noise range of 36 to 58 dBA) respond very similarly to disturbance by traffic volume (Reijnen et al. 1997). Reijnen et al. (1996) determined a threshold effect for bird species to be 47 dBA, while a New Mexico study in a piñon-juniper community found that impacts of gas well compressor noise on bird populations were strongest in areas where noise levels were greater than 50 dBA. However, moderate noise levels (40 to 50 dBA) also have shown some effect on bird densities (LaGory et al. 2001). Anticipated impacts from the Project would be negligible.

BCC species that could potentially be impacted by Project construction and operation include the Lewis' woodpecker and Cassin's finch. Impacts to Lewis woodpecker are discussed in Section 4.10.5.2, Forest Service Sensitive and Management Indicator Species. Potential direct impacts resulting from Project alternatives or variants to the Cassin's finch would include the incremental loss, conversion, and fragmentation of potentially suitable breeding, roosting, and foraging habitat as a result of construction and operation activities. Although direct impacts to this species preferred habitat of coniferous forest within the Project area would be greatest under Alternative D, this impact is anticipated to be minor and not result in the decline of local populations due to the placement of the majority of the Project within existing ROWs and the abundance of available habitat within the Project vicinity. The effects of fragmentation from Project construction would be limited in nature as completion of the Project for Alternatives A, B, and C, including the variants, would result in the consolidation of existing ROWs into a single ROW. Overall, the consolidation of ROWs, and the removal of tall vegetation within the newly created ROW, would likely result in increased foraging opportunity as these species typically forage in open areas.

Short-term and long-term impacts to migratory bird species would be similar to those discussed for other species. Short-term effects due to the construction of the Project would result in the incremental loss of habitat. Recovery times of the various vegetation communities that provide habitat for the species within the wildlife analysis area are discussed in Section 3.7, Vegetation. Habitat loss or alteration would result in the displacement of species into adjacent habitats. Surface disturbance also would result in an incremental increase in habitat fragmentation along the Project off the existing ROWs, which would continue until reclamation was completed and vegetation re-established. However, long-term beneficial impacts would include the revegetation of the abandoned ROW as it reverts to natural conditions under all alternatives with the exception of Alternative D. Potential impacts also could include nest abandonment or loss of young. These temporary losses would reduce productivity for that breeding season. Because the majority of Project activities are within existing ROWs and there is potential for the abandonment of one ROW, these impacts would be minor or negligible within Project ROWs.

Long-term effects to other bird species due to impacts from operations are similar to short-term effects due to construction; however, they would be less intensive and would continue until after the end of the Project's design life. These impacts generally would be minor, especially since many of the roads and most of the ROWs currently exist. Long-term beneficial impacts would include the revegetation of the abandoned ROW as it reverts to natural conditions under all alternatives with the exception of Alternative D.

<u>Amphibians and Reptiles</u>

Three special status amphibian and reptile species could occur within the Project vicinity. These amphibian and reptile species are discussed in Section 4.10. Potential impacts to other non-special status amphibian and reptile species are discussed below.

Potential direct impacts resulting from construction and operation of Alternatives A, B, C, and D, or Variant A1 to amphibian and reptile species would include the incremental loss and disturbance of potentially suitable seasonal breeding and foraging habitat located adjacent to and upland of riparian areas and mortalities resulting from collisions with vehicles or construction equipment. Details regarding the drainages and wetlands crossed by Alternatives A, B, C, and D are listed in **Tables 3.5-2** and **3.6-1**. Construction traffic within the ROW could result in amphibian mortalities during breeding and feeding migrations to and from associated habitat including flooded areas, wetlands, streams, ponds, or lakes. Vehicle use within or adjacent to drainages and wetlands with existing roads (**Table 3.6-1**) could cause amphibian mortalities as they use these habitats throughout the year. Potential indirect impacts include vehicle activity causing increased sediment on a temporary basis in stream or riparian areas. Impacts would be minor based on the implementation of Project SCPs and EPMs (Section 2.5) involving associated habitat within the Project area.

Short-term effects would include the temporary loss and disturbance of amphibian and reptile habitat due to construction activities. Long-term impacts would include those resulting from operations and maintenance of the transmission line, such as mortalities resulting from collisions of individuals with maintenance vehicles and disturbance from the presence of maintenance personnel. Impacts would be minor based on the implementation of Project SCPs and EPMs (Section 2.5) involving associated habitat within the Project area.

4.9.5.2 Variants A2 and C1

Variants A2 and C1 would differ from Alternatives A and C at the western-most segments where the alternatives would be constructed underground following a new alignment (see **Figure 2.2-2**), and would be buried. Construction of buried lines would impact greater continuous surface area during construction compared to aboveground construction, as a trench would be dug to bury the conductors in conduits. Avoidance of specific species and habitats may not be feasible for these alternatives. Related discussions of impacts are discussed further below.

Big Game

The types of direct, indirect, short-term and long-term impacts to big game species under Variants A2 or C1 would generally be the same as described under Alternatives A, B, C, and D or Variant A1. However, Alternative D would require greater surface disturbance due to the installation of a greater number of structures (**Table 2.3-5**). Additionally, under Variants A2 or C1, there would be an increase in surface disturbance during construction activities and long-term loss of woody vegetation during operations due to the cleared 75-foot ROW over buried lines.

Other Mammals

The types of direct, indirect, short-term and long-term impacts to other mammal species under Variants A2 or C1 would generally be the same as described under Alternatives A, B, C, and D or Variant A1. Similar to big games species, Alternative D would require greater surface disturbance due to the installation of a greater number of structures (**Table 2.3-5**). Additionally, Variants A2 or C1 would result in an increase in surface disturbance during construction activities and long-term loss of woody vegetation during operations due to the cleared 75-foot ROW over buried lines. However, because portions of the buried lines are within open vegetation communities, the potential for predation by raptors would be reduced in areas where the lines are buried.

Upland Game Birds

The types of direct, indirect, short-term and long-term impacts to upland game birds under Variants A2 or C1 would generally be the same as described under Alternatives A, B, C, and D or Variant A1, but would result in an increase in surface disturbance during construction activities and long-term loss of woody vegetation during operations due to the cleared 75-foot ROW over buried lines. However, because portions of the buried lines are within open vegetation communities, the potential for predation by raptors would be reduced in areas where the lines are buried. Furthermore, Alternative D would require greater surface disturbance due to the installation of a greater number of structures (**Table 2.3-5**).

Raptors

The types of direct, indirect, short-term and long-term impacts to raptors under Variants A2 or C1 would generally be the same as described under Alternatives A, B, C, and D or Variant A1. The primary short-term impact to raptors would be the incremental loss of foraging, breeding, and nesting habitat due to construction activities. The primary long-term effects to raptors from Project operation would be mortalities as a result of collision with transmission line components. These long-term impacts would be reduced relative to Alternatives A, B, C, and D or Variant A1, as a portion of the Project would be buried. Additionally, Alternative D would require greater surface disturbance due to the installation of a greater number of structures (**Table 2.3-5**). As with Alternatives A, B, C, and D or Variant A1, the avian wildlife Project specific design criteria (per Section 2.5.2.1, Avian Wildlife) would be conducted.

Other Birds

The types of direct indirect, short-term and long-term impacts to other bird species under Variants A2 or C1 would generally be the same as described under Alternatives A, B, C, and D or Variant A1, but would result in an increase in surface disturbance during construction activities and long-term loss of woody vegetation during operations due to the cleared 75-foot ROW over buried lines. Additionally, the potential for predation by raptors and collisions with overhead transmission lines would be reduced in areas where the Project was buried in otherwise treeless habitats. Alternative D would also require greater surface disturbance due to the installation of a greater number of structures (**Table 2.3-5**).

Amphibians and Reptiles

The types of direct indirect, short-term and long-term impacts to amphibians and reptiles from Variants A2 or C1 would be similar to those described for Alternatives A, B, C, and D or Variant A1, but the extent of disturbance within associated habitats would be greater along these two variants in areas where the Project was buried. Alternative D would also require greater surface disturbance due to the installation of a greater number of structures (**Table 2.3-5**). Disturbance within wetlands and aquatic habitats would not be avoided; direct mortalities and loss of habitat could occur in these areas. There is greater potential for significant impacts at these locations under Variants A2 or C1.

4.9.6 Mitigation

Based on the Project specific design criteria and the applicable SCPs and EPMs, no additional mitigation measures have been identified.

4.9.7 Residual Impacts

Short-term residual impacts to big game, other mammal species, raptors, and other birds from the construction of any Project alternative would be minimized by the application of EPMs, SCPs, and design criteria (see Section 2.5), and are not anticipated to be significant (i.e., would not result in the loss of individuals of a population of wildlife to a degree that would result in species being listed or proposed for listing as threatened or endangered). Short-term residual impacts to wild turkey would be possible if construction occurs within a wild turkey production area during the nesting period between March 15 and August 15. Short-term impacts to amphibians would be minimized within identified and avoided riparian areas; however, individuals could be impacted in adjacent upland areas during wet seasons.

Long-term residual impacts to wildlife would include the loss of vegetation related to the permanent placement of facilities, and access roads for the life of the Project. Wildlife injuries and mortalities are expected to occur as a result of collisions with transmission structures, guy wires (No Action and Alternative D), transmission conductors, and vehicles. Quantification of these impacts is not presented in this analysis due to the lack of available data and the variability of wildlife populations. These residual impacts are anticipated to be minor and not result in the loss of individuals of a population of wildlife to a degree that would result in species being listed or proposed for listing as threatened or endangered. Additional beneficial residual impacts would be the increase in habitat and decrease in human disturbance should an alternative be selected where ROWs would be consolidated and one would be allowed to return to a natural state.

It is anticipated that reclamation efforts would be successful and no permanent residual impacts to habitats would occur. Timeframes for successful reclamation can vary by habitat type and initial impact intensity. During extended periods of reclamation, it is expected that habitat function may be reduced until reclamation is complete.

Acres of wildlife habitat affected under Alternatives A, B, C, and D and Variant A1 are included in **Tables 4.7-1**, **4.7-3**, **4.7-4**, and **4.7-6**. Based on total disturbance, short-term and long-term residual impacts would be greatest under Alternative D. Variants A2 and C1 would generally have the same short-term and long-term residual impacts as Alternatives A, B, and C and Variant A1, except for greater impacts to big game and lower potential for impacts to birds.

4.9.8 Irreversible and Irretrievable Commitment of Resources

No irreversible or irretrievable commitments would be anticipated for wildlife resources. During Project operation, vegetation posing operational or safety challenges would be removed from a portion of the

ROW to facilitate maintenance for the life of the Project; however, this loss would be countered by the establishment of new vegetation more compatible with transmission line operations until the end of the Project life, as well as the return of a ROW to natural condition should a combined alternative be selected.

4.9.9 Relationship between Short-term Uses and Long-term Productivity

Long-term impacts could include the reduction of wildlife habitat within the analysis area off existing ROWs. Additionally, short-term impacts associated with increased human presence and noise associated with construction could displace animals from suitable cover, foraging, and breeding sites. However, because most species would be able to relocate to adjacent suitable habitats for the short term, populations would continue to persist and utilize available habitat in the long term.

4.10 Special Status and Sensitive Wildlife Species

Special status species are those species for which state or Federal agencies afford an additional level of protection by law, regulation, or policy. Included in this category are federally listed species that are protected under the ESA and species designated as sensitive by the USFS. In addition, the State of Colorado maintains a list of state-protected and sensitive species (CRS 33-2-105) that includes many of the USFS sensitive species as well as ESA-listed species. In accordance with the ESA, Western and the USFS, in coordination with the USFWS, must ensure that any action that they authorize, fund, or carry out would not adversely affect a federally listed species. As noted in Section 3.10, Western consulted with the USFWS and concurrence regarding the determination of effects on the species analyzed as a result of the Project was received on November 14, 2017. The FSM 2670 describes regulatory requirements for USFS sensitive species.

The impact analysis area for wildlife resources includes a 100-foot area along each side of linear features (transmission lines and access roads), a 300-foot-wide area centered along the new routing options, and a 75-foot area centered on the underground variants. As discussed in Section 4.9, no impacts from the Project or alternatives are expected to occur to aquatic wildlife or their habitats; therefore, impacts to aquatic wildlife are not further discussed in this section.

Issues considered in assessing the environmental consequences of the Project and alternatives on special status species were identified by Western through internal scoping, consultation with cooperating agencies, and through comments provided during public scoping. Those issues include:

- The loss or decline of special status species (i.e., federally listed, proposed or candidate species for listing under the ESA); USFS MIS, USFS sensitive species, and species protected by Colorado state law and their associated habitats.
- Collision of special status or sensitive bird species with transmission lines.

4.10.1 Methodology

Impacts to special status and sensitive wildlife species from the Project are based on the locations of the resources in relation to the proposed surface disturbance areas. SCPs and EPMs (Section 2.5) are taken into account in addressing the severity of the impact. The acres of disturbed areas were estimated based on the extent of disturbance for construction and operation activities.

4.10.2 Significance Criteria

A significant impact on special status species or their critical habitats would result if any of the following were to occur from constructing and operating the Project:

- Jeopardizing the continued existence of a special status species.
- Loss of individuals from a species population that would result in a change in species status.

- Adversely modifying Critical Habitat to the degree it would no longer support the species for which it was designated.
- Violation of any Federal or other applicable statutes or regulations pertaining to special status species.

4.10.3 Impacts Common to All Alternatives

Direct and indirect impacts to special status wildlife species and their habitats would occur from surface disturbance associated with construction and operation activities in the ROW. If impacts occur within specific sensitive species habitat, direct impacts could include trampling/crushing of special status species individuals, the removal or conversion of habitat, the potential for mortalities resulting from collision with transmission lines, and avoidance of the Project area due to the increased noise and disturbance resulting from the increased presence of humans.

Indirect effects to special status species could result from increased erosion, sedimentation, fugitive dust generation, the spread and establishment of noxious and invasive weed species, disturbance from human presence during construction and maintenance activities, noise, and habitat fragmentation. Adverse effects from noise associated with construction, such as helicopter activities, are anticipated to be minor and short-term, ending when construction terminates.

Any potential impacts to special status wildlife species individuals or habitat are likely to be minor, given limited anticipated surface disturbance, the use of existing ROWs and access roads, and Western's commitment to reclaim disturbed areas. Long-term impacts would include loss or conversion of habitat associated with the permanent facilities and access roads during the life of the Project, and the loss of woody vegetation habitat that is removed or restricted from the ROW for the life of the Project. These adverse impacts would be minor and long-term, considering that maintenance activities will occur over the life of the Project. However, the impacts to wildlife species resulting from the long-term loss of habitat would be reduced through the utilization of existing transmission ROWs and access roads and the abandonment of one ROW under all alternatives with the exception of the No Action Alternative and Alternative D.

4.10.4 No Action Alternative

The No Action Alternative, including the small segment involving the re-location of the line at the Newell Lake View subdivision, would pose impacts similar to the other alternatives, except potential impacts would occur over a longer span of time and impact a larger area. Maintenance requirements and activities on the existing lines would likely increase at various locations of the line more often than with the other alternatives that include the consolidation of two ROWs into one. In addition to on-going maintenance activities, including as-needed structure replacement, the No Action Alternative would involve the acquisition of additional ROW and access roads at locations where the current ROW is insufficient to maintain appropriate vegetation clearances and compliance with applicable reliability standards.

Short-term and long-term effects under the No Action Alternative would be similar to current levels described in Section 4.10.3. Minor impacts from general maintenance would be anticipated to increase with a general increase in maintenance activities. Short-term and long-term effects in the area of the Newell Lake View subdivision re-route would be similar to those described for all action alternatives in Section 4.10.5, but would be reduced in total acreage.

4.10.5 Impacts Unique to Specific Action Alternatives

As described in Section 4.9.5, the types of direct, indirect, short-term, and long-term impacts to wildlife species resulting from any action alternative or variant would be the same as those discussed in Section 4.10.3. Additional impacts to special status and sensitive wildlife are described in the following sections. Avoidance of specific species and habitats may not be feasible for Variants A2 or C1. Acres of habitat disturbance for each alternative are summarized in **Tables 4.7-1** through **4.7-6**.

The effects of habitat conversion and fragmentation from Project construction would be limited in nature and could potentially benefit some wildlife species as completion of the Project with Alternatives A, B, or C or their variants would result in the consolidation of multiple existing ROWs and transmission lines into a single ROW and a single transmission line. Overall, the consolidation of ROWs, and the removal of tall vegetation within the newly created ROW would likely result in increased foraging opportunity for those species that typically forage in open areas.

4.10.5.1 Federal Threatened, Endangered, Proposed, and Candidate Species

Preble's Meadow Jumping Mouse

Direct impacts to the Preble's meadow jumping mouse could include trampling/crushing of individuals, modification of wildlife behavior, and the removal of native vegetation that provides habitat. Indirect effects to wildlife species and their habitats could include increased erosion, sedimentation, the spread and establishment of noxious and invasive weed species, disturbance from human presence during construction and maintenance activities, noise, and habitat fragmentation. Adverse effects from noise associated with construction, are anticipated to be minor and short-term, ending when construction terminates.

There are benefits of consolidating two separate lines into one ROW and letting the abandoned ROW revert to natural conditions as planned under the proposed alternatives, with the exception of Alternative D. They include the long-term re-establishment of a natural state of vegetation considered associated wildlife habitat along one of the existing ROWs. Maintenance and operation activities associated with noise and human disturbance also would be reduced when limited to one ROW instead of two. In addition, depending on coordination with the USFS on road closures, there may be a reduction in trails that could be utilized by off-roaders.

Only a small amount of marginal potential habitat has been identified within the Project area and that is at a higher elevation than most preferred PMJM habitat (7,600 feet). Surveys for the species from other recent studies have found specimens in the Flatiron Reservoir area (6,278 feet); however this portion of the Project has no impact to riparian habitat in that area. Riparian habitat along the reservoir is separated by over 700 feet from the work zones and the US Bureau of Reclamation facility and Campground which includes paved access and parking lots. All construction activity would be confined to arid uplands west of the Flatiron Substation. Implementation of SCPs 32 through 35, as discussed in **Table 2.5.1,** would avoid and span the transmission line over wetland, riparian, and waterbodies and therefore, avoid, construction in this habitat, impacts would be reduced for Alternatives A, B, C, D, and Variant A1.

The locations of all access roads within the Project area have not yet been defined. However, Western would use existing roads to access either side of large streams and wetlands, minimizing disturbance to potential Preble's meadow jumping mouse habitat. With implementation of the EPMs, and SCPs, impacts to the Preble's meadow jumping mouse and its habitat are expected to be avoided. Pre-construction surveys prior to surface disturbance would identify populations and occupied habitats if any are present, and allow Western to micro-site facilities and/or use SCPs to avoid direct impacts to this species and its habitat. However at this time it is not possible to guarantee that some work may not be required within 300 feet of suitable habitat.

Mexican Spotted Owl

Given the lack of suitable nesting habitat in the area and multiple audio surveys done in the surrounding area with negative results, it is highly unlikely that Mexican spotted owl inhabit any of the Project area. Potential direct impacts to the Mexican spotted owl from the construction and operation of Project alternatives could include the incremental loss or alteration of potentially suitable foraging habitat, a potential reduction in prey base and increased human disturbance, and collision with transmission line components. Impacts to small mammal populations due to habitat loss as discussed above in Section 4.9.5 can result in a reduced prey base for this species, causing lower population densities. Maintenance activities (vegetation management, ground or air inspections, and repair work) would cause indirect impacts, but would be less intense and shorter in duration than long-term impacts.

Although there would be impacts from decommissioning activities, there are benefits of consolidating two separate lines into one ROW, and letting the abandoned ROW revert to natural conditions as planned under the Project alternatives, with the exception of Alternative D. They include the long-term re-establishment of a natural state of vegetation considered as associated wildlife habitat along one of the existing ROWs. Maintenance and operation activities associated with noise and human disturbance also would be reduced when limited to one ROW instead of two. In addition, there may be a reduction in trails that could be utilized by off-roaders as well, thus reducing those disturbance impacts. Co-locating transmission lines into one ROW would reduce the potential for collisions.

4.10.5.2 Colorado State Threatened, Endangered, and Special Concern Species

Townsend's Big-eared Bat

Potential direct effects to this species as a result of Project alternatives or variants include the short-term incremental reduction of potential foraging habitat during construction and avoidance of the Project area due to increased human presence and noise. The potential for mortalities of individuals resulting from collisions with transmission lines, construction equipment and vehicles on access roads also would exist under Project alternatives or variants. However, these impacts would be limited in nature as construction and maintenance activities in the Project area would occur during daylight hours only, areas temporarily disturbed by construction would be revegetated, the utilization of existing ROWs and access roads, and trend of the existing power line ROWs to open areas of native shrub vegetation communities would benefit this species through the expansion of available foraging area. Therefore the impacts to this species would be low to negligible.

Alternative D would result in the greatest amount of direct impacts to the preferred habitat of this species as shown in **Tables 4.7-1** through **4.7-6**. Conversely, Alternative C would result in the least amount of direct impacts to this species habitat.

Bald Eagle, American Peregrine Falcon

Potential direct impacts resulting from Project alternatives or variants to these species would include the incremental loss and disturbance of potentially suitable breeding and foraging habitat and mortalities resulting from potential collisions with the transmission lines. Potential indirect impacts to these species as a result of Project alternatives or variants would include the short-term avoidance of otherwise suitable habitat (Pinewood Reservoir) by these species due to increased noise and human activity during construction. Although no nests for either of these species have been documented within the Project area, if Project construction was to occur during the raptor breeding season, a migratory bird nesting survey would be conducted prior to any construction activities in order to avoid potential impacts to active nests as described in Section 2.5 under Project Specific Design Criteria.

Long-term impacts from operations could result from habitat disturbance and fragmentation in areas where facilities would be sited or off the existing ROWs, and periodic vegetation management activities occur. These would include wildlife mortalities that occur as a result of maintenance activities and displacement due to habitat degradation from noise and human activity in and along the transmission line ROW. However, long-term beneficial impacts would include the revegetation of the abandoned ROW as it reverts to natural conditions and the reduction of these adverse impacts under all alternatives with the exception of Alternative D. Due to the limited nature of foraging habitat for these species within the Project area, the probability of adverse impacts is considered to be negligible.

Boreal Toad, Northern Leopard Frog, Common Garter Snake

Potential direct impacts, resulting from Project alternatives or variants to these species would include the incremental loss and disturbance of potentially suitable breeding and foraging habitat and mortalities resulting from vehicles or construction equipment. Vehicle and equipment crossings of streams or suitable seasonal upland habitat could cause amphibian mortalities during spring and summer breeding migrations to and from flooded areas, wetlands, streams, ponds, or lakes. The potential for these adverse impacts to occur would be reduced by the implementation of SCPs 32 through 35, as discussed in **Table 2.5.1**. Because construction of overhead transmission lines would span, and therefore, avoid, construction in this habitat, impacts would be negligible for Alternatives A, B, C, D, and Variant A1.

A greater potential for adverse impacts would exist for Variants A2 or C1. These variants have not been surveyed for suitable habitat. Per SCPs, the specific design criteria, and the EPMs for addressing wetland habitat in Section 2.5, any disturbance within wetlands and aquatic habitats would be avoided, if practical. Impacts would include direct mortalities and loss of habitat within these areas.

Potential indirect impacts would include vehicle activity causing increased sediment on a temporary basis in streams or suitable upland seasonal habitat crossed by Project vehicles. Impacts would be negligible for routes other than Variants A2 and C1, where impacts could be minor.

Short-term effects would result from the temporary loss and disturbance of habitat for these species due to construction activities of which a percentage would be immediately reclaimed following construction of the facilities. Impacts would be negligible for routes other than Variants A2 and C1, with the implementation of the SCPs, the specific design criteria, and the EPMs as described in Section 2.5.

Long-term impacts could include individual mortalities resulting from maintenance vehicles, or migration due to disturbance from the presence of maintenance personnel. Because the frequency of maintenance vehicles crossing the streams during wet periods would be low, impacts to these species would be minor.

4.10.5.3 Forest Service Sensitive Species

The following impact discussions include those species determined to potentially occur in the Project area as noted in Section 3.10.3, Forest Service Sensitive and Management Indicator Species.

American Marten

Impacts to this species from surface disturbance activities would include the loss of habitat potentially resulting in the displacement of species into adjacent habitats. Surface disturbance also would result in an incremental increase in habitat fragmentation along the Project until reclamation has been completed and vegetation is re-established.

The road network, which would be constructed or upgraded to fulfill the construction requirements of the Project, may impact this species to varying degrees depending on the geographical location and the type of habitat disturbed. Impacts to this species from the construction and maintenance of construction and access roads would be similar to those discussed for other mammal species discussed in Section 4.9. These impacts generally would be minor and are not anticipated to have a significant effect upon local populations.

The primary potential direct adverse impact to this species would be avoidance (displacement) of otherwise suitable habitat in the vicinity of Project disturbance areas due to noise and human activity during construction. This impact would have minor effects on marten, a species that is wide-ranging and relatively tolerant of human presence. Indirect impacts resulting from construction of Project alternatives or variants would result in increased human activity and noise in the vicinity of the transmission line ROW. Avoidance could result in displacement of animals from an area larger than the actual disturbance area. Following avoidance of human activity and noise-producing areas during construction, this species may acclimate to the activity and begin to return to areas that were formerly avoided. These impacts generally would be minor.

Effects due to the construction of the Project alternatives or variants would result from the incremental loss of habitat (**Tables 4.7-1** through **4.7-6**), of which a percentage would be immediately reclaimed following construction of the facilities and once the abandoned ROW reverts to natural conditions under all alternatives with the exception of Alternative D. This species does not typically inhabit areas that have been burned or recently cleared of vegetation. Although direct impacts to this species preferred habitat would be greatest under Alternative D, these impacts are anticipated to be minor due to the relative abundance of forested habitat types in the Project vicinity.

Long-term effects to this species due to operations would be similar to short-term effects due to construction; however, they would be less intensive and longer in duration. Potential long-term effects include marten mortalities that occur as a result of maintenance activities, increased risk of predation by raptor species which may perch on transmission lines and structures, and habitat degradation resulting from increased noise and human activity in, and along, the transmission line ROW. Long-term effects also would include the beneficial impact of added habitat for the alternatives that consolidate two ROWs into one.

Fringed Myotis (also MIS)

Potential direct effects to this species as a result of Project alternatives or variants would include the incremental habitat fragmentation from vegetation removal and avoidance of otherwise suitable habitat due to increased noise and human activity during construction. The effects of fragmentation from Project construction would be limited in nature as completion of the Project with Alternatives A, B, and C or their variants would result in the consolidation of existing ROWs into a single ROW. Although direct impacts to this species preferred habitat would be greatest under Alternative D, these impacts are anticipated to be minor due to the relative abundance of forested habitat types in the Project vicinity.

The potential for mortalities of individuals resulting from collisions with transmission lines, construction equipment and vehicles on access roads also would exist under Project alternatives or variants. However, these impacts would be limited in nature as existing ROWs and access roads would be utilized, construction and maintenance activities in the Project area would occur during daylight hours only, areas temporarily disturbed by construction would be revegetated, and trend of the existing power line ROWs to open areas of native shrub vegetation communities would benefit this species through the expansion of available foraging area.

Therefore impacts to this species would be low to negligible.

Townsend’s Big-eared Bat

The Townsend’s big-eared bat is discussed in Section 4.10.5.1, Colorado State Threatened, Endangered, and Special Concern Species.

Hoary Bat

Potential foraging impacts to this species would be similar to those described above for the fringed myotis. In addition, the potential for impacts to roost or maternity sites due to the removal of more mature, larger trees with the expansion of the ROW also would exist for this species. Loss of trees could result in a minor reduction of possible roost or maternity sites for individual bats, but this loss would be negligible compared to possible roost or maternity site trees available outside of the ROW. Although individual bats could be displaced from roost or maternity sites with expansion of the ROW, direct mortality is not likely for this highly mobile species because it roosts in the foliage at the ends of branches. It is likely that a bat roosting on a tree would be able to fly away before potential injury from tree felling occurred.

Flammulated Owl

Potential direct effects to this species as a result of Project alternatives or variants would include the incremental habitat fragmentation from vegetation removal (**Tables 4.7-1** through **4.7-6**), avoidance of otherwise suitable habitat due to increased noise and human activity, and the potential for mortalities resulting from collision with transmission lines. The effects of fragmentation from Project construction with Alternative A, B, C, or their variants would be limited in nature as completion of the Project would result in the consolidation of existing ROWs into a single ROW and through the use of existing ROWs and access roads under all alternatives. Additionally, trees removed by maintenance activities and expansion of the existing ROW would be relatively young and would not likely support cavity nesting activity by flammulated owl. However, there are areas of mature forest where taller trees, danger trees, and snags could be removed during ROW expansion; leading to a relatively small risk for the potential loss of a nest tree. Direct impacts to this species preferred habitat within the Project area would be greatest under Alternative D. This potential impact is anticipated to be minor in significance and not result in long-term declines of local populations.

Based on the Project design criteria, no Project construction would occur during the raptor breeding season, and there would be no direct or indirect impacts to the flammulated owl due to loss of nests or nest abandonment due to increased noise and human activity in proximity to an active nest site.

Long-term impacts from operations could result from habitat disturbance and fragmentation in areas where facilities would be sited and periodic vegetation management activities occur. Impacts could include wildlife mortalities as a result of maintenance activities and displacement due to habitat degradation resulting from noise and human activity in and along the transmission line ROW. However, long-term beneficial impacts would include the revegetation of the abandoned ROW as it reverts to natural conditions and the reduction of these adverse impacts under all alternatives with the exception of Alternative D. Therefore impacts to this species would be minor.

Lewis' Woodpecker and Olive-sided Flycatcher

Potential direct impacts resulting from Project alternatives or variants to these species would include the incremental loss, conversion, and fragmentation of potentially suitable breeding, roosting, and foraging habitat as a result of construction and operation activities. Although direct impacts to these species preferred habitat of coniferous forest within the Project area would be greatest under Alternative D, this impact is anticipated to be minor in significance and not result in the decline of local populations due to the abundance of available habitat within the Project vicinity. The effects of fragmentation from Project construction would be limited in nature as completion of the Project would result in the consolidation of existing ROWs into a single ROW, with the exception of Alternative D, and the use of existing ROWs and access roads under all alternatives. Per the Project-specific design criteria, avian nesting surveys would be conducted prior to construction to ensure ground disturbing activities do not result in the "take" of an active nest or migratory bird protected under the MBTA. If construction occurs during the avian breeding season (roughly between March 15 and September 1), surveys would be conducted no earlier than 72 hours prior to any ground disturbing activities to ensure the Project complies with the MBTA (Section 2.5.2.1). Thus, impacts to nesting migratory birds are not anticipated.

Short-term effects due to the construction of the Project alternatives or variants would result in the incremental loss of habitat, of which a percentage would be immediately reclaimed following construction of the facilities. Loss of habitat could result in the displacement of species into adjacent habitats. Surface disturbance also would cause an incremental increase in habitat fragmentation in the analysis area until reclamation has been completed and vegetation is re-established. These impacts would be a minor or negligible within Project ROWs.

Long-term impacts from operations could result from habitat disturbance in areas where facilities would be sited and periodic vegetation management activities, and could include wildlife mortalities resulting from collisions with maintenance vehicles or with transmission lines, and displacement due to habitat degradation from noise and human activity in and along the transmission line ROW. However, long-term beneficial impacts would include the revegetation of the abandoned ROW as it reverts to natural conditions and the reduction of these adverse impacts under all alternatives with the exception of Alternative D. Therefore impacts to this species would be minor.

Northern Goshawk

The potential for adverse impacts to this species is considered low due to the limited availability of mature old-growth coniferous forest habitat within the Project area. Occurrences of the northern goshawk would be limited to areas of coniferous forest. Potential direct effects to this species as a result of constructing Project alternatives or variants would include the incremental habitat fragmentation from vegetation removal (**Tables 4.7-1** through **4.7-6**), avoidance of otherwise suitable habitat due to noise and human activity, and the potential for mortalities resulting from collision with transmission lines. The effects of fragmentation from Project construction would be limited in nature as completion of the Project would result in the consolidation of existing ROWs into a single ROW, with the exception of Alternative D, and the use of existing ROWs and access roads under all alternatives. Therefore, direct impacts to this species preferred habitat within the Project area would be greatest under Alternative D. This potential impact is anticipated to be minor and not result in long-term declines of local populations.

Based on the Project Specific Design Criteria (Section 2.5), if Project construction was to occur during the raptor breeding season, a migratory bird nesting survey would be conducted prior to any construction activities in order to avoid potential impacts to active nests. No surface occupancy (beyond that which historically occurred in the area) within a 0.5-mile radius of active nests would be maintained where feasible (CPW 2008). When distance buffers are not possible because of Project proximity and additional agency consultation concurs, no project construction or human encroachment would occur within a 0.5-mile radius during the raptor breeding season March 1 through September 15 around active northern goshawk nests (CPW 2008). Therefore, direct or indirect impacts to the northern goshawk resulting in the loss of nests or nest abandonment due to increased noise and human activity in proximity to an active nest site would be avoided.

Long-term impacts from operations could result from habitat disturbance and fragmentation in areas where facilities would be sited and periodic vegetation management activities. Impacts could include wildlife mortalities occurring as a result of maintenance activities and displacement due to habitat degradation resulting from noise and human activity in and along the transmission line ROW. However, long-term beneficial impacts would include the revegetation of the abandoned ROW as it reverts to natural conditions and the reduction of these adverse impacts under all alternatives with the exception of Alternative D. Therefore impacts to this species would be minor.

American Peregrine Falcon

The American peregrine falcon is discussed in Section 4.10.5.1, Colorado State Threatened, Endangered, and Special Concern Species.

Boreal Toad (also MIS) and Northern Leopard Frog

The Boreal toad and Northern leopard frog are discussed in Section 4.10.5.1, Colorado State Threatened, Endangered, and Special Concern Species.

Arapahoe Snowfly and Hudsonian Emerald Dragonfly

The potential for adverse impacts to these species is considered low due to the limited availability of suitable habitat within the Project area. Based on the Project design, no direct impacts to these species are anticipated. The Solitude Creek wetland between poles 4-6 and 4-7 (E-PH) would be avoided during construction. In accessing the existing E-PH Structure 4-7, Western would avoid the fen by assessing the structure from an existing two-track road located south of the fen. For Alternatives A, A1, and A2, Western would only need to access the Structure 4-7 to disassemble and cut up the structure. Road improvements for this alternative are not anticipated. For Alternatives B, C, and D, Western would need to improve roads to accommodate construction and maintenance vehicles. Solitude Creek beneath the E-PH line does not represent potential habitat for Arapahoe snowfly. Therefore, it is unlikely there would be any direct or indirect impacts to possible Arapahoe snowfly from Alternatives B and C.

Potential indirect effects include the degradation of water quality during construction activities. However, the use of best management practices to minimize sediment discharge, as well as the broad vegetative filter strip that occurs between the Project area and any nearby watercourses or wetlands, would preclude sediment contribution to potential Arapahoe snowfly habitat. No aspect of the Project would affect water volume downgradient from the Project area. Since no road construction would occur across Solitude Creek, the area is not likely to directly or indirectly affect flows or water quality in downstream portions of the creek.

4.10.5.4 Forest Service Management Indicator Species

<u>Elk and Mule Deer</u>

Direct and indirect impacts to elk and mule deer are described in Section 4.9, Wildlife.

<u>Golden-crowned Kinglet and Hairy Woodpecker</u>

Potential direct impacts, resulting from Project alternatives or variants to these species would result from the incremental loss of potentially suitable breeding, roosting, and foraging habitat. Because of the existing forest types within the Project area, it is unlikely that golden-crowned kinglets are present. Implementation of the Project alternatives would result in some minor losses of tree cover to expand the ROW and construction activities could result in some minor and short-term disruption of individual golden-crowned kinglets. Overall, Project alternatives would likely have a neutral effect on populations of golden-crowned kinglets and changes populations trends at the planning unit level would not occur.

<u>Hairy Woodpecker</u>

Adverse impacts to this species could result from trees removed by maintenance activities and expansion of the existing ROW. The majority of trees designated for removal would be relatively young, but could include trees likely to support foraging and cavity nesting activity by hairy woodpecker. Therefore, the potential loss of a nest tree does exist under the Project action alternatives. Because of the extensive amount of beetle-killed or dying trees in the analysis area and adjacent areas of forest, the loss of a few potential forage trees or a nest cavity tree would be inconsequential for local populations of hairy woodpecker. However, if nesting hairy woodpeckers are discovered during preconstruction surveys or during construction, actions would be taken to avoid the nesting activity in accordance the Project specific design criteria.

Construction and maintenance activities could result in hairy woodpecker's short-term avoidance of the immediate area of activity should this species be present at the time of this activity. The possible short-term avoidance of construction and maintenance activities would not have any adverse effects on local populations of hairy woodpecker since the analysis area is relatively small in relation to available adjacent habitats, and any avoidance would be for a relatively short time period.

<u>Mountain Bluebird</u>

Expansion of the ROW is unlikely to create grassland openings large enough to create preferred habitat areas for mountain bluebird. Implementation of the any of the action alternatives would result in some minor losses of tree cover to expand the ROW and construction activities could result in some minor and short-term disruption of individual mountain bluebirds if they are present. Overall, Project construction and operation would likely have a neutral effect on populations of mountain bluebird and changes in population trends at the planning unit level would not occur.

Pygmy Nuthatch

Adverse impacts to this species could result from trees removed by maintenance activities and expansion of the existing ROW. The majority of trees designated for removal would be relatively young, but could include trees likely to support foraging and cavity nesting activity by pygmy nuthatch. Therefore, the potential loss of a nest tree does exist under the Project action alternatives. Because of the extensive amount of beetle-killed or dying trees in the analysis area and adjacent areas of forest, the loss of a few potential forage trees or a nest cavity tree would be inconsequential for local populations of pygmy nuthatch.

Construction and maintenance activities could result in pygmy nuthatch's short-term avoidance of the immediate area of activity should this species be present at the time of this activity. The possible short-term avoidance of construction and maintenance activities would not have any adverse effects on local populations of pygmy nuthatch since the analysis area is relatively small in relation to available adjacent habitats, and any avoidance would be for a relatively short time period.

Wilson's Warbler

Under Alternatives A, A1, and A2, potential direct impacts to this species habitat could occur at the crossing of Solitude Creek during the removal of existing Structure 4-7. Impacts would be short-term and limited to the removal of the existing structure. Road improvements for this alternative are not anticipated at this location as access to the site is available via an existing two-track road.

Potential impacts under the other Project action alternatives would be limited to the short-term avoidance of construction and maintenance activities by foraging Wilson's warblers. These impacts would not have any adverse effects on local populations of Wilson's warbler since the analysis area is relatively small in relation to available habitat on the planning unit area, and any avoidance would be for a relatively short time period. Therefore, the Project action alternatives may adversely impact foraging birds, but changes to Wilson's warbler populations or trends at the planning unit level would not occur.

Boreal Toad

The Boreal toad is discussed in Section 4.10.5.1, Colorado State Threatened, Endangered, and Special Concern Species.

4.10.6 Mitigation

Based on the Project specific design criteria, EPMs, and the applicable SCPs, no additional mitigation measures have been recommended.

4.10.7 Residual Impacts

Short-term residual impacts are those impacts to special status wildlife species from the construction of any Project alternative that would remain after the application of mitigation measures, EPMs, SCPs, and design criteria. Residual impacts to special status wildlife species, if any, are anticipated to be negligible.

Long-term residual impacts to special status wildlife species would include the loss of vegetation related to the permanent placement of facilities, and access roads for the life of the Project, and fragmentation of native habitats. Limited wildlife injuries and mortalities are expected to occur as a result of collisions with transmission towers, transmission lines, and vehicles. Quantification of these impacts is not presented in this analysis due to the lack of available data, the variability of wildlife populations, and low probability of occurrence. These residual impacts are anticipated to be negligible and not result in the decline of any special status wildlife species potentially occurring within the Project area. Additional beneficial residual impacts would be the increase in habitat and decrease in human disturbance should an alternative be selected where ROWs would be consolidated and one would be allowed to return to a natural state.

Based on total disturbance, short-term and long-term residual impacts would be greatest under Alternative D. After implementation of the Project-specific design criteria, EPMs, and the SCPs there would not be any significant impacts to special status wildlife species from any of the alternatives.

4.10.8 Irreversible and Irretrievable Commitment of Resources

No irreversible commitments would be anticipated for special status and sensitive wildlife species. Woody vegetation would be removed from a portion of the ROW to facilitate maintenance for the life of the Project; which would be an irretrievable loss of this habitat contributing to habitat fragmentation. This loss would continue until reclamation has been completed and the vegetation re-established, as well as the return of a ROW to natural condition should a combined alternative be selected.

4.10.9 Relationship between Short-term Uses and Long-term Productivity

Long-term impacts could include the reduction of wildlife habitat within the analysis area off existing ROWs. Additionally, short-term impacts associated with increased human presence and noise associated with construction could displace animals from suitable cover, foraging, and breeding sites. However, because most species would be able to relocate to adjacent suitable habitats for the short term, populations would continue to persist and utilize available habitat in the long term.

4.11 Land Use and Recreation

The analysis area for land use includes the transmission line ROWs and the immediate surrounding area up to 1 mile on either side of the proposed transmission line alternatives.

The analysis area for recreation consists of all recreation uses/areas within or adjacent to the transmission line alternatives, as well as any recreation uses/areas accessed from roads or trails that intersect the transmission line alignments.

The main issues related to land use and recreation include conflicts with land use plans and policies; long-term loss or conflicts with current land uses; conflicts with special use areas, recreational uses and outdoor activities; and loss of agricultural productivity. Other Key Issues related to land use and recreation as presented in Section 1.6.4.1, include:

- Effects of new ROW acquisition on land uses and property owners where an adequate ROW had not been previously acquired.
- Effects of the Project on recreational uses and experiences in the vicinity of Estes Park and Pinewood Reservoir, and on National Forest System lands accessed by USFS Road 122 (Pole Hill Road).
- Effects of the Project on protected areas, including county open space, lands protected by conservation easement, lands within the Stewardship Trust Program, and State Wildlife Areas.
- Effects of ROW expansion or new ROW acquisition on existing infrastructure (e.g., Upper Thompson Sanitation District's treatment plant) and other structures.

4.11.1 Methodology

4.11.1.1 Land Use

Rebuilding and operating the transmission lines and the associated effects resulting from construction activities and ROW restrictions were compared against existing land uses, including recreational uses, to determine if they would result in conflicts with these uses. Similarly, land use plans and zoning were reviewed in the areas that would be influenced by the Project to determine if the Project was consistent with planned land uses.

To determine if an action would cause a significant impact, the context of the Project was considered in conjunction with the intensity of the impact. The context of the Project is the locally affected area. Significance depends upon the effects in the local area.

Alternatives are compared with regard to the identified Key Issues by comparing: 1) acres of new ROW acquisition, 2) acres or length of land ownership type crossed, 3) number of landowners burdened by ROW acquisition for new or widened ROW, 4) number of open space and protected lands crossed, and 5) effects of ROW expansion on existing infrastructure.

4.11.1.2 Recreation

Potential direct and indirect effects to recreation caused by construction, operation, and maintenance of the Project were assessed by examining potential changes in recreational access, opportunities, and experiences that would result from implementation of the various alternatives. Consistency with current ROS designation(s) on National Forest System lands also is assessed.

4.11.2 Significance Criteria

4.11.2.1 Land Use

A significant impact on land use would result if any of the following were to occur from constructing or operating the Project:

- Major conflict with an existing use, such as the removal of a building, or restrictions that result in direct, readily identifiable conflicts with planned uses by Federal, state, or local governments, or the ability to expand an existing public utility.
- Conflict with applicable land use plans, policies, goals or regulations.
- Conflict with state or federally established, designated or reasonable foreseeable planned special use areas (e.g., recreation, wildlife management area, wilderness areas, etc.).

4.11.2.2 Recreation

A significant impact on recreation would result if any of the following were to occur from constructing or operating the Project:

- Permanent loss of access to a locally important recreation site/area.
- Loss/degradation of a recreation site/area of regional/national importance.
- Conflict with formally established recreation uses/opportunities (e.g., ROS class or limit/restrict a specific type of allowable activity or use at the site/area).

4.11.3 Impacts Common to all Alternatives

4.11.3.1 Land Use

Direct and indirect impacts would include disruptions to current land uses from Project construction and operation, including short-term disturbance during the construction phase, and to a lower degree, on-going activities associated with maintenance of the ROW and transmission structures. Maintenance activities currently occur along both of the existing lines, but the timing, frequency and location of these activities would be modified by the Project, in some instances staying the same or diminishing in certain locations as compared to existing conditions. New or expanded ROW required for Project construction and operation would be acquired by negotiating easements with private landowners and/or with local, state or Federal agencies. Land uses within new or expanded easements would be limited by ROW restrictions that prevent the construction of buildings or other incompatible uses. There would be beneficial impacts to the Newell Lake View subdivision as a result of removing the existing transmission line that traverses through several developed lots where homes have been built immediately adjacent to the existing transmission line ROW (single poles with a fiber optic line would be left for the operation of Pinewood dam). Overall, direct and indirect impacts to land use resulting from constructing and operating the proposed transmission lines would be minor to moderate and adverse to beneficial in both the short- and long-term. This broad range of impacts results from the variety of site-specific factors, and whether they involve construction of new ROW in woodlands or in shrubs and meadows, or the abandonment of ROW and re-growth of native vegetation.

During construction activities, short-term disturbance would be associated with establishing access, removing the existing H-frame structures, establishing staging areas and conductor stringing sites, and constructing new steel monopole or H-frame structures. The impacts to current land uses during construction would be short-term, decreasing when construction activities are completed. Long-term impacts would result from installation of permanent structures and transmission line, and ROW maintenance. The long-term loss resulting from transmission line structures would be very small (less than 0.1 acre), would mostly occur within the existing ROWs, and for Alternatives A, B, and C, including the variants, would involve replacing existing structures with a smaller number of taller structures. This would result in negligible impacts. Long-term adverse impacts to land use from the acquisition of new or expanded ROW would range from minor to moderate depending on the location and ownership of the acquired ROW. The majority of new or expanded ROW would be along the North Line. Acreages of new ROW where land use restrictions would apply are described in Section 4.11.5 below.

None of the alternatives would result in conflicts with adopted land use plans or policies. Those portions of the alignments located on National Forest System lands are within a designated utility corridor (USFS 2012a).

For all alternatives, implementation of SCPs 1 and 18 would minimize the effects of construction activities by limiting the movement of construction crews and equipment to the ROW, including access routes, and requiring that all waste materials from the construction areas and ROW that cannot be eliminated onsite, be removed, allowing disturbed areas to revert to previous land uses.

Short-term adverse impacts to land use as a result of construction activities would occur from temporary interruption of typical existing activities due to the presence of heavy equipment and line stringing activities. Any loss of the use of agricultural land, such as grazing, during construction activities would be compensated. Short-term impacts would be minor to moderate and would be temporary, ending when construction would be completed. Long-term adverse impacts to land use would result from the inclusion of land use restrictions in ROW easements for new or expanded ROWs, to prevent incompatible uses. Under Alternatives A, B, and C (including the variants), positive long-term impacts would result from the decommissioning of one of the two existing transmission lines, and subsequent return of ROW easements to landowners. These positive long-term impacts would not apply to Alternative D.

4.11.3.2 Recreation

Impacts to recreation could occur from establishment of new access roads, road improvements, or overland access depending on the location of these activities. Construction activities within a recreation area would result in adverse impacts from noise, visual disturbances and potential delays or temporary inability to reach a recreation destination. Short-term impacts to recreation could range from negligible to moderate depending on location and timing of construction activities. Adverse effects from noise associated with construction, such as helicopter activities, are anticipated to be minor and short-term, ending when construction terminates. New permanent access roads that are not designated for public use could become an attractive nuisance and lead to unauthorized off-highway vehicle (OHV) use and associated resource damage, noise, etc. The miles of new permanent access proposed on National Forest System land under each of the alternatives is summarized in Section 4.16, Transportation. Staging areas would not be located within developed recreation or concentrated use areas.

Operations and maintenance activities could cause negligible to minor adverse impacts to recreation access, opportunities, and experiences due to delays in accessing a recreation site, noise and visual disturbances, and disturbances to wildlife. These activities are already occurring but their distribution and frequency would change depending on the alternative implemented.

Impacts to recreation from general construction activities and staging areas would be short-term. Impacts from operations and maintenance would be short in duration, but would occur periodically over the long-term life of the Project. Impacts to recreation from access road building, improvements, overland access, and temporary access roads would be short-term. Impacts to recreation from permanent access roads would be long-term. It is assumed that temporary access roads would be restored and thus, there would be no long-term impacts from these roads.

4.11.4 No Action Alternative

Under the No Action Alternative, both existing transmission line ROWs would continue to be utilized and on-going maintenance activities as a result of an increase in failing structures would continue, possibly with increased frequency. The benefits to land use and recreation from decommissioning one of the lines would not be realized and maintenance activities would continue to impact recreational opportunities and experiences on the two separate ROWs. Existing ROWs would be expanded as needed and minor adjustments would be made to the alignments where necessary in order to comply with NERC and NESC requirements. At one location, specifically a segment through the Newell Lake View subdivision, the existing line would be relocated and a new ROW acquired due to the presence of several residences adjacent to the existing ROW.

4.11.4.1 Land Use

Under the No Action Alternative, impacts associated with land use would result from the acquisition of new ROW at selected locations. In order to comply with applicable standards and maintain an acceptable level of reliability, Western would acquire additional ROW at all locations on private land where the current ROW width is less than 75 feet, and depending on maintenance requirements, additional ROW may need to be acquired at some locations where the existing ROW width is less than 110 feet.

The South Line has a ROW width of 75 feet or more over its entire length. Conversely, the North Line has inadequate ROW width over nearly all of its entire length, the only exceptions being short segments near Mall Road in Estes Park and near the Flatiron Substation.

Where there is inadequate ROW on private land, Western would acquire the additional ROW needed to meet applicable standards. For much of the North Line, this would require acquisition of an additional 45 to 55 feet of ROW. At one location, specifically a segment through the Newell Lake View subdivision, the existing line would be relocated to follow Pole Hill Road near Pinewood Reservoir and a new ROW acquired due to the fact that several homes have built immediately adjacent to the existing transmission line ROW. The new line segment would parallel Pole Hill Road. Existing land uses would be disrupted by noise and activities involved with construction, but these impacts would cease once construction was completed. Western would retain its rights to the ROW through Newell Lake View subdivision following decommissioning of the existing line in order to maintain a single-pole fiber optic communications connection with Pinewood Dam. The overall effect on the Newell Lake View subdivision would be beneficial.

In total, 40 landowners would be burdened by ROW acquisition under the No Action Alternative, which would be required to meet current standards. Acquisition of new ROW would affect five landowners while ROW expansion would affect 35 landowners. Project activities in these areas may be viewed as adverse long-term impacts by some or all of the 40 landowners. Western would not seek authorization for new or expanded ROW on National Forest System land.

4.11.4.2 Recreation

Impacts to recreation from the No Action Alternative would result from new transmission line structures and general maintenance and replacement activities along the transmission line alignments and in areas where new ROW would be acquired. New transmission line structures would affect the recreation setting in a portion of Pinewood Reservoir County Park; however, these actions would involve replacing an existing transmission line and expansion of an existing ROW, which reduces the degree of change to the setting. See Section 4.12 for a discussion of visual impacts.

Additional clearing activities within any expanded ROWs would have a negligible to minor adverse impact on the recreation setting at recreation areas along the North Line where additional new ROW would be acquired in the Roosevelt National Forest, Ramsay-Shockey Open Space, and Chimney Hollow Open Space. Impacts to recreation from the new structures in the long term would be negligible as the new structures would consist of the same type of H-frame structures currently in place, and, with the exception of the Newel Lake View subdivision, would be replaced in the same locations.

4.11.5 Impacts Unique to Specific Action Alternatives

4.11.5.1 Land Use

Alternatives A, B, C, and D and Variants

Land Ownership

Private landowners make up the largest percentage of landownership along the action alternatives, followed by the USFS, Larimer County and SLB (**Table 4.11-1**).

Table 4.11-1 Comparison of Land Ownership Crossed

Alternative	Total Length (miles)	Within Existing ROW (miles)	Within New ROW (miles)	Land Ownership Crossed (miles)					
				County	SLB	NCWCD	USFS	DOI	Private/ Other
No Action	28.6	27.6	1	2.5	1	0.2	3.8	1.0	20.0
A	15.0	12.6	2.4	0.8	-	-	1.7	0.6	12.0
A1	15.1	11.4	3.7	0.6	-	-	1.7	0.6	12.0
A2	15.3	11.3	4.0	0.6	-	-	1.7	0.6	12.1
B	14.8	13.8	1.0	1.6	1	0.2	2.2	0.4	9.4
C	15.5	12.1	3.4	1.8	-	0.1	2.2	1.0	10.6
C1	15.7	11.7	4.0	1.8	-	0.1	2.2	1.0	10.6
D	28.6	27.6	1	2.5	1	0.2	3.8	1.0	20.0

SLB = State Land Board (Colorado), NCWCD = Northern Colorado Water Conservancy District, DOI = U.S. Department of Interior.

Protected Lands

Protected lands crossed by all action alternatives include the Flatiron Reservoir County Park and Chimney Hollow Open Space. Alternatives A, C, and D also cross the Pinewood Reservoir County Park and Ramsay Shockey Open Space, while Alternatives B and D would cross the Blue Mountain Bison Ranch and a SLB Stewardship Trust parcel. The adverse effects of crossing these protected areas would be minimized by the fact that they are already crossed by existing transmission lines that would be rebuilt using an existing or expanded ROW. None of the protected lands would be crossed at a location that required the acquisition of new ROW following a new alignment. Therefore, potential adverse impacts to protected lands would be negligible to minor and short-term.

Some alternatives would result in beneficial impacts to protected areas through the removal of an existing transmission line and decommissioning of the ROW. Specifically, Alternatives A and C would remove the South Line through the Blue Mountain Bison Ranch and Pinewood Reservoir Stewardship Trust property. Alternative C also would decommission the North Line where it crosses the Chimney Hollow Open Space. Alternative B would decommission the North Line where it crosses the Ramsay Shockey Open Space and Pinewood Reservoir County Park. At these locations, the existing ROW would be allowed to return to natural conditions, resulting in long-term beneficial effects to these properties. Among the action alternatives, only Alternative D would not result in beneficial impacts to protected areas due to the fact that it would maintain both existing lines in place.

ROW Expansion and New ROW Acquisition

The number of acres of land to be acquired for new or expanded ROWs under each of the action alternatives is estimated as follows: Alternative A (153 acres); Alternative B (42 acres); Alternative C (117 acres); and Alternative D (177 acres). However, these totals do not account for the fact that all action alternatives other than Alternative D would result in a substantial amount of ROW being abandoned through consolidation of the two existing lines. This is discussed further in the descriptions of each alternative below. None of the alternatives conflict with zoning or land use management plans.

Alternative A would deviate from the existing alignment at several locations, including a segment north of the Newell Lake View subdivision, a new segment connecting to the Pole Hill Substation, and a segment at the far western end of the alternative where a new alignment near Mall Road is proposed to avoid a conflict with the Upper Thompson Sanitation District wastewater treatment plant. The amount of new and expanded ROW required for Alternative A is 153 acres, which accounts for both new segments of the alignment where a new ROW would be acquired as well as expansion of the existing ROW to a width of 110 feet from the 30-foot width that presently exists at most locations. In total, 46 landowners would be burdened by ROW acquisition under Alternative A. Acquisition of new ROW would affect 8 landowners while ROW expansion would affect 38 landowners. Project activities in these areas may be viewed as adverse long-term impacts by some or all of the 46 landowners. No existing residences would be directly affected by a new or expanded ROW and its associated restrictions.

Implementing Alternative A also would result in the removal of the existing South Line and the abandonment of its ROW, which varies in width from 75 to 130 feet. In total, approximately 150 acres of existing ROW would be abandoned, including segments through developed areas such as the Meadowdale Hills subdivision. Thirty-six landowners would have ROW decommissioned on their properties under Alternative A This would result in a beneficial long-term effect to the 36 property owners located along the alignment of the existing South Line.

Alternative B, which is typically located within an existing ROW with a present width of 75 to 130 feet, would require the acquisition of less new ROW than Alternative A: approximately 42 acres, some of which are located along a new alignment needed to connect the rebuilt line to the Pole Hill Substation. An expanded ROW would not be required through the Meadowdale Hills subdivision and no existing residences would be directly affected by a new or expanded ROW. Western would retain its rights to the ROW through Newell Lake View subdivision following decommissioning of the existing line in order to maintain a single-pole fiber optic communications connection with Pinewood Dam. In total, 19 landowners would be burdened by ROW acquisition under Alternative B. Acquisition of new ROW would affect four landowners while ROW expansion would affect 15 landowners. Project activities in these areas may be viewed as adverse long-term impacts by some or all of the 19 landowners. Similar to Alternative A, the existing ROW in Alternative B would be abandoned along one of the existing transmission lines, in this case the North Line. In total, approximately 50 acres of ROW would be abandoned along the existing North Line, including segments through developed areas such as the Park Hill and Newell Lake View subdivisions. Fifty-one landowners would have ROW decommissioned on their properties. This would likely be viewed as a beneficial long-term impact by the 51 landowners.

Alternative C would rebuild the transmission line on a single ROW using a combination of the existing North and South lines. New ROW would be required through Crocker Ranch on the western end of the Project; to connect to the Pole Hill Substation from the North Line; and for the re-route around and to the south of Newell Lake View subdivision. In total, Alternative C would require the acquisition of 117 acres of new or expanded ROW. Similar to Alternatives A and B, portions of the ROW along the existing lines would be abandoned. In total, approximately 139 acres of existing ROW would be abandoned. Thirty-six landowners would be burdened by ROW acquisition under Alternative C. Acquisition of new ROW would affect nine landowners while ROW expansion would affect 27 landowners. Project activities in these areas may be viewed as adverse long-term impacts by some or all of the 36 landowners. An expanded ROW would not be required through the Meadowdale Hills subdivision and no existing residences would be directly affected by a new or expanded ROW. Thirty-three landowners would have ROW decommissioned on their properties. This would likely be viewed as a beneficial long-term impact by the 33 landowners.

Alternative D would rebuild both existing lines, expanding the ROWs where needed. As a result, this alternative would require the greatest amount of new ROW, a total of 177 acres. Of this amount, the great majority would result from an expansion of the existing ROWs with only 1 mile of new alignment requiring additional ROW. Most of the new ROW is along the segment where the North Line would be relocated around and to the south of Newell Lake View subdivision, although Western would retain its rights to the ROW through Newell Lake View subdivision following decommissioning of the existing line in order to maintain a single-pole fiber optic communications connection with Pinewood Dam. Alternative D also would relocate one structure on the north side of the Upper Thompson Sanitation District parcel in Estes Park to accommodate expansion of their facility. No existing residences would be directly affected by either an expanded ROW or by the new ROW. Unlike the other action alternatives, Alternative D would result in the abandonment of very little existing ROW and this would be limited to the two short segments where the line would be relocated. In total, 40 landowners would be burdened by ROW acquisition under Alternative D. Acquisition of new ROW would affect 5 landowners while ROW expansion would affect 35 landowners. Project activities in these areas may be viewed as adverse long-term impacts by some or all of the 40 landowners. Unlike the other action alternatives, Alternative D would result in the abandonment of very little existing ROW and this would be limited to the two short segments where the line would be relocated. Seven landowners would have ROW decommissioned on their properties. This would likely be viewed as a beneficial long-term impact by the seven landowners.

Implementation of SCPs 1 and 18 would minimize the effects of construction activities by limiting the movement of construction crews and equipment to the ROW, including access routes, and requiring that all waste materials from the construction areas and ROW that cannot be eliminated onsite, be removed, allowing disturbed areas to revert to previous land uses.

Short-term adverse impacts to land use as a result of construction activities would occur from temporary interruption of activities due to the presence of heavy equipment and line stringing activities. Any loss of the use of agricultural land, such as grazing, during construction activities would be compensated. Short-term impacts would be minor to moderate and would be temporary, ending when construction would be completed. Long-term adverse impacts to land use would result from the inclusion of land use restrictions in ROW easements for new or expanded ROWs, to prevent incompatible uses. Under Alternatives A, B, and C positive long-term impacts would result from the decommissioning of one of the two existing transmission lines, and subsequent return of ROW easements to landowners. These positive long-term impacts would not apply to Alternative D.

Variant A1

Variant A1 would have similar impacts to those described for Alternative A. The only difference is an approximately 2-mile segment that would be located on a new alignment near the western edge of the Project area. Variant A1 would avoid most of the Park Hill subdivision and the Upper Thompson Sanitation District wastewater treatment plant by traversing Crocker Ranch on an alignment just south of the existing North Line and generally parallel to U.S. Highway 36. Approximately 28 acres of new ROW would be required for the new alignment, bringing the total amount of new ROW acquired under Variant A1 to 157 acres. The existing 30-foot ROW along the North Line would be abandoned west of the point where Variant A1 departs from the existing line. In total, 48 landowners would be burdened by ROW acquisition under Variant A1. Acquisition of new ROW would affect ten landowners while ROW expansion would affect 38 landowners. Project activities in these areas would likely be viewed as adverse long-term impacts by some or all of the 48 landowners. Thirty-six landowners would have ROW decommissioned on their properties. This would likely be viewed as a beneficial long-term impact by the 36 landowners.

Variant A2

The great majority (12.6 miles) of Variant A2 would be built aboveground and impacts for this segment would be the same as was described for Alternative A. The westernmost 2.7 miles of this alternative would be constructed underground following a new alignment generally located between the existing North Line and U.S. Highway 36. The longer duration and greater disturbance associated with construction of an underground transmission line would result in moderate, short-term impacts to residential and other uses in the Park Hill subdivision and vicinity. In the long term, Variant A2 would minimize conflicts with land use by burying the line along Mall Road through the developed area near Park Hill subdivision. However, the cables for the underground transmission lines would need to be replaced within 40 years of installation, resulting in subsequent short-term impacts. In total, approximately 152 acres of new ROW would be acquired under Variant A2. Forty-two landowners would be burdened by ROW acquisition under Variant A2. Acquisition of new ROW would affect 7 landowners while ROW expansion would affect 35 landowners. Project activities in these areas would likely be viewed as adverse long-term impacts by some or all of the 42 landowners. Thirty-six landowners would have ROW decommissioned on their properties. This would likely be viewed as a beneficial long-term impact by the 36 landowners.

Variant C1

The great majority (12.7 miles) of Variant C1 would be built aboveground and impacts for this segment would be the same as was described for Alternative C. The westernmost 2.7 miles of this alternative would be constructed underground following a new alignment. Variant C1, from Mall Road to the USFS boundary adjacent to the Meadowdale Hills subdivision, would be constructed underground. The longer duration and greater disturbance associated with construction of an underground transmission line would result in moderate, short-term impacts to residential and other uses in the Park Hill and Meadowdale Hills subdivisions and vicinity. In the long term, Variant C1 would minimize conflicts with land use by burying the line along Mall Road through the developed area near Park Hill subdivision and along the existing transmission line ROW through the Meadowdale Hills subdivision. However, the cables for the underground transmission lines would need to be replaced within 40 years of installation, resulting in subsequent short-term impacts. Burial of the transmission line would minimize conflicts with land uses adjacent to this variant. A total of approximately 110 acres of new ROW would be acquired under Variant C1. In total, 36 landowners would be burdened by ROW acquisition under Variant C1. Acquisition of new ROW would affect 9 landowners while ROW expansion would affect 27 landowners. Project activities in these areas would likely be viewed as adverse long-term impacts by some or all of the 36 landowners. Thirty-three landowners would have ROW decommissioned on their properties. This would likely be viewed as a beneficial long-term impact by the 33 landowners.

4.11.5.2 Recreation

Alternatives A, B, C, and D and Variants

Impacts to recreation from these action alternatives would result from establishing and improving access, removing existing transmission line facilities, installing new transmission structures, and general construction activities along the transmission line alignment. New, taller, less natural-looking (i.e., metal monopole) transmission line structures associated with Alternatives A and C would affect the recreation setting along the transmission line within the Roosevelt National Forest, Flatiron Reservoir County Park, Ramsay-Shockey Open Space, through a small portion of Pinewood Reservoir County Park, and through the northern tip of Chimney Hollow Open Space. Alternative B would rebuild the transmission line using steel monopole structures within the Roosevelt National Forest, Flatiron Reservoir County Park, Chimney Hollow Open Space, and Pinewood Reservoir Stewardship Trust. Rebuilding the transmission lines within existing ROW would have a minor adverse effect on the recreation setting due to increased structure height and the replacement of wood H-frame structures with steel monopoles, although the use of steel monopole structures would result in fewer structures used when compared to wood H-frame. Construction activities within the alignment would affect recreation opportunities on the Besant Point Trail within Pinewood Reservoir County Park, particularly if it occurred in the summer when recreation use is highest. Under Alternative C, new ROW would be acquired west of the Meadowdale Hills subdivision, where the transmission line would be moved away from but generally parallel U.S. Highway 36 to the intersection of U.S. Highway 36 and Mall Road. This new ROW would be intended to reduce visibility from U.S. Highway 36. The use of structures with a lower height and shorter span also would be considered along this segment to further reduce visibility, but this would result in an impact trade-off of more structures.

Adverse impacts to recreation from the altered setting would be minor as this is a transmission rebuild Project, and transmission structures, ROW, and access roads have been historically present.

The USFS ROS Users Guide (USFS 1982) details that powerline structures are included under the “Roaded Natural” ROS class. However, steel pole monopole structures associated with the proposed transmission line rebuild may result in a change from the “Roaded Natural” ROS class to ROS “Rural” if and where the structures would be placed adjacent to National Forest System roads. Should this change to the ROS classification occur, a Forest Service Plan Amendment would be required.

Alternatives A, B, and D propose either no improvements to USFS roads or limited reconditioning (blading) to remove ruts created by construction vehicles, while Alternatives A, B, C, and D would require new administrative road for permanent access on National Forest System lands (see Section 4.16.7). Alternative A proposes to leave the greatest length of USFS road unimproved (1.4 miles); limited reconditioning following construction would occur on up to 2.2 miles of USFS roads. Alternatives B and D would leave 0.4 mile of USFS road unimproved; limited reconditioning following construction would occur on up to 3.2 miles of USFS road. Alternatives A, B, and D would all leave a 0.4-mile four-wheel drive portion of West Pole Hill Road near the western boundary of the Roosevelt National Forest unimproved. Effects to the four-wheel drive/OHV recreation experience would be negligible under Alternative A, and minor under Alternatives B and D due to the greater length of road where reconditioning would be permitted.

Alternative C and Variant C1 would reconstruct sections of USFS Roads 122 (West Pole Hill Road) to allow for passage of semi-trailer trucks to structure locations. Under this alternative, grinding, chipping, or blasting could be used to level the grade on the west end of West Pole Hill Road. West Pole Hill Road would not be returned to its previous condition, resulting in increased recreational traffic and traffic speed after construction due to improved accessibility and user comfort. Reconstruction of the four-wheel drive section of West Pole Hill Road would improve access for recreational users accessing National Forest System lands for many dispersed recreational activities, such as hunting, dispersed camping, trail riding, hiking, mountain biking, and other motorized and non-motorized recreational uses. Some recreational users may identify improved access as a beneficial long-term effect, if it opens up National Forest System lands for their dispersed recreational use that were previously less accessible. Other National Forest System lands users may identify improved access as an adverse long-term effect. These adverse effects to the recreational experience would occur from more contact with other recreational users, increased impairment of the visual setting, potential degradation of the dispersed camping experience, potential noxious vegetation introductions, higher vehicular speed, the potential for more trash and damage to public property from increased recreational use, and increased fire risk. These adverse effects would be attributed to an influx of recreational user traffic resulting from easier two-wheel and four-wheel drive access to National Forest System lands. Whether beneficial or adverse, the effect on

National Forest System lands would be expected to be readily apparent and measurable and, therefore, of moderate intensity.

West Pole Hill Road (USFS Road 122) is one of the most popular four-wheel drive roads in the Estes Park area. There are limited four-wheel drive/OHV opportunities in the Estes Park area resulting in high demand for this particular road. Four-wheel drive use on USFS Road 122 ranges from moderate to high in the summer months. Due to its popularity with four-wheel drive users, a USFS private permittee has adopted USFS Road 122 and assists with annual maintenance. The permittee runs tours in the West Pole Hill Road area and has authorized permanent facilities (observation tower, picnic shelter with cooking facilities, toilet/washing/generator building, storage building) at the top of Panorama Peak. Tours are conducted in-part on National Forest System lands and are advertised as four-wheel drive tours with the most challenging four-wheel drive section of the entire route being the steep, rocky section just east of the road closure gate on West Pole Hill Road. Alternatives C and C1 would level the four-wheel drive section of West Pole Hill Road, removing the best and most challenging terrain for all four-wheel drive users. This adverse effect on four-wheel drive recreation would be significant on both a short-term and long-term basis. Because of this, these alternatives would have greater impacts to existing four-wheel drive recreation than other alternatives, including the APA.

Removal of transmission line facilities would result in temporary, minor adverse impacts to recreation opportunities and experiences due to possible delays in accessing a site, noise and visual disturbances to the recreation setting, surface disturbance that results in vegetation removal and bare ground, and disturbance to wildlife. However, beneficial impacts to the recreation setting also would occur due to line decommissioning under Alternatives A, B, and C, and allowing the decommissioned corridor to revegetate back to natural conditions. Under Alternatives A and C, the South Line would be removed from ROW crossing the Blue Mountain Bison Ranch and Pinewood Reservoir Stewardship Trust, and the ROW would be allowed to return to natural conditions, resulting in long-term beneficial effects to those properties. Alternative C also would decommission the North Line where it crosses the Chimney Hollow Open Space. Alternative B would decommission the North Line where it crosses the Ramsay Shockey Open Space and Pinewood Reservoir County Park. Alternatives A, B, and C would all decommission one of the existing transmission lines and 0.2 to 0.3 mile of existing access on the Roosevelt National Forest, thus enhancing recreation experiences for visitors to these areas.

General construction activities associated with building a new double circuit line would adversely but temporarily affect recreation opportunities and experiences within the Roosevelt National Forest, Flatiron Reservoir County Park, Ramsay-Shockey Open Space, Pinewood Reservoir County Park, Chimney Hollow Open Space, and Pinewood Reservoir Stewardship Trust. Minor adverse impacts to recreation opportunities and experiences may occur due to delays in accessing a site, noise and visual disturbances to the recreation setting, and disturbances to wildlife. At this time, Chimney Hollow Open Space is not open to the public although public tours were offered in 2012. Hunting use also would be adversely affected along West Pole Hill Road; however, other portions of Game Management Unit 20 would be available for hunting during construction. Alternate locations for recreation activities within the Roosevelt National Forest would be available during construction for any displaced users.

Construction and operation of the transmission line along a new alignment around the Newell Lake View subdivision and to the Pole Hill Substation should not adversely affect recreation areas or opportunities.

Impacts to recreation from the new steel monopole structures would be adverse and long-term as the recreation setting would be permanently altered by the visual impact of the taller structures. However, this impact would be moderated by the fact that in most places the new double circuit line replaces an existing line within existing ROW while decommissioning the other line and abandoning the ROW for most alternatives. Adverse impacts to recreation from the removal of structures would be short-term, while beneficial impacts to recreation from abandoning a ROW and letting the abandoned ROW revert to natural conditions would be long-term. Adverse impacts to recreation from general construction activities would be short-term.

<u>Variant A1</u>

The alignment for Variant A1 differs from Alternative A on the western end of the Project area only. Both Alternative A and Variant A1 cross the western end of the Project area on privately held land without public recreation opportunities. Therefore, the impacts of Variant A1 on recreation would be the same as described for Alternative A.

<u>Variant A2</u>

The alignment for Variant A2 differs from Alternative A on the western end of the Project area only. Both Alternative A and Variant A2 cross the western end of the Project area on privately held land without public recreation opportunities. Therefore, the impacts of Variant A1 on recreation would be the same as described for Alternative A.

<u>Variant C1</u>

The alignment for Variant C1 differs from Alternative C on the western end of the Project area only. Both Alternative C and Variant C1 cross the western end of the Project area on privately held land without public recreation opportunities. Therefore the impacts of Variant C1 on recreation would be similar to impacts described for Alternative C. One notable difference would be impacts to the recreation setting at the entrance to National Forest System lands east of Meadowdale Hills subdivision. The transmission line would be constructed underground up to this point with beneficial effects to the recreational setting at the entrance to National Forest System land. However, this benefit would be offset by the requirement for two transition structures (that would be approximately 100 feet tall and 5 feet wide at the base) where the line would change from underground to overhead construction.

4.11.6 Mitigation

After implementing SCPs 1 and 18 described in Section 2.5, there would be no significant impacts to land use in terms of conflicts with land use plans, zoning or with special management areas. Western will coordinate with the USFS to identify access spur roads that should be gated to discourage the creation of unauthorized user-created trails on National Forest System lands, and also will coordinate with the USFS to block access on access spur roads where the ROW has been decommissioned and allowed to revert to natural conditions. Impacts to four-wheel drive recreation on West Pole Hill Road under Alternative C and Variant C1 would be Residual Impacts, and are discussed below.

4.11.7 Residual Impacts

Residual effects would consist of temporary disruption of land uses and recreational activities by construction activities. Direct impacts associated with construction activities, such as potential access delays and disruption to land uses and the recreational setting, are expected to be adverse, but short-term and minor in intensity, ending when construction activities cease. Direct adverse impacts from the acquisition of ROW and subsequent restriction of landowner use and rights would be long-term and moderate in intensity. Western’s approach to acquiring land access is detailed in Section 2.3.1.

Alternative D would rebuild the transmission line on both ROWs, and has the greatest requirement for new ROW acquisition (177 acres), followed by Variant A1 (157 acres), Alternative A (153 acres), Variant A2 (152 acres), Alternative C (117 acres), Variant C1 (110 acres), and Alternative B (42 acres). Acres of ROW to be authorized on National Forest System land for each alternative is as follows: 55 acres (Alternative D); 31 acres (Alternatives B, C, and C1); and 23 acres (Alternatives A, A1, and A2). Acres of ROW to be decommissioned under each of the alternatives are as follows: Alternative A (143 acres), Variant A1 (151acres), Variant A2 (150 acres), Alternative B (42), Alternative C (139 acres), Variant C1 (143 acres), and Alternative D (4 acres). Seven parcels identified as protected lands are crossed by the Project alternatives. Alternative D crosses all seven of the parcels, compared to five parcels being crossed by Alternative B, and four parcels being crossed by Alternatives A and C.

Long-term adverse impacts to the recreational setting from the taller steel structures for Alternatives A, B, and C, or the variants, would be minor to moderate; however, under all alternatives except for Alternative D and No Action, there also would be long-term beneficial minor to moderate recreational and land use impacts due to ROW consolidation and decommissioning. Alternative C and Variant C1 would have significant short- and long-term impacts to four-wheel drive recreation on National Forest System land, due to reconstruction of West Pole Hill Road.

All action alternatives are compatible with existing land use plans and policies and USFS ROS classifications, and avoid adverse effects to the Upper Thompson Sanitation District.

4.11.8 Irreversible and Irretrievable Commitment of Resources

It is anticipated that there would be no irreversible or irretrievable commitment of resources associated with the action alternatives.

4.11.9 Relationship Between Short-term Uses and Long-term Productivity

Recreational and land use access may be temporarily disrupted during construction activities, particularly along portions of Pole Hill Road; however, in the long term access would be restored. Long-term productivity also would be enhanced in areas where existing transmission line would be removed.

4.12 Visual Resources

This section provides an assessment of the direct and indirect potential impacts to visual resources from the construction and operation of the proposed project. The impacts study area, impact assessment methodology, scoping issues, and significance criteria are summarized below, followed by the potential impacts of the proposed project.

4.12.1 Methodology

The direct, indirect, and cumulative visual resources analysis area is the visible area (viewshed) affected by the project and surrounding lands. Visual effects resulting from the removal of the existing single-circuit 115-kV lines and the installation of new 115-kV line structures would be most pronounced within the 0.5 mile (the foreground distance zone) though individual transmission facilities can be seen by the unaided eye at miles from the project (outer extent of the middleground distance zone) where not screened. Beyond 4 miles, individual facilities are generally difficult to discern. Landscape changes, such as a maintained ROW, may be discernible up to 12 miles away during optimal viewing conditions.

The analysis area encompasses major roadways, recreation sites, protected areas, mountain communities and neighborhoods whose tourism economy and quality of life are based in large measure on scenic quality. The area is a popular destination for developed and dispersed recreational opportunities with residents and draws visitors from the surrounding region and world-wide. Recreational uses and land uses in the area are described in Section 3.11. Key Issues of concern, as presented in Section 1.6.4.1, include:

- Visual impacts to scenic travel corridors (e.g., U.S. Highway 36), residential areas, rural aesthetics, and recreational viewsheds in the vicinity of Estes Park, Rocky Mountain National Park, Meadowdale Hills and Newell Lake View subdivisions, and National Forest System land.

Other issues of concern include:

- Visual impacts from a new 115-kV double-circuit transmission line compared to two 115-kV single-circuit transmission lines.
- Visual benefits of removing old power lines.
- Visual effects of underground versus overhead transmission lines.

- Potential noncompliance with the USFS Forest Plan SIO of "Moderate" on National Forest System lands.

As a cooperating agency under NEPA, the USFS provided guidance on the scope of analysis and methodology for visual resources (USFS 2013). Short- and long-term visual impacts were assessed qualitatively utilizing public and agency scoping, field observations, construction design details, viewshed analyses, photographic simulations (see **Appendix C**), sections and elevations, and KOPs per the USFS's SMS process and significance criteria, as described below. The analysis includes a comparison of the alternatives compatibility with the USFS's SIOs.

4.12.1.1 Computer-generated Photographic Simulations

From the total list of KOPs, representative sites (primarily those representing locations with high viewer sensitivity and high potential for visual impacts to existing visual resources) were selected for development of photographic simulations, or photo-realistic renderings, in consultation with the USFS and in response to scoping comments. Visual simulations are an important tool in estimating the degree of visual change each alternative may cause to landscape scenery as seen from travel ways and use areas, taking into consideration viewing distance, angle of view, season, time of day, and the type of project changes proposed. The simulations provide documentation regarding both adverse and beneficial structure contrasts and landscape contrasts, which are expected to occur with project implementation.

Visual simulations of the project are presented in **Appendix C**, and are based on Western's SCPs, project-specific design criteria described in Chapter 2.0, and preliminary engineering. All simulations simulate the removal of the existing transmission lines, installing a double-circuit 115-kV transmission line, and implementing proposed vegetation management practices within the expanded ROW. New or improved access roads were not simulated since the exact locations would not be determined until the design phase for the proposed project. In most case, existing roads or overland travel would be utilized, except for currently inaccessible areas with steep slopes.

The simulations are fundamentally similar: all simulations for Alternatives A, B, and C and the variants show an average structure height of 105 feet for the new double double-circuit 115-kV transmission line structures and long-term vegetation management of the ROW (except where noted in **Appendix C**). No simulations for Alternative D were included since new H-frame wood-pole structures would be similar to the existing wood-pole structures. The degree and type of vegetation cover that might be expected to recover over the short term was estimated by comparing before and after photographs of ROW vegetation treatments completed in 2009. Sample photographs showing ROW vegetation management are contained in **Appendix C**. Simulation methods and metadata for each KOP (photograph date, time, coordinates, camera model, focal lens length) can be found in **Appendix C**.

4.12.1.2 Key Observation Point Analyses

Beneficial and adverse effects from each alternative by KOP are described in **Table 4.12-1** with respect to landscape character, scenic attractiveness and existing scenic integrity.

4.12.1.3 Viewshed Analyses

Viewshed analyses for each alternative were conducted using a geographic information system to quantify the number of transmission structures that would be visible within the analysis area (see **Figures 4.12-1** through **4.12-8**). Traditional viewshed analyses rely on a 10-meter (or about 33 feet) digital elevation model and do not take into account the screening effect of vegetation; they are a "bare-ground" scenario of views limited solely by terrain. To better represent existing tree screening, 35-foot-tall trees were incorporated into the viewshed analyses at a conservative height using the ESRI BUMP mapping tool (Nighbert 2010). As described in Section 4.7, the proposed project crosses two types of timber stands: Mixed Conifer forests on north facing slopes, and Ponderosa Pine woodlands on

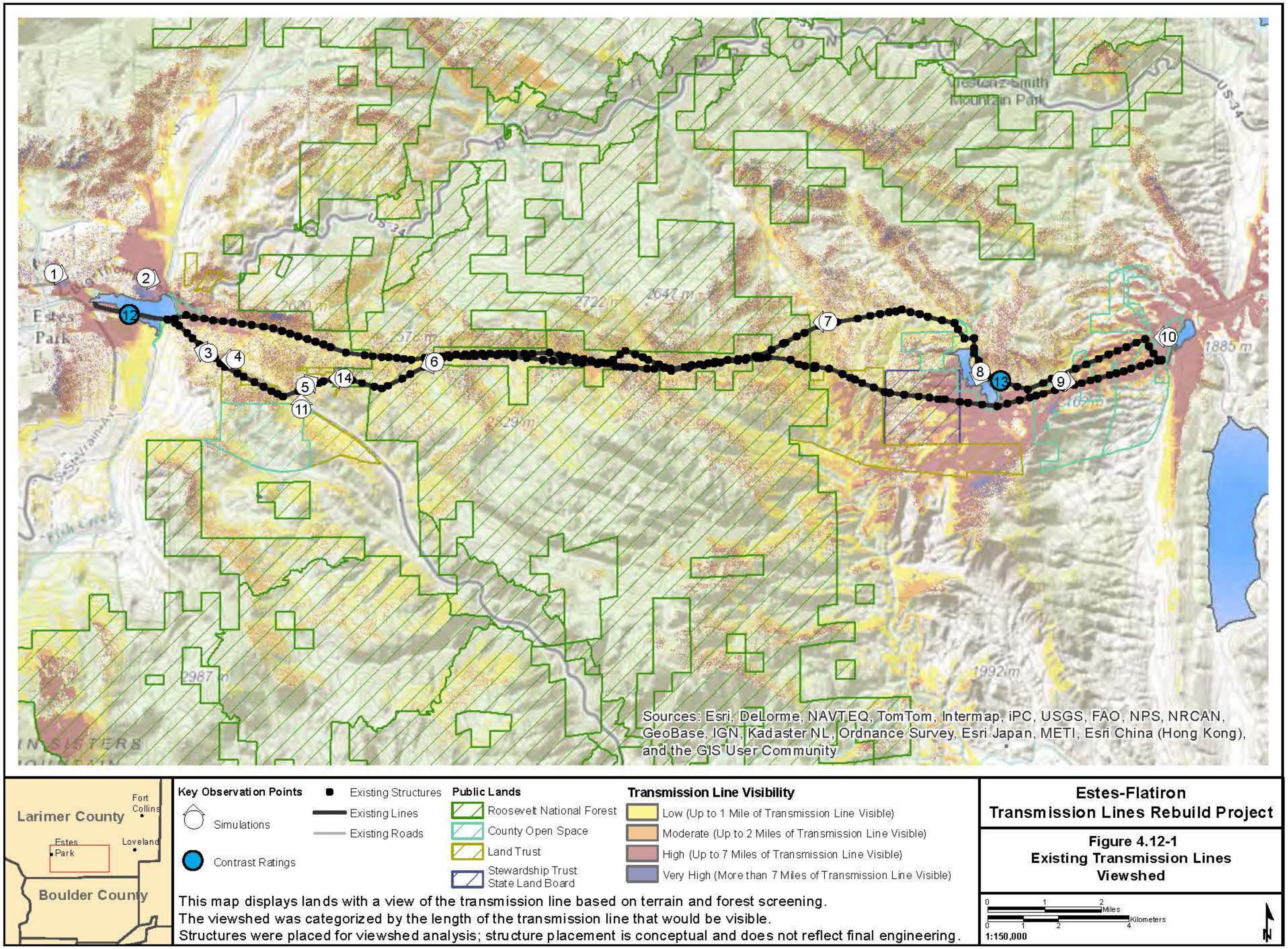


Figure 4.12-1
Existing Transmission Lines Viewshed

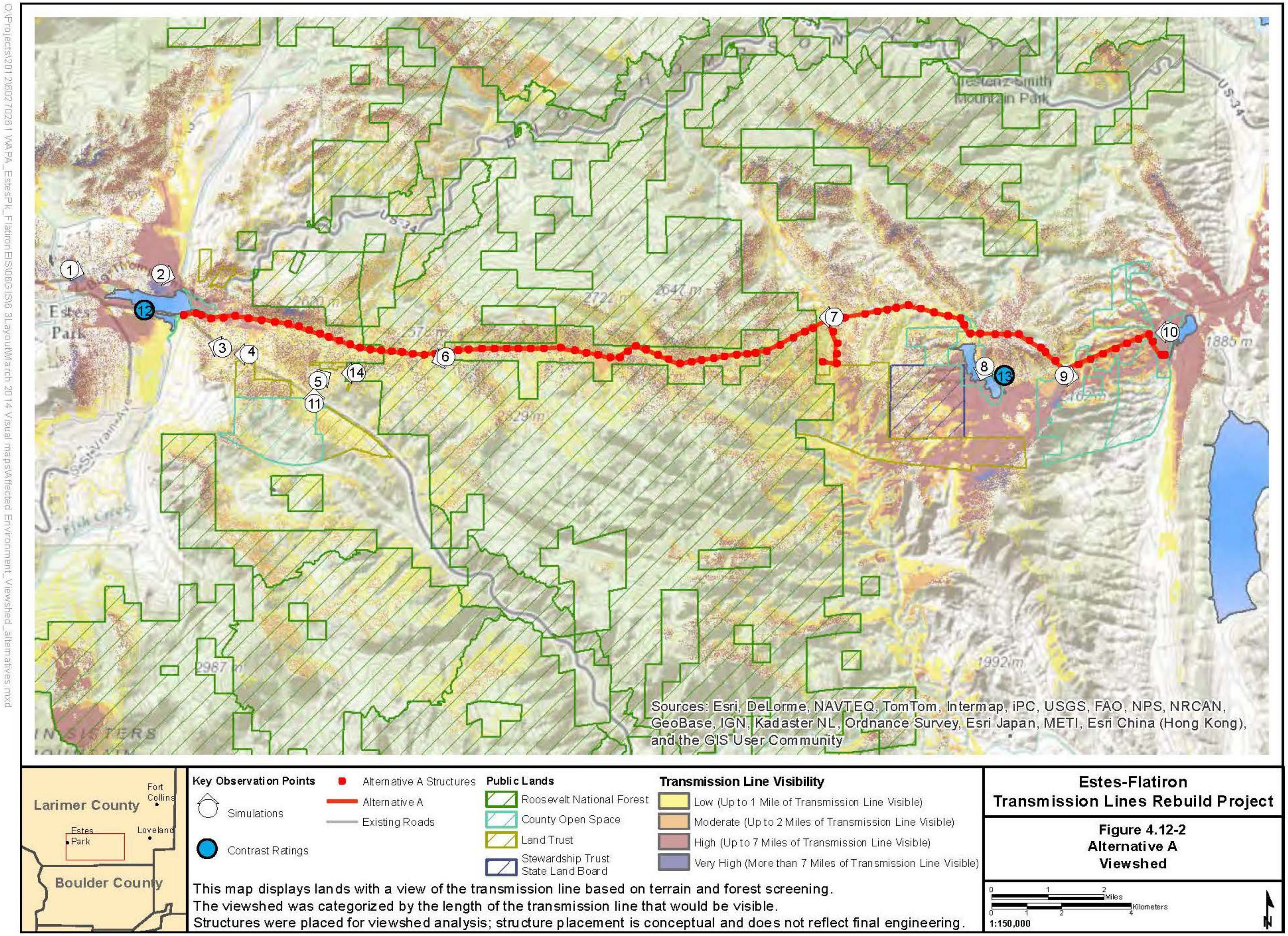
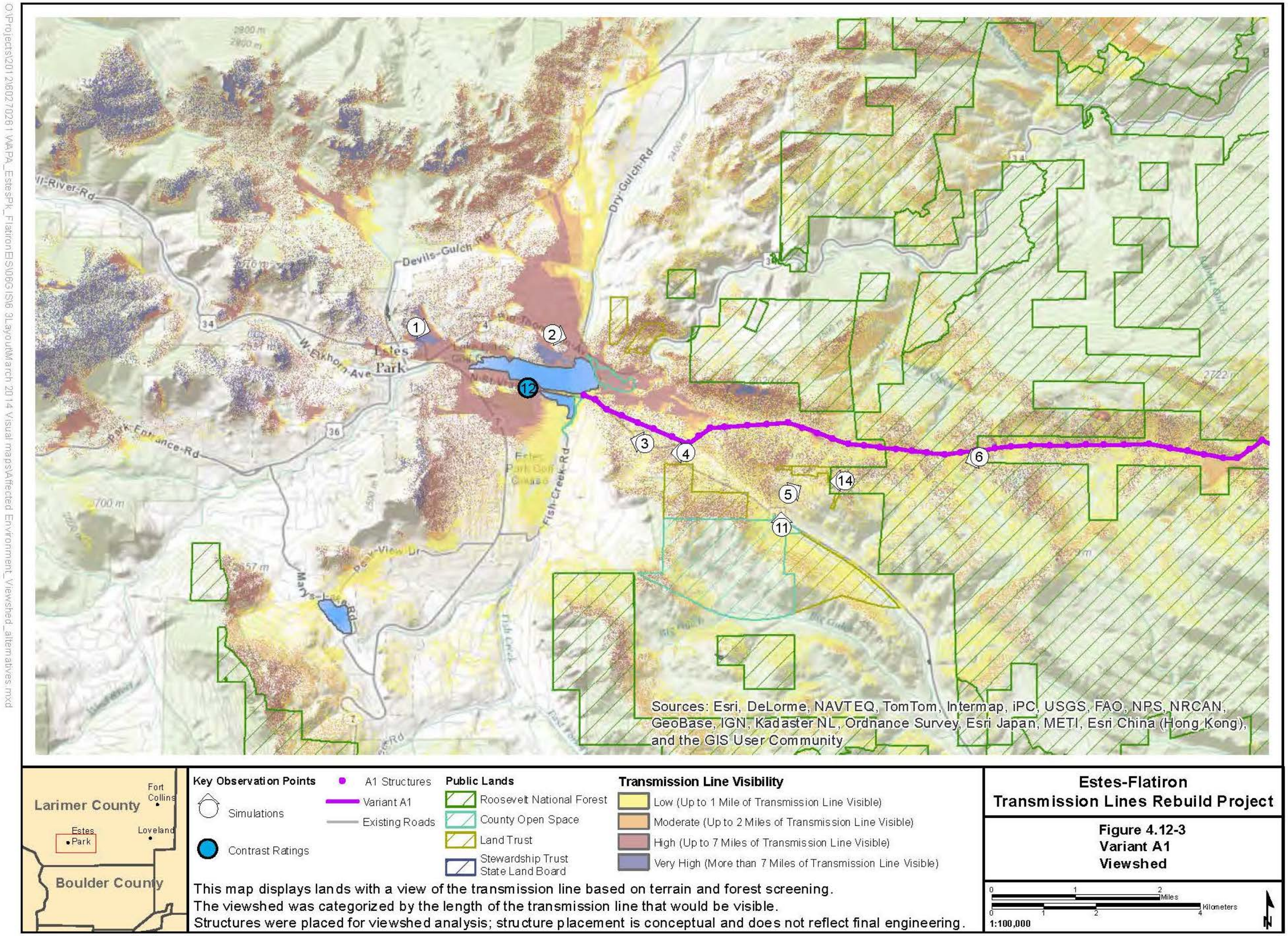


Figure 4.12-2
Alternative A
Viewshed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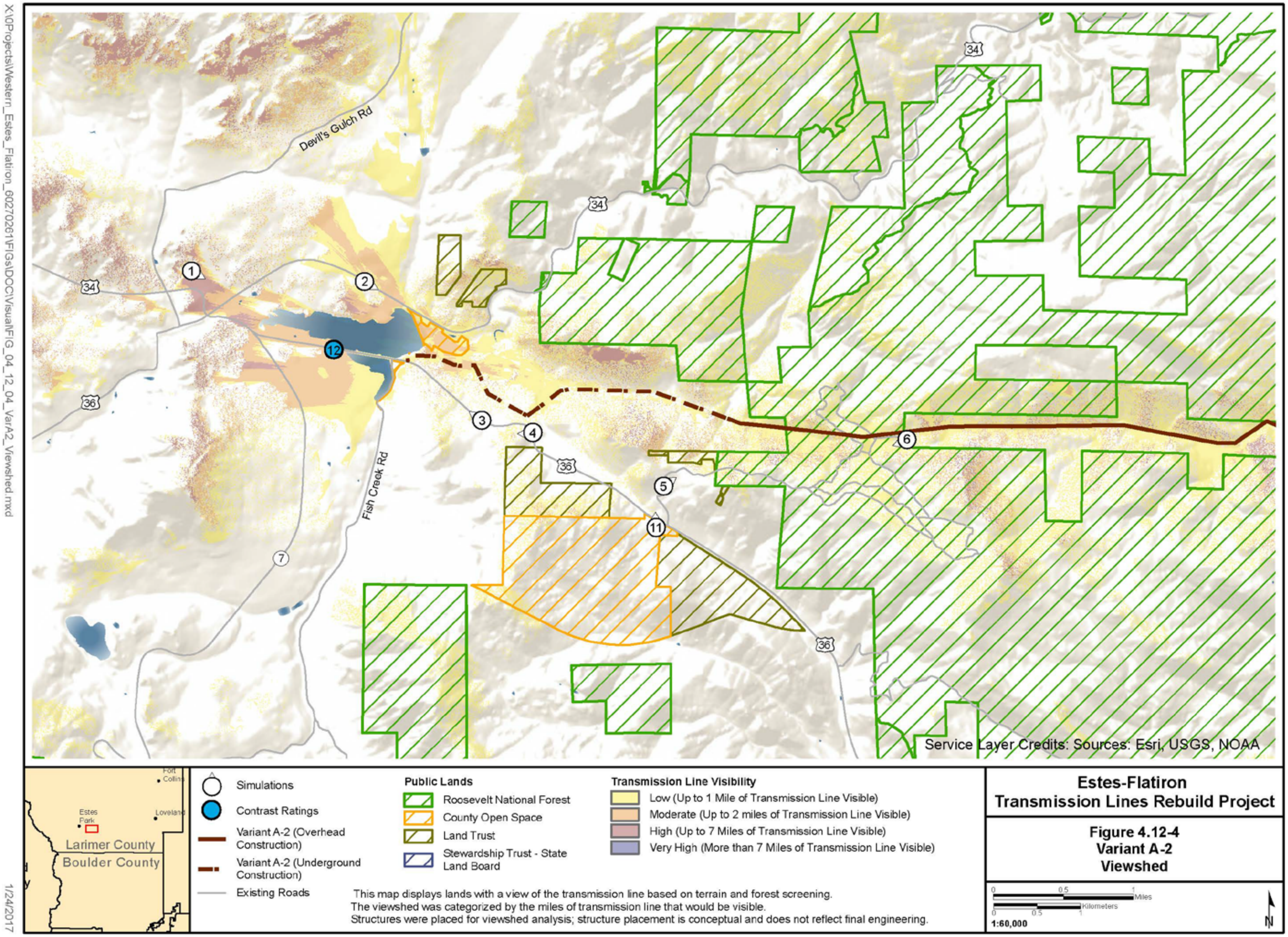
Estes Park
W-Elkhorn-Ave
Devils-Gulch-Rd
Dry-Gulch-Rd
Park-Entrance-Rd
Fish-Creek-Rd
Marys-Lake-Rd
Estes Park Golf Course
Sources: Esri, DeLorme, NAVTEQ, TomTom, Intermap, iPC, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), and the GIS User Community
Larimer County
Fort Collins
Estes Park
Loveland
Boulder County
Key Observation Points
Simulations
Contrast Ratings
A1 Structures
Variant A1
Existing Roads
Public Lands
Roosevelt National Forest
County Open Space
Land Trust
Stewardship Trust State Land Board
Transmission Line Visibility
Low (Up to 1 Mile of Transmission Line Visible)
Moderate (Up to 2 Miles of Transmission Line Visible)
High (Up to 7 Miles of Transmission Line Visible)
Very High (More than 7 Miles of Transmission Line Visible)
This map displays lands with a view of the transmission line based on terrain and forest screening.
The viewshed was categorized by the length of the transmission line that would be visible.
Structures were placed for viewshed analysis; structure placement is conceptual and does not reflect final engineering.
Estes-Flatiron
Transmission Lines Rebuild Project
Figure 4.12-3
Variant A1
Viewshed
Miles
Kilometers
1:100,000



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Devil's Gulch Rd
Fish Creek Rd
Service Layer Credits: Sources: Esri, USGS, NOAA
Larimer County
Boulder County
Estes Park
Loveland
Simulations
Contrast Ratings
Variant A-2 (Overhead Construction)
Variant A-2 (Underground Construction)
Existing Roads
Public Lands
Roosevelt National Forest
County Open Space
Land Trust
Stewardship Trust - State Land Board
Transmission Line Visibility
Low (Up to 1 Mile of Transmission Line Visible)
Moderate (Up to 2 miles of Transmission Line Visible)
High (Up to 7 Miles of Transmission Line Visible)
Very High (More than 7 Miles of Transmission Line Visible)
This map displays lands with a view of the transmission line based on terrain and forest screening.
The viewshed was categorized by the miles of transmission line that would be visible.
Structures were placed for viewshed analysis; structure placement is conceptual and does not reflect final engineering.
Estes-Flatiron Transmission Lines Rebuild Project
Figure 4.12-4
Variant A-2
Viewshed
Miles
Kilometers
1:60,000
1/24/2017

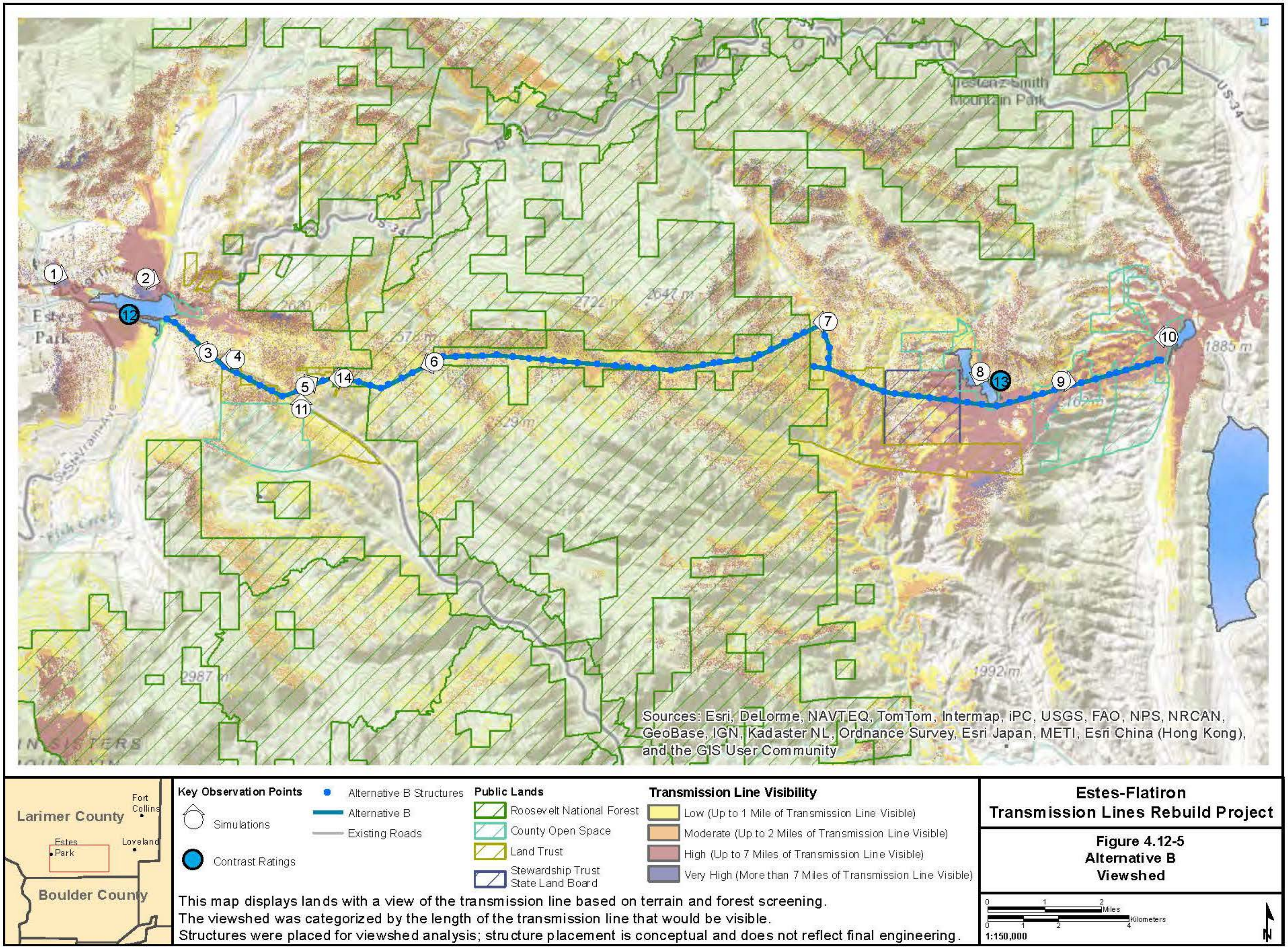
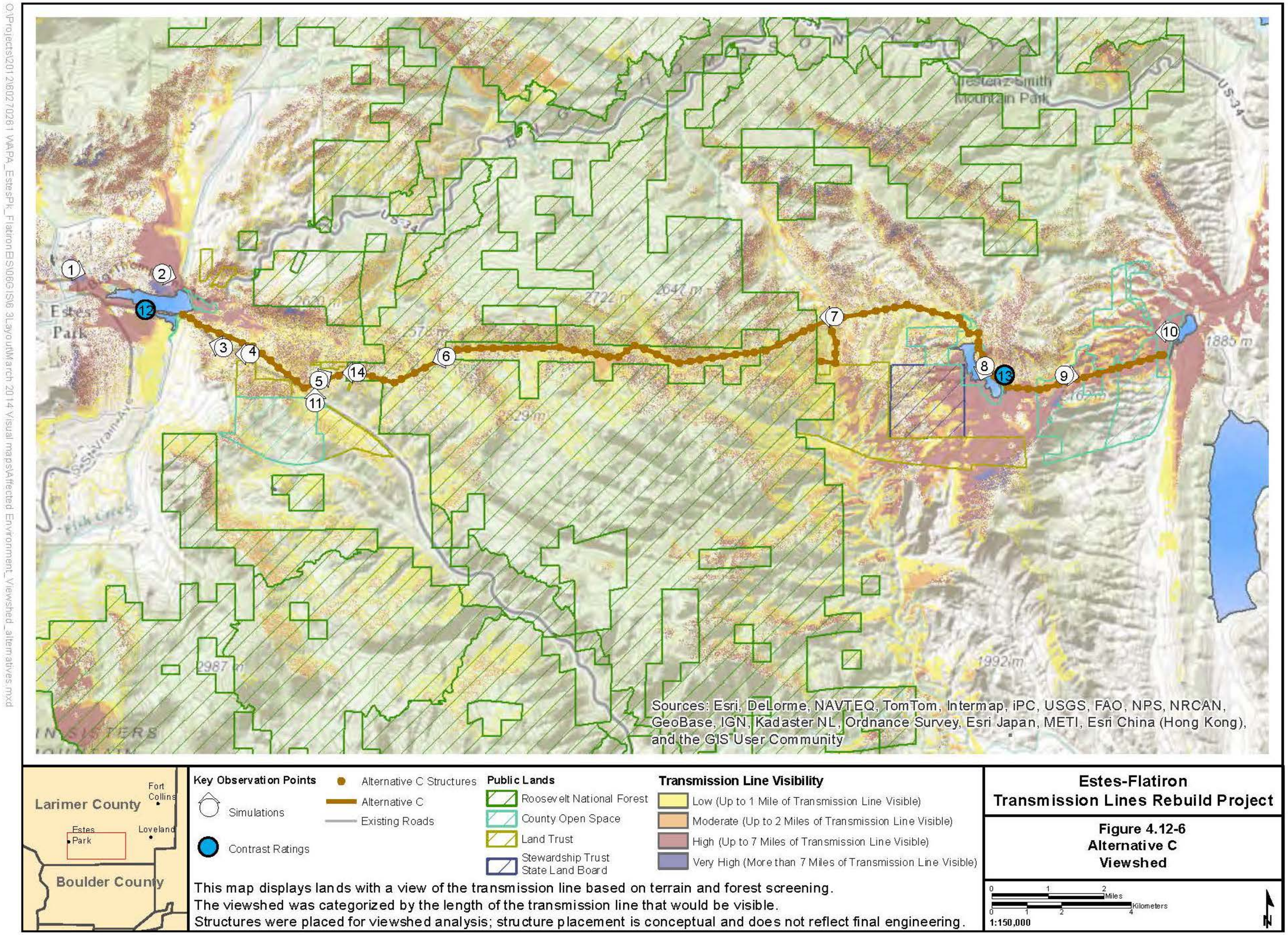


Figure 4.12-5
Alternative B
Viewshed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Estes Park
US-34
US-34
Sources: Esri, DeLorme, NAVTEQ, TomTom, Intermap, iPC, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), and the GIS User Community
Larimer County
Fort Collins
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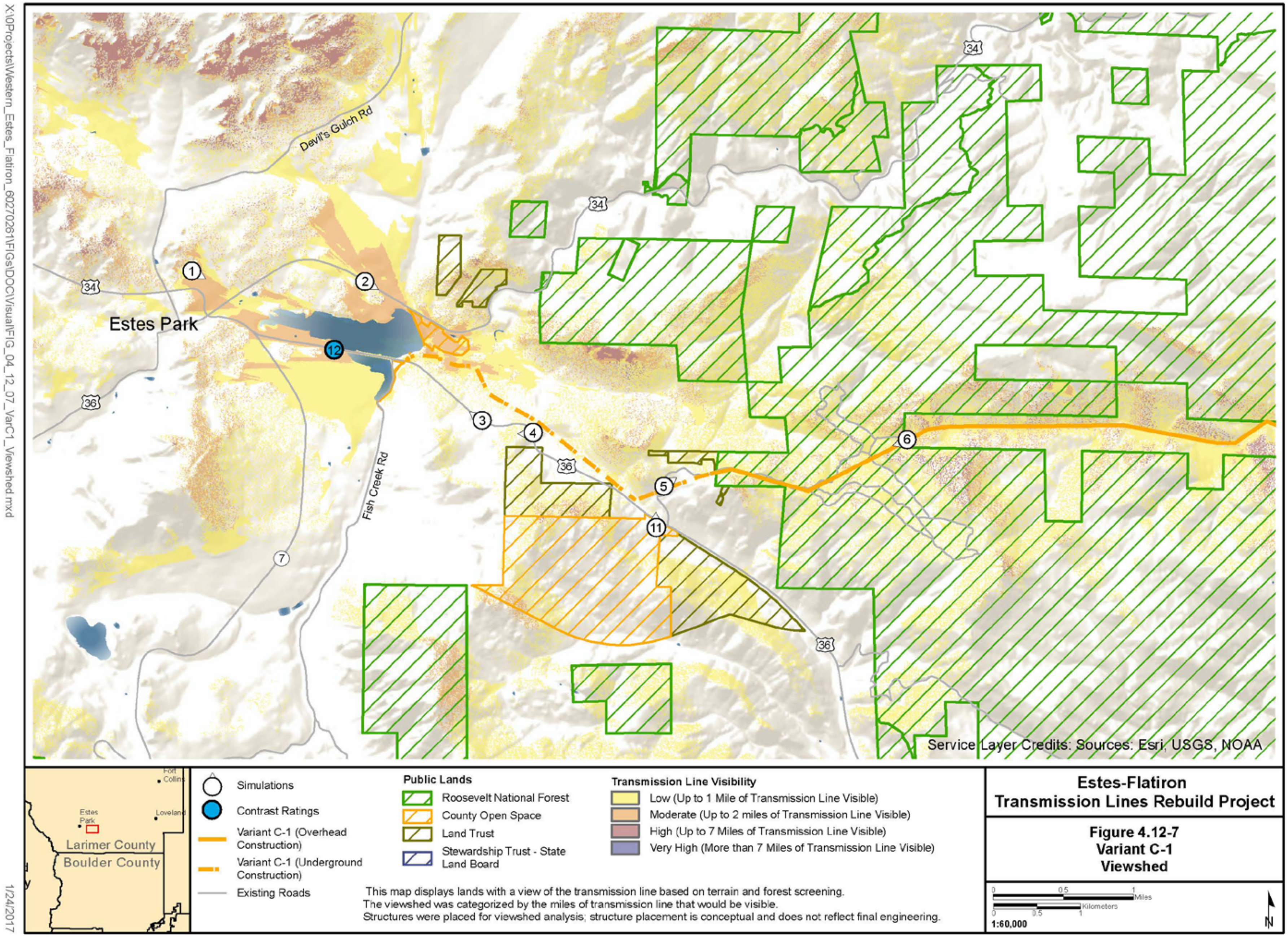
Key Observation Points
Simulations
Contrast Ratings
Alternative C Structures
Alternative C
Existing Roads
Public Lands
Roosevelt National Forest
County Open Space
Land Trust
Stewardship Trust State Land Board
Transmission Line Visibility
Low (Up to 1 Mile of Transmission Line Visible)
Moderate (Up to 2 Miles of Transmission Line Visible)
High (Up to 7 Miles of Transmission Line Visible)
Very High (More than 7 Miles of Transmission Line Visible)
This map displays lands with a view of the transmission line based on terrain and forest screening.
The viewshed was categorized by the length of the transmission line that would be visible.
Structures were placed for viewshed analysis; structure placement is conceptual and does not reflect final engineering.
Estes-Flatiron Transmission Lines Rebuild Project
Figure 4.12-6
Alternative C
Viewshed
Miles
Kilometers
1:150,000
N


Estes Park
Devil's Gulch Rd
Fish Creek Rd
34
36
7
1
2
3
4
5
6
11
12
Service Layer Credits: Sources: Esri, USGS, NOAA
Fort Collins
Estes Park
Loveland
Larimer County
Boulder County
Simulations
Contrast Ratings
Variant C-1 (Overhead Construction)
Variant C-1 (Underground Construction)
Existing Roads
Public Lands
Roosevelt National Forest
County Open Space
Land Trust
Stewardship Trust - State Land Board
Transmission Line Visibility
Low (Up to 1 Mile of Transmission Line Visible)
Moderate (Up to 2 miles of Transmission Line Visible)
High (Up to 7 Miles of Transmission Line Visible)
Very High (More than 7 Miles of Transmission Line Visible)
This map displays lands with a view of the transmission line based on terrain and forest screening.
The viewshed was categorized by the miles of transmission line that would be visible.
Structures were placed for viewshed analysis; structure placement is conceptual and does not reflect final engineering.
Estes-Flatiron
Transmission Lines Rebuild Project
Figure 4.12-7
Variant C-1
Viewshed
Miles
Kilometers
1:60,000
N
X:\0Projects\Western_Estes_Flatiron_60270261\FIGs\DOC\Visual\FIG_04_12_07_VarC1_Viewshed.mxd
1/24/2017

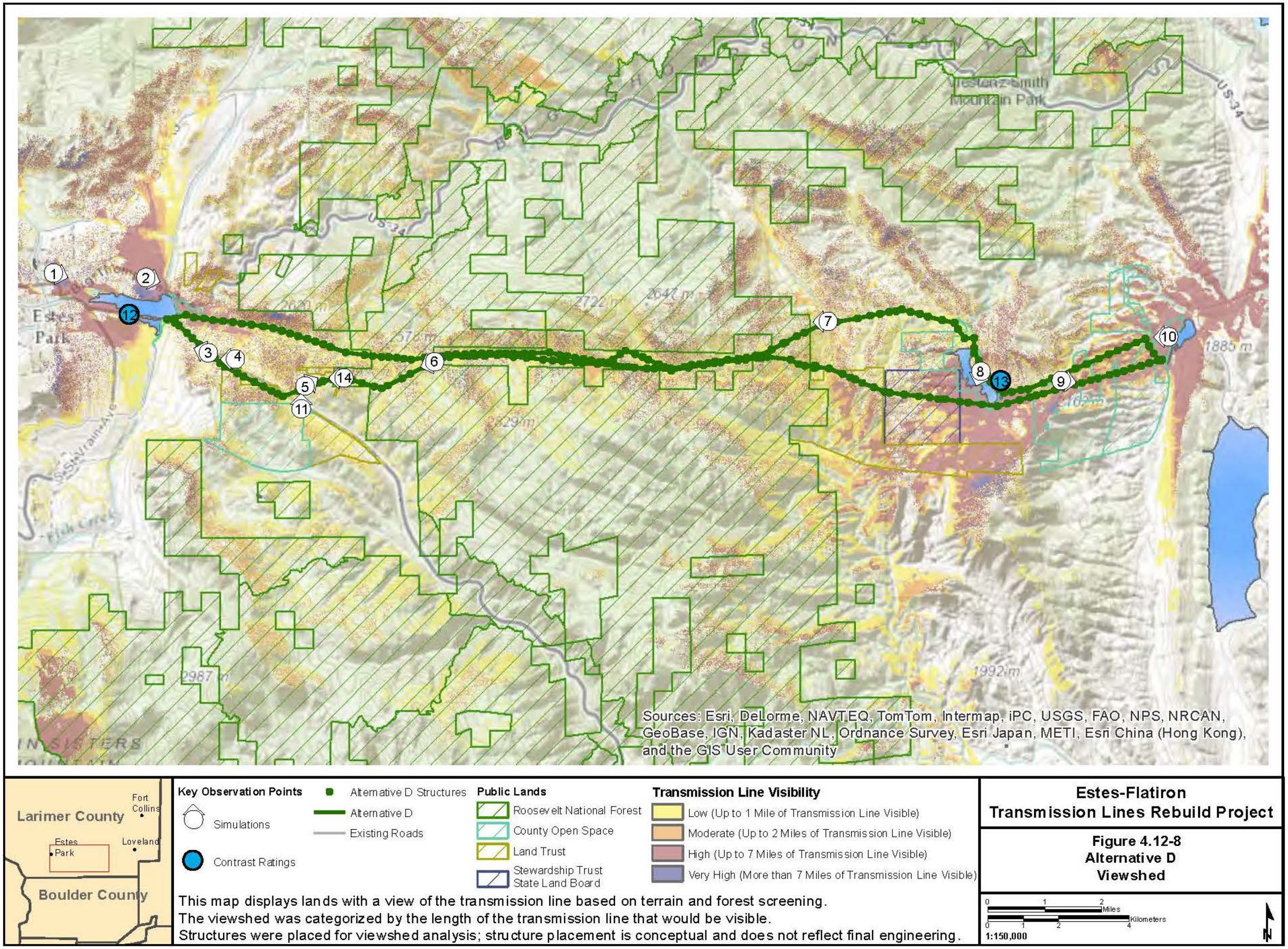


Figure 4.12-8
Alternative D
Viewshed

south, east, and west-facing slopes. An average stand density was determined by analyzing aerial photography. Timber stand data from SWReGAP was converted to a random 35-foot-tall cone pattern based on the average stand density and added to the 10-meter digital elevation model. The resulting viewshed analyses show the number of poles that would be visible from a particular location accounting for timber screening.

The No Action Alternative and Alternative D were modeled at 65 feet high. Alternatives A, B, and C and the overhead portions of Variants A1, A2, and C1 were modeled at 105 feet high, the average anticipated height. Viewshed analyses are one indicator of visual impact, however, they do not take into account viewer sensitivity, scenic quality, scenic integrity, or the degree of change over distance (i.e., visual contrast decreases substantially as distance from the project increases).

4.12.1.4 Field Observations

The impact analysis takes into account differences between photographic simulations, viewshed analyses and the actual appearance of a transmission line in the landscape. Photographic simulations cannot depict 360-degree views and ever-changing environmental conditions. The human eye sees differently than a camera lens: human vision is binocular and dynamic, compared to a camera that tends to flatten an image. A photographic simulation portrays a single atmospheric, lighting, and seasonal condition. Field observations of comparable Western and Platte River Power Authority 115-kV double-circuit overhead steel monopole and underground projects in the Fort Collins, and Loveland, Colorado area in 2012 aided in preparing a comprehensive evaluation.

4.12.1.5 Compliance with Management Objectives

Where alternatives cross National Forest System lands, the predicted structure and landscape contrasts and impacts to viewers were compared to Forest Plan management objectives and standards for that area. Forest Plan objectives and standards are designed to maintain a specific visual experience, and are used to determine whether alternatives are within or exceed the allowable degree of visual change for the area. The SIO that would result from implementation of each of the alternatives on National Forest System land is compared to the existing SIO of Moderate.

4.12.1.6 Assumptions

The following assumptions were used in the impacts analysis for visual resources:

- All action alternatives would result in visual change to the area because aboveground facilities and surface disturbance would be visible from some location, however remote.
- Viewshed impacts to the recreational experience are of a visual nature; they are, therefore, addressed in the visual resource section.
- Visual impacts to context-sensitive cultural sites are addressed in Section 4.15.
- For purposes of this analysis, potential effects or impacts are considered either construction-related or operation and maintenance-related. Construction-related impacts are assumed to be short-term and visible during construction activities of 1 year; operation and maintenance-related impacts are assumed to be long-term and visible for the duration of the operation/maintenance phase of the project.
- The evaluation takes into account the SCPs, EPMs, and the special design features included in Chapter 2.0, Section 2.5.
- There is a wide and diverse range of opinions on the visual significance of transmission projects. A goal of the USFS SMS is to objectively quantify the changes introduced by a project compared to existing conditions and management objectives, with the commonly held perception that natural-appearing landscapes are more attractive to viewers.

4.12.2 Significance Criteria

A significant impact on visual resources would result if any of the following were to occur from constructing or operating the proposed project:

- Unresolved conflicts with the visual resource goals and policies of Larimer County or Town of Estes Park on County-owned or private land, or state policies for state stewardship trust lands.
- Substantial dominant visual changes in the landscape that are seen from highly sensitive viewer locations (e.g., community gateways, roadside parks, viewpoints, and historic markers) or locations with special scenic, historic, recreational, cultural, archaeological, or natural qualities that have been recognized in adopted plans or some other official declaration.

4.12.3 Impacts Common to All Alternatives

As large-scale forms and lines, transmission lines create long-term changes to the visual setting and can be visible from many locations. Adverse or beneficial visual changes would occur from the following short- and long-term activities consistent with Chapter 2.0 and implementation of Western's SCPs and special design criteria. Short-term effects consider ROW construction activities, clearing, grading, and vehicular traffic; new and/or improved temporary and permanent access roads; and construction staging areas. Long-term effects consider new and/or expanded ROWs; and operations and maintenance activities. All short-term and long-term effects for visual resources are direct effects. Therefore, discussion of indirect effects is not carried forward through each of the impact sections that follow.

Right-of-Way Construction Activities, Clearing, Grading, and Vehicular Traffic

Clearing and grading to remove trees and shrubs from structure locations and along access roads would occur. Viewers would see structure excavation, assembly, placement, cuts and fill from structure sites, and conductor installation with heavy equipment at the structure sites and staging areas. Boom trucks and cranes would be seen raising structures. Conductor pulling, sagging, and clipping by ground vehicle or helicopter would be visible. Nearly all these activities would occur on existing ROWs. Construction activities, as well as the associated work force and dust would be most visible in the Estes Valley and Flatiron Reservoir areas. Direct short-term adverse visual impacts would occur in these locations.

At the conclusion of construction, site cleanup and restoration activities would remove debris, recontour, reseed, and mulch disturbed areas to re-establish vegetative cover. The reclaimed areas would have a noticeably smoother and more uniform texture, color, and form than adjacent undisturbed areas. When the construction is complete, there would be no more movement of equipment, therefore the level of impact would decrease.

New and/or Improved Temporary and Permanent Access Roads

Where existing roads are unsuitable or not available and overland access is not feasible, access roads would be improved or created to structures sites within the ROW. Western would make the decision whether to modify access roads or set structure sections by helicopter. New or improved access roads would create a strong line and color contrast on the landscape. In steep terrain, roads may need to switchback to maintain an acceptable grade, increasing their length. Cuts and side-casted fill from improved roads in steep terrain would increase contrasts. Because of cost, environmental impact, and long-term maintenance considerations, such roads would be avoided to the extent possible through siting and design of the new line.

Construction Staging Areas

Two temporary staging areas of approximately 1.5 acres each would be required for temporary equipment staging, material laydown, and storage facilities. Locations have not been established and could potentially be visible from sensitive viewing areas; however, Western has committed to place staging areas on existing disturbance where practicable, and not on USFS land. Direct, adverse impacts would occur during the construction period from the presence of equipment, materials, and associated dust, as well as a work force. Short-term soil disturbance in the ROW would be visible until the areas have been successfully revegetated.

<u>New and/or Expanded Rights-of-Way and Vegetation Management</u>

All alternatives and the variants use an existing ROW for the majority of their route, expanded as needed primarily for alternatives that would utilize the North Line. In general, utilizing the existing ROW would have lower effects on visual resources than siting a line on new ROW for several reasons: access roads exist, vegetation has been cleared and continually maintained for decades, and viewers are accustomed to seeing the existing transmission line. However, in some cases – namely where crossing major roads and residential areas – the existing ROW would have greater impacts than a new ROW that avoided sensitive viewing areas. The maintained ROWs of all alternatives, including the No Action Alternative, would be visible from eastern portions of Rocky Mountain National Park near Estes Park, where urban development and various human activities are very apparent. While comprising part of background views from the Park, the maintained ROW would be somewhat visible from higher viewpoints on trails and roads. However, these higher viewpoints are further away from the transmission lines.

In visually sensitive areas, incorporating the design criteria of, leaving some low-growing trees within the ROW and/or implementing a less-aggressive treatment of the ROW would lessen the visual contrast.

<u>Operations and Maintenance Activities</u>

Long-term routine activities include aerial inspections, ground inspections, maintenance and repair of project components, and vegetation management. Maintenance operations would include aerial and ground patrols for monitoring, vegetation management, and equipment repair. Viewers in the vicinity of the route would be able to see ground inspections. These annual maintenance activities would result in a negligible change to the visual environment.

4.12.4 No Action Alternative

The No Action Alternative keeps the two existing transmission lines in service through continuing structure replacement and maintenance.

The height of the existing H-frame structures varies from 50 feet to 75 feet high, with an average of 40 feet shorter than the 105-foot standard steel monopole used in Alternatives A through C and 20 feet shorter than the 85-foot shortened steel monopole proposed as an option in special situations. The lower height and use of wood materials that blend with the colors and textures of the forest in the analysis area results in the H-frame structure having the least visual impact relative to the typical structures for Alternatives A through C described in Chapter 2.0. Further, since their construction 60 and 75 years ago, viewers have become accustomed to the presence of the existing transmission lines, lessening their visual impact compared to a single, taller steel transmission line.

Ponderosa pine, aspen, and mixed conifer stands, which are adjacent to approximately 70 percent of the existing ROWs and sensitive viewing locations, are highly effective at screening and/or providing a backdrop for the No Action Alternative (see KOPs 1, 2, 11, 12, and Section 3.7). The existing tree canopy is estimated at an average height of 45 feet and generally screens the (Collaborative Forest Landscape Restoration Program 2010) lower two-thirds of the H-frame structures when seen from ground level. The effectiveness of tree screening is directly proportional to tree species and stand density. Conifers provide year-round screening, while aspens provide seasonal screening. Where they cross open mountain shrub and upland meadows, the existing lines attract attention in the foreground. The visual impact of individual wood H-frames decreases substantially with distance as the lower profile structures blend with the background.

Short-term impacts associated with maintenance operations to incrementally repair and replace deteriorating structures would occur sporadically and with increasing frequency over several years across the extent of the project, compared to a defined timeframe of 8 to 12 months for the action alternatives. The new structures would locally increase the lines' visibility and attract viewer attention, thus increasing adverse effects. New temporary and permanent access roads to structure sites would be required in some areas, creating linear contrasts.

Because vegetation management has been occurring continually on the existing lines – as recently as 2016 – the long-term appearance of the maintained ROW would be similar to existing conditions. Selective trees would be removed for safety during construction or long-term operations if they are capable of growing within 22 feet of the transmission line conductors.

The two existing transmission lines are frequently within the same viewshed for the majority of their length, which increases the level of impact at these locations. The two transmission lines can be seen the entire extent along Pole Hill Road, except for within the Meadowdale Hills subdivision and north of Pinewood Reservoir. The dual transmission lines decrease the area’s scenic attractiveness and fragment its scenic integrity. That being said, the two lines have been present for so long they have become part of the landscape and typically do not draw attention.

Tables 4-12-1a-e and **Figure 4.12-1** describe the impacts by KOP and indicate the KOP locations for the No Action Alternative and others. Visual contrasts occur and would continue to occur most prominently from the existing transmission lines in the following conditions:

- Where immediately adjacent to viewers (see KOPs 3, 5, 8, 13, and 14);
- Where skylined, which increases the intensity and distance of contrasts (see KOPs 2, 10, 12, and 13);
- Where maintained ROWs through forest stands result in a “corridor effect” with cross-beamed structures in the center, especially when the ROW is parallel to the line of sight (see KOPs 1, 2, 3, 6, 7, and 12); and
- Where both ROWs are seen in the same view (see KOPs 1, 2, 3, 8, 9, 10, 12, and 13).

Views immediately adjacent to the existing transmission lines would continue to be affected in a manner similar to current project conditions. These include 1 mile along U.S. Highway 36, 0.5 mile along Mall Road, and along much of Pole Hill Road.

Visual impacts to private residences would be highly variable and localized due to building and window orientation, tree screening, and the large number of existing built structures and overhead electric distribution lines within these subdivisions. Residences immediately adjacent to the ROW in the Park Hill, Meadowdale Hills, Vogel, and Ravencrest subdivisions would continue to be affected in a manner similar to current project conditions. Beneficial effects would occur in the central and southwestern portion of the Newel Lake View subdivision where the existing transmission line would be removed; conversely residents at the southern perimeter of Newell Lake View subdivision along Pole Hill Road would be adversely affected by the relocated alignment (see KOP 8).

Over the long term, annual operations and maintenance activities would be similar to those that have occurred for decades, though with increased frequency, until all incremental replacements have been accomplished. Maintenance operations would include aerial and ground patrols for monitoring, vegetation management, structure replacement and repair, and general structure inspection and maintenance activities. Residents and visitors in the vicinity of the routes would be able to see ground and helicopter inspections, which would be very short term and any given location. Western’s vegetation maintenance regime would maintain and expand the existing width (along the North Line) of the cleared ROW through densely timbered areas. Therefore, existing visual conditions would continue from the presence of two H-frame transmission lines, maintained ROWs, and permanent access roads, especially as seen from residential, recreation, and highway areas.

Effects on Forest Service Scenic Integrity Objectives

The existing transmission lines cross National Forest System lands with an SIO of Moderate. The No Action Alternative complies with the USFS planning SIO of Moderate, with the line being subordinate to the overall landscape character and long-distance views of the Front Range.

National Forest System lands in Sections 26, 34, and 35, T5N, R72W are crossed by the North Line and South Line and are visible in the immediate foreground from (west to east) KOPs 14, 6, and 7. The existing scenic integrity at KOP 14 is Low; at KOPs 6 and 7, the existing scenic integrity is Moderate or higher (**Table 4.12-1**). These sections comprise a major ridgeline between the Estes Valley and private portion of Pole Hill Road along the North Fork starting at Sections 25 and 26, T5N, R72W. National Forest System lands are used for seasonal motorized recreation, hiking, cross country skiing, and dispersed hunting and camping on a network of USFS roads, including USFS Roads 122 and 247, which are open between June and November. This is the highest elevation crossed by the transmission lines. The landscape character is heavily forested with foreground and middleground views representative of southern Rocky Mountain scenery, which is strongly influenced by views of the snow-capped mountains of Rocky Mountain National Park in the background.

Although within 0.5 mile of each other, the lines are typically not seen together due to the steep terrain and dense forest stands that screen long-distance views from roads. Views of the line are typically limited to the immediate foreground (one to two structures), which are often located at high points in the mountainous terrain. The valued landscape character appears intact, with the separated lines screened and repeating the color and form of forest stands. The lower profile scales of the existing structures do not attract attention above the tree canopy. The Adopted SIO of Moderate is achieved with the line subordinate to the overall landscape character and long-distance views of the Front Range.

National Forest System lands in Section 27, T5N, R71W also are crossed by the North Line and South Line. The existing North Line can be seen from KOP 7 and is visible east-west along Pole Hill Road. This section of Pole Hill Road is used by property owners and the adjacent National Forest System lands are used for dispersed recreation, including hunting and camping. The North Line ascends a steep section of National Forest System land below The Notch and the structures are heavily screened by tree stands, rock outcrops, and terrain bordered by residential and forestry uses. Where not partially screened, North Line structures can be seen along Pole Hill Road at three crossings. The majority of the South Line is not visible from public roads across National Forest System lands, except for structures crossing Pole Hill Road. In the immediate foreground of the existing lines and BOR facilities, views appear moderately altered. Views oriented away from or more than 300 feet from these facilities appear intact and predominantly natural. Overall, the valued landscape character appears intact across the majority of this section, with the separated lines partially screened and repeating the color and form of forest stands and at a lower profile scale that does not attract attention above the tree canopy. Where the two lines converge, the character appears moderately altered because each line straddles Pole Hill Road to the north and south within 0.25 mile of each other. Deviations attract the most attention when views of the ROW are oriented parallel to the line of sight and where typical screening is absent. The Adopted SIO of Moderate is met as the lines remain subordinate to the overall landscape character and long-distance views of the Front Range.

4.12.5 Impacts Unique to Specific Action Alternatives

4.12.5.1 Alternative A

Short- and long-term direct effects within the analysis area from Alternative A would be very similar to the effects described under Impacts Common to All Alternatives. **Tables 4.12-1a-e** and **Figure 4.12-2** describe the impacts by KOP and viewshed analysis of Alternative A. In particular, narratives presented in **Tables 4.12-1a-e** describe potential impacts at KOP locations for the corresponding Alternative A alignment depicted in **Figure 4.12-2**. Simulations of Alternative A can be found in **Appendix C**.

Table 4.12-1a Impacts by Key Observation Points (KOPs 1–2)

	KOP 1	KOP 2
Location & View Direction	**Stanley Hotel: View looking southeast from the Stanley Hotel, 1.7 miles from the project end point.** The Stanley Hotel is on the NRHP and a historic and scenic resource in Estes Park. Also representative of tourism and residential views from Estes Park. Landscape visibility is High, due to the high volume of use and high scenic concern levels associated with visitors. Scenic attractiveness includes Class B Estes Park and Rocky Mountains. Existing scenic integrity ranges from Moderate to Low.	**U.S. Highway 34: View looking southeast from U.S. Highway 34 at Lone Tree Drive, 0.6 mile from the project end point.** Representative of tourism and views from Estes Park. The southeast view looks toward Mount Olympus, Mount Pisgah and mixed commercial and hotel land uses along the highway Scenic attractiveness is Class B, with views of the mountains being typical of the Southern Rocky Mountains Steppe ecoregion. Landscape visibility and sensitivity is High, due to the high volume of traffic, and high viewer interests in scenery. The existing scenic integrity ranges from Moderate to Low.
Visualization of Alternative	A, A1, B, C	A, A1, A2, B, C, C1
No Action Alternative	While most of the mountains appear natural and unaltered, existing roads, community developments in Estes Park, and the two existing transmission ROWs on the mountain slopes to the north and south of U.S. Highway 36 have noticeably altered the natural landscape character to the east. The project's transmission structures, conductors, and ROW vegetation management practices have created moderately contrasting form and line on elevated west-facing, forested slopes.	While most of the mountains appear natural and unaltered, existing roads, community development in Estes Park, and the two existing transmission ROWs on the mountain slopes to the north and south of U.S. Highway 36 have noticeably altered the natural landscape character in views to the east. The South Line is more visible than the North Line, which is screened by Mount Olympus. The South Line is parallel with side slope contours, reducing contrasts from ROW maintenance, until above the U.S. Highway 36 overlook where the ROW's steep slope attracts attention. Existing transmission structures are not evident in forested areas, but would be where located above the U.S. Highway 36 overlook and approaching the Lake Estes Causeway (outside of the photograph frame).
Alternative A	The existing moderately contrasting ROW to the north would appear similar to existing conditions, though with stronger vertical structure contrasts from taller and wider monopoles. Structures would be skylined at The Notch and extend 50 percent above the tree canopy. Low contrast in non-forested areas. The abandoned ROW south of U.S. Highway 36 would revegetate in 20 years.	ROW maintenance is screened by Mount Pisgah; three structures would be visible in the meadow above the Big Thompson River. Additional structures would be visible south of Lake Estes dam when not screened by highway commercial uses (outside of the photograph frame). The abandoned ROW south of U.S. Highway 36 would revegetate in 20 years.
Variant A1	At The Notch and in open non-forested areas, contrasts would be the same as Alternative A. On lower slopes, Alternative A creates a new southwest ROW towards U.S. Highway 36, which would be screened by trees when parallel to contours. Residual contrasts in abandoned ROWs to the north and south of U.S. Highway 36 would revegetate in 20 years.	On lower slopes, Alternative A creates a new southwest ROW towards U.S. Highway 36, which would be screened by trees when parallel to contours. New monopoles would extend 50 percent above the existing canopy. Residual contrasts in abandoned ROWs to the north and south of U.S. Highway 36 would revegetate in 20 years.
Variant A2	The upper alignment would be similar to Variant A1, though no transmission structures would be installed and the ROW would appear slightly narrower and devoid of small trees and shrubs. Below the Estes Park overlook, the underground ROW would turn northwest. The ROW would be screened by trees when parallel to contours. At this distance, no ROW would be evident when crossing meadows once reclamation is complete. A pair of transition structures would be visible connecting to the existing lattice structures at Lake Estes. No other segments of Variant A2 would be visible. Residual contrasts in abandoned ROWs to the north and south of U.S. Highway 36 would revegetate in 20 years.	The upper alignment would be similar to Variant A1, though no transmission structures would be installed and the ROW would appear slightly narrower and devoid of small trees and shrubs. Below the Estes Park overlook, the underground ROW would turn northwest. The ROW would be screened by trees when parallel to contours. At this distance, no ROW would be evident when crossing meadows once reclamation is complete. Residual contrasts in abandoned ROWs to the north and south of U.S. Highway 36 would revegetate in 20 years.
Alternative B	The existing moderately contrasting ROW south of and along U.S. Highway 36 would appear similar to existing conditions, though with stronger vertical structure contrasts from taller and wider monopoles, especially above the U.S. Highway 36 overlook. Where parallel to U.S. Highway 36, adverse impacts from the new structures would be less than a new ROW because it would follow the existing highway corridor as seen from KOP 1. The abandoned ROW north of U.S. Highway 36 would revegetate in 20 years.	On the southern ROW, three structures would be skylined. ROW maintenance would create more contrast than the No Action Alternative. Contrasts would increase above the U.S. Highway 36 overlook. Where parallel to U.S. Highway 36, adverse impacts from the new structures would be less than a new ROW because it would follow the existing highway corridor as seen from KOP 2. The abandoned ROW north of U.S. Highway 36 would revegetate in 20 years.
Alternative C	A new ROW would follow a drainage north of and below U.S. Highway 34, widening the natural clearings and creating moderate contrasts in form, color, texture, and structures. Residual contrasts in abandoned ROWs to the north and south of U.S. Highway 36 would revegetate in 20 years.	East of Mount Pisgah two structures would be skylined. A new ROW would follow a drainage north of and below U.S. Highway 34, widening the natural clearings and creating highly visible contrasts in form, color, texture, and structures. Residual contrasts in abandoned ROWs to the north and south of U.S. Highway 36 would revegetate in 20 years.
Variant C1	The upper alignment would be similar to Alternative C, and would attract less attention at this distance as no transmission structures would be installed and the ROW would appear slightly narrower and devoid of small trees and shrubs. The ROW would be screened by trees when parallel to contours. No ROW would be evident when crossing meadows once reclamation is complete. Residual contrasts in abandoned ROWs to the north and south of U.S. Highway 36 would revegetate in 20 years.	The upper alignment would be similar to Alternative C, and would attract less attention as no transmission structures would be installed and the ROW would appear slightly narrower and devoid of small trees and shrubs. The ROW would be screened by trees when parallel to contours. No ROW would be evident when crossing meadows once reclamation is complete. Residual contrasts in abandoned ROWs to the north and south of U.S. Highway 36 would revegetate in 20 years.
Alternative D	Similar to the No Action Alternative. Stronger contrasts from ROW clearing, though ROW width would be similar to existing conditions.	Similar to the No Action Alternative. Stronger contrasts from ROW clearing, though ROW width would be similar to existing conditions.

[1] See **Appendix C** for visualizations of the noted alternatives.

Table 4.12-1b Impacts by Key Observation Points (KOPs 3–5)

	KOP 3	KOP 4	KOP 5
Location & View Direction	**U.S. Highway 36: View Looking Northwest towards South Line.** Westerly views entering Estes Park and of adjacent mountains. Scenic attractiveness is Class B, with spectacular and unique views of the Rocky Mountains dominating the viewer's attention above Estes Park. Landscape visibility and sensitivity is High, due to the high volume of traffic, and high viewer interests in scenery.	**U.S. Highway 36, Estes Park Overlook / Entrance Sign: View looking west towards Estes Park.** Representative of tourism, views entering Estes Park on U.S. Highway 36. This popular tourist overlook allows for pedestrian views and photography. Views are directed toward rock outcroppings, Mount Olympus and Rocky Mountain National Park above the 'Estes Park' sign. Background views to Rocky Mountain National Park are Class A, and foreground and middleground views are Class B. Landscape visibility and sensitivity is High.	**Meadowdale Hills Subdivision: View Looking Northeast Towards South Line.** Residential views. Scenic attractiveness is Class B. Scenery is typical of rural residential subdivisions, located near Estes Park in the Southern Rocky Mountains. Landscape visibility and sensitivity is High for northwestern Meadowdale Hills and Ravencrest residents, with partial visibility from U.S. Highway 36.
Visualization of Alternative	A1, B, C	A1, C	B, C
No Action Alternative	The existing scenic integrity of the view is Low. While the mountains beyond Lake Estes appear predominantly natural and unaltered, the existing South Line structures and conductors are clearly visible and have noticeably altered the natural landscape character for 0.75 mile adjacent to the highway.	The existing scenic integrity of the view is Moderate and is negligibly impacted by the existing lines. The view appears predominantly natural and unaltered, except for the existing roadway and distant developments in Estes Valley. The primary view towards the sign appears predominantly natural and unaltered. Secondary views upslope towards the South Line are screened. Downslope from the pedestrian overlook, the North Line lies in a drainage and is partially screened 0.5 mile below the viewer by terrain and trees surrounding the overlook. No vegetation management can be seen.	The existing scenic integrity of the view is Low. The natural vegetation, landforms and rock forms are dominant aspects of the seen environment, although these co-exist with the existing South Line, residential homes, distribution lines, and roads, which have noticeably altered the landscape setting. Immediately south, traffic along U.S. Highway 36 is ever present. Existing moderate to strong contrasts line and form are attributable to the existing transmission facility.
Alternative A	The South Line adjacent to U.S. Highway 36 would be removed, beneficially improving the scenic integrity. Alternative A would not be noticeably visible to the north through conifer stands.	The North Line would be rebuilt and not visible when looking towards the sign. From the pedestrian overlook, the top of the taller structures would be partially visible, with ground disturbance at the base of Mount Pisgah not visible.	Alternative A would not be visible from Meadowdale Hills subdivision, as it is screened to the north by Mount Pisgah. The South Line would be removed; that would create moderate to significant beneficial effects as that existing ROW returns to natural conditions.
Variant A1	Both the North Line and South Line adjacent to U.S. Highway 36 would be removed, beneficially improving the scenic integrity. Alternative A1 would be visible approaching and then running parallel to the highway, 0.05 mile downhill from KOP 3. Two angle structures would be adjacent to the roadside resulting in a minor adverse impact to scenic integrity and viewer sensitivity.	From the base of Mount Pisgah, the North Line would turn southwest and approach the overlook until 0.1 mile downslope, then turn northwest towards Estes Park. Structure bases would be located on elevations between 7,580 and 7,600 feet. The elevation of the overlook is 7,725 feet, a difference of 125 to 145 feet. Neither the 85 nor the 105-foot-tall structure would extend above the overlook. The tops of the structures would be partially visible (screened by trees and the highway embankment) when looking downward from the highway, near the Estes Park sign, and pedestrian overlook.	Same as Alternative A.
Variant A2	A pair of transition structures would be visible connecting to the existing lattice structures at Lake Estes. Their height would be similar to structures in Alternative A through C, though the unique configuration would attract attention. No other segments of Variant A2 would be visible.	The upper alignment would be similar to Variant A1, and would be partially visible. The ROW would attract less attention as no transmission structures would be installed and the ROW would appear slightly narrower. In the foreground, greater contrast would result from the ROW devoid of small trees and shrubs compared to overhead alternatives where small trees and shrubs would be present. Residual contrasts in abandoned ROWs to the north and south of U.S. Highway 36 would revegetate in 20 years.	Same as Alternative A.
Alternative B	The North Line, which is screened by trees, would be removed. Alternative B would replace the South Line along U.S. Highway 36 for 0.75 mile. The scale of the taller structures and immediate proximity to vehicles would have a significant adverse impact across this segment to scenic integrity and viewer sensitivity. However, the scenic integrity is Low in the existing condition, as described above for the No Action Alternative,	The North Line would be removed, and Alternative B would be partially visible to the south above the forest canopy. Alternative B is not aligned in the direction of highway or overlook views and would be a minor beneficial effect.	The rebuilt South Line would attract the attention of residents and be a moderate to significant adverse impact to the visual setting for travelers and homes along Pole Hill Road. However, the existing scenic integrity is Low, as described above for the No Action Alternative. The intensity of the potential rebuild impacts would depend on viewer orientation and proximity. The effects of vegetation management would be similar to existing conditions on south slopes.
Alternative C	Same as Alternative A1.	The North and South lines would be removed. Alternative C generally parallels U.S. Highway 36 in a drainage 0.1 mile downslope of the highway and overlook. At the overlook, pedestrians would see only the structures immediately below, as east-west views are screened by trees. Structure bases would be located at elevations between 7,580 and 7,600 feet. The elevation of overlook is 7,725 feet, a difference of 125 to 145 feet. Neither the 85 nor the 105-foot-tall structure would extend above the overlook. The tops of the structures would be partially visible (screened by trees and the highway embankment) when looking downward from the highway, near the Estes Park sign, and pedestrian overlook.	Same as Alternative B.
Variant C1	Same as Variant A2.	The upper alignment would be similar to Alternative C, and would be partially visible. The ROW would attract less attention as no transmission structures would be installed and the ROW would appear slightly narrower. In forested areas in the foreground, greater contrast would result from the maintained ROW devoid of small trees and shrubs compared to overhead alternatives where small trees and shrubs would be present. Residual contrasts in abandoned ROWs to the north and south of U.S. Highway 36 would revegetate in 20 years.	Underground construction of Variant C1 would attract less attention than Alternatives B or C. The disturbed ROW would create minor to moderate adverse impact to views from residences and travelers along U.S. Highway 36 and Pole Hill Road. Upon completion of reclamation, greater contrast would result over the life of the project from the maintained ROW devoid of small trees and shrubs compared to overhead alternatives where small trees and shrubs would be present.
Alternative D	Similar to the No Action Alternative. Stronger contrasts from ROW clearing, though ROW width would be similar to existing conditions.	Same as the No Action Alternative.	Same as the No Action Alternative.

Table 4.12-1c Impacts by Key Observation Points (KOPs 6–8)

	KOP 6	KOP 7	KOP 8
Location & View Direction	Pole Hill Road: View from USFS Lands near Pole Hill Road and Microwave Station, Looking Southwest Towards South Transmission Line. National Forest System lands, residential, dispersed recreation. Views are of the Southern Rocky Mountains oriented towards the snow-capped Rocky Mountain National Park mountains. Scenic attractiveness is Class A in the background and Class B in the foreground. Adjacent scenery strongly influences the overall scenic attractiveness. Landscape visibility is Moderate, viewer volume is Low, and viewer interest in scenery is considered Moderate based on scoping comments.	Pole Hill Road: View from Quillan Gulch Road, Looking West Towards the North Line and National Forest System lands. National Forest System lands, residential. Pole Hill Road is used for access to National Forest System lands and private residences. Foreground views are typical of the scenery in the southern Rocky Mountains. Scenic attractiveness is Class B. Landscape visibility is Moderate, as viewer volume is Low, and viewer interests in scenery are considered Moderate.	Pinewood Reservoir: Day Use Area View looking South/Southwest. Wide panoramic views across Pinewood Reservoir and conserved lands. Views are directed towards the water and shoreline to the south and southwest. Scenic attractiveness is Class B. Landscape visibility and sensitivity is High towards the reservoir, due to the open water and grassland/shrub vegetation, residential, recreation, and protected area concerns for Larimer County Open Space (Pinewood Reservoir, Ramsay Shockey, Blue Mountain Bison Ranch), and State Stewardship Trust. Landscape visibility is Moderate east of Pinewood Reservoir due to ponderosa pines and residential uses.
Visualization of Alternative	B, C	A, B, C	A, B, C
No Action Alternative	The existing scenic integrity of the view is Moderate. The view appears predominantly natural and unaltered, except for a segment of the existing southern transmission line and ROW, which is visible in the foreground. Danger trees were removed between 2009 and 2011. When views are oriented down the ROW, moderate contrasts result from the texture, color, and lines of ROW maintenance and H-frame structures. Corridor impacts decrease substantially when views do not align parallel with the ROW.	The view appears predominantly natural and unaltered, except for a segment of the existing southern transmission line and ROW, which is visible in the foreground. Danger trees were removed between 2009 and 2011. When views are oriented down the ROW, moderate contrasts result from the texture, color, and lines of ROW maintenance and H-frame structures. Corridor impacts decrease substantially when views do not align parallel with the ROW.	The existing scenic integrity across the lake is Moderate. The view appears predominantly natural, except for Newell Lake View subdivision to the east, scattered residential uses to the south, distribution lines, and the two existing transmission lines. The South Line is a focus of viewer attention and is visible in views to the south and west of the reservoir and from the Newell Lake View subdivision. One existing structure is skylined on a knoll. Further west, the South Line becomes backdropped then screened by the natural terrain and conifers. The North Line that currently crosses through the Newell Lake View subdivision would be re-routed along Pole Hill Road. Effects from the re-routed line would appear similar to existing conditions from the day use area, as recreational views are oriented towards the lake (opposite the re-routed line). The majority of Newell Lake View subdivision residents would then look over the top of the re-routed line, except for those residences adjacent to Pole Hill Road.
Alternative A	Alternative A would be partially visible to the north, through and above the forest canopy. The South Line would be removed and be a moderate beneficial effect.	Vegetation maintenance would create more contrast than the existing conditions. Taller, heavier-appearing structures that would be visible above the tree canopy would result in moderate adverse impacts to scenic integrity.	The North and South lines would be removed, with significant beneficial effects. Alternative A would not be visible north of Pinewood Dam.
Variant A1	Same as Alternative A.	Same as Alternative A.	Same as Alternative A.
Variant A2	Same as Alternative A.	Same as Alternative A.	Same as Alternative A.
Alternative B	Vegetation maintenance contrasts would be stronger than existing conditions. Taller, heavier-appearing structures would result in moderate adverse impacts to scenic integrity that would be visible above the tree canopy.	Same as Alternative A.	The North Line through Newell Lake View subdivision and along Pole Hill Road would be moved with moderate beneficial effects. New structures on South Line would dominate attention, with two skylined structures seen from the day use area. This would result in significant adverse effects along part of the South Line. Note that for existing conditions (described above for the No Action Alternative), the South Line there is already a focus of viewer attention, with one existing structure skylined on a knoll. The overall incremental impacts along the South Line would be moderate.
Alternative C	Same as Alternative B.	Same as Alternative A.	The South Line near the reservoir and the North Line through Newell Lake View subdivision would be removed, with significant beneficial effects. Alternative C would follow Pole Hill Road around Newell Lake View subdivision east of Pinewood Reservoir. Negligible effects would occur to day use area users, as recreational views are oriented towards the lake. From the lake looking east, Alternative C would be backdropped by a mountain and residential area with Low scenic integrity. The majority of Newell Lake View subdivision residents would look over the top of Alternative C, except for those at the base of the mountain adjacent to Pole Hill Road.
Variant C1	Same as Alternative B.	Same as Alternative A.	Same as Alternative C.
Alternative D	Similar to the No Action Alternative. Stronger contrasts from ROW clearing, though ROW width would be similar to existing conditions.	Similar to the No Action Alternative. Stronger contrasts from ROW clearing, though ROW width would be similar to existing conditions.	Same as the No Action Alternative.

Table 4.12-1d Impacts by Key Observation Points (KOPs 9–11)

	KOP 9	KOP 10	KOP 11
Location & View Direction	West County Road 18E: View Looking Southeast Towards both Transmission Lines. West County Road 18 W provides residential access to the area and to Pinewood Reservoir, and is used extensively for biking. Views of the Great Plains are in the background; foreground views are to Bald Mountain with Chimney Hollow and Flatiron in the middleground. Scenic attractiveness is Class B. Landscape visibility is Moderate, high visual absorption capability and moderate volume of use.	Pole Hill Road / County Road 18E at Flatiron Picnic and Day Use Area: View Looking at North and South lines. Residential, recreation, and Larimer County Open Space (Chimney Hollow, Flatiron Reservoir) uses. Flatiron Reservoir is a 47-acre reservoir, which is part of the CBT project, and provides fishing, picnicking and camping opportunities. Scenic attractiveness to the west is Class B. Landscape visibility is Moderate, due to the viewing distance, moderate volume of use, and high viewer interests in scenery.	Hermit Park: Looking towards South Line through Meadowdale Hills. Larimer County Open Space (Hermit Park), U.S. Highway 36 and residential uses. This KOP is taken at the entrance station of Hermit Park, a popular County open space providing camping, hiking, and wildlife viewing opportunities. Scenic attractiveness to the south across U.S. Highway 36 to the Meadowdale Hills/Ravencrest subdivision is Class B. Landscape visibility is High, due to the viewing distance, high volume of use, and high viewer interests in scenery.
Visualization of Alternative	B, C	A, B, C	None
No Action Alternative	Bald Mountain is characterized by a mosaic of low-profile grey/green shrub and grassland vegetation colors and textures, which contrast with the steeper slopes and reddish soils and rocks of Flatiron. The existing scenic integrity of the view is Low. The natural scenery has previously been altered by the presence of crisscrossing roads and transmission lines, residential uses, Flatiron substation, aboveground pipelines from the CBT project, as well as a radio tower stations. The two transmission lines cross Pole Hill Road six times. Radio towers are visible on Bald Mountain to the south and on a mountain to the north.	Views are directed east towards Flatiron Reservoir and secondly to steep slopes and ridgelines in every direction. East-facing slopes are covered with grasses and sagebrush at lower elevations, with dark evergreens predominating on higher mountain slopes. The existing scenic integrity looking west is Low. The natural scenery has previously been altered by the predominance of roads and three transmission lines heading to the Flatiron substation, residential uses, aboveground pipelines from the CBT project, as well as a radio tower stations. Radio towers are visible on Bald Mountain to the south and on a mountain to the north.	The existing scenic integrity of the view is Low. The rocky mountainside and ponderosa trees are dominant aspects of the seen environment, although these co-exist with traffic, U.S. Highway 36, the existing South Line, residential homes, distribution lines, and roads which have moderately altered the landscape setting. The South Line descends along a major ridgeline crossing U.S. Highway 36. Here the highway crests a pass near Mount Pisgah, unveiling the first westbound view of the Estes Valley. Scenic integrity improves looking west towards Mount Pisgah and background views of Rocky Mountain National Park due to the absence of residential development and the highway. Strong-contrast line and form are due to the existing transmission facility, which has three skylined structures.
Alternative A	The North Line would be rebuilt and visible to the northeast, as it ascends north of the Newell Lake View subdivision. The taller structures would cross West County Road 18E four times attracting more attention than the existing line, resulting in moderate adverse effects. The South Line would be removed, resulting in moderate beneficial effects.	The North Line would be rebuilt and visible to the northwest. From an inferior position (compared to KOP 9), the taller structures would be sited on minor ridgelines and cross West County Road 18E four times attracting more attention than the existing line, resulting in moderate adverse effects. The South Line would be removed, resulting in moderate beneficial effects.	Alternative A would not be visible from Meadowdale Hills subdivision, as it is screened to the north by Mount Pisgah. The South Line would be removed and be a moderate to significant beneficial effect.
Variant A1	Same as Alternative A.	Same as Alternative A.	Same as Alternative A.
Variant A2	Same as Alternative A.	Same as Alternative A.	Same as Alternative A.
Alternative B	The South Line would be rebuilt and visible to the east. The taller structures would cross West County Road 18E two times attracting more attention than the existing line, resulting in moderate adverse effects. The North Line would be removed, resulting in moderate beneficial effect.	The South Line would be rebuilt and visible to the west. The taller structures would attract more attention than the existing line, resulting in moderate adverse effects. Alternative B lies lower than Alternative A in a drainage and is removed from residential uses along Pole Hill Road, resulting in less contrast than Alternative A. The North Line would be removed, resulting in moderate beneficial effects.	Alternative B would attract the attention and be a significant adverse impact to the visual experience of tourists, recreationists, and travelers as the six conductors cross U.S. Highway 36. Three taller structures would be skylined from this view. However, the existing scenic integrity is Low, as described above for The No Action Alternative. Vegetation management and roads would be similar to existing conditions. Rebuilding through this altered rural residential area with mountainside roads and distribution lines lessens impacts to tourists and recreationists at Hermit Park and U.S. Highway 36 than if the line crossed through a natural-appearing scene.
Alternative C	Same as Alternative B.	Same as Alternative B.	Same as Alternative B.
Variant C1	Same as Alternative B.	Same as Alternative B.	Underground construction of Variant C1 would attract less attention than Alternatives B or C. The disturbed ROW would create minor to moderate adverse impact to views from residences and travelers along U.S. Highway 36 and Pole Hill Road. Upon completion of reclamation, greater contrast would result over the life of the project from the maintained ROW devoid of small trees and shrubs compared to overhead alternatives where small trees and shrubs would be present.
Alternative D	Same as the No Action Alternative.	Same as the No Action Alternative.	Same as the No Action Alternative.

Table 4.12-1e Impacts by Key Observation Points (KOPs 12–14)

	KOP 12	KOP 13	KOP 14
Location & View Direction	Lake Estes Causeway / U.S. Highway 36: View looking east towards project end point. Residential, tourism, Lake Estes, and U.S. Highway 36 uses. The eastward view is dominated by Lake Estes in the foreground and the forested and rocky backdrop of Mount Olympus and Mount Pisgah. Scenic attractiveness is Class B. Landscape visibility and sensitivity is High, due to the high volume of traffic, and high viewer interests in scenery.	Newell Lake View Subdivision: View looking east. Residential uses in the Newell Lake View subdivision have encroached on the existing North Line ROW, creating hazardous conditions. Scenery is typical of rural residential subdivisions in the foothills transition zone. Scenic attractiveness is Class B. Landscape visibility and sensitivity is High for southern residents along Pole Hill Road. Homes to the north are elevated, with views looking well above the North Line.	Pole Hill Road: View looking west from Pole Hill Road on National Forest System Lands towards Mount Pisgah, east of Meadowdale Hills Subdivision. The South Line crosses Pole Hill Road (USFS Road 122) seven times over two miles. Uses include National Forest System land activities, residential, and OHV. Views are of Mount Pisgah, Mount Olympus, and the southern Rocky Mountains oriented towards the snow-capped Rocky Mountain National Park mountains. Scenic attractiveness is Class A in the background and Class B in the foreground. Adjacent scenery strongly influences the overall scenic attractiveness. Landscape visibility is Moderate, viewer volume is Low, and viewer interest in scenery is considered Moderate based on scoping comments.
Visualization of Alternative	A2, C1	None	C
No Action Alternative	While the dominant mountains appear natural and unaltered, lattice transmission Structures along the Estes Lake Causeway have a major impact on the arrival/exit experience along U.S. Highway 36. The E-LS (North) and E-PH (South) lines terminate at the lattice transmission lines prior to crossing the causeway. On the North Line, one structure in the Park Hill subdivision and the ROW at the foot of Mount Olympus and The Notch beyond are visible. Three structures can be seen on the South Line, including one that is skylined. The contrast attributable to the No Action Alternative is minor in context with other transmission, highway, and residential facilities.	The existing scenic integrity of the view is Low. The natural vegetation and landforms are influential, but compromised by residential homes, distribution lines, roads, and radio towers which have noticeably altered the landscape setting. Under the No Action Alternative, the North Line would be relocated to skirt the southern boundary of Newell Lake View subdivision along Pole Hill Road, substantially benefitting residential views from this KOP. The number of residences with an immediate view of the relocated line would be approximately half that of the existing conditions. Views towards Pinewood Reservoir would look above the line rather than directly at it. The South Line near Pinewood Reservoir would appear the same as current conditions.	The existing scenic integrity of the view is Low. Human alterations are evident and somewhat dominate the natural landscape's character in the foreground. The existing South Line is visible in the foreground. Danger trees were removed between 2009 and 2011, and no discernable ROW is evident. When views are oriented down the ROW, moderate contrasts result from the texture, color, and lines of ROW maintenance and H-frame structures. ROW impacts decrease substantially when views do not align parallel with the ROW.
Alternative A	One structure would be visible in the Park Hill subdivision at a height 10 feet shorter than the 115-foot lattice structures. Structures could potentially be visible in the ROW at the foot of Mount Olympus and The Notch. The width of the ROW from vegetation maintenance would be similar to existing conditions, though few immature trees would remain the ROW. The South Line would be removed along U.S. Highway 36. Combined with the beneficial removal of the South Line, the adverse contrast attributable to Alternative A in context with other built features in this view would be minor.	The North and South lines would be removed, with major beneficial effects. Alternative A would not be visible from the Newell Lake View subdivision.	Alternative A would be partially visible to the north, through and above the forest canopy. The South Line would be removed and be a moderate beneficial effect.
Variant A1	Alternative A1 would be similar to Alternative A, except that the ROW at the foot of Mount Olympus would be revegetated over time. A ROW at The Notch and one structure in the Park Hill subdivision would be visible, resulting in minor adverse impacts.	Same as Alternative A.	Same as Alternative A.
Variant A2	A pair of transition structures would be visible connecting to the existing lattice structures at Lake Estes. Their height would be similar to structures in Alternatives A through C, though the unique configuration would attract attention. No other segments of Variant A2 would be visible.	Same as Alternative A.	Same as Alternative A.
Alternative B	The North Line would be removed and the ROW in the view would revegetate over time. The South Line ROW along U.S. Highway 36 would be screened similar to existing conditions, though up to two taller structures would be skylined above the U.S. Highway 36 overlook. Combined with the beneficial removal of the North Line, the adverse contrast attributable to Alternative B in context with other built features in this view would be moderate.	The North Line through Newell Lake View subdivision would be removed. Two taller structures on the South Line would be partially visible in the middleground and would not be skylined. Combined with the beneficial removal of the North Line, the adverse contrast attributable to Alternative B in context with other built features in this view would be negligible.	Vegetation maintenance contrasts would be stronger than existing conditions. Taller, heavier-appearing structures in the foreground generally paralleling Pole Hill Road would dominate the setting, adversely impact scenic integrity, and would be visible above the tree canopy.
Alternative C	Alternative C would be similar to Alternative B, except that only one structure would be visible in the Park Hill subdivision, with no structures skylined since the ROW would be screened in a low drainage. Alternative C would have the least adverse impact compared to all alternatives from this KOP.	Same as Alternative B within the frame of this KOP. Alternative C would follow Pole Hill Road. The majority of residential views would look above the new line. No transmission lines would be seen south of Pinewood Reservoir, a focal point that most homes are oriented towards.	Same as Alternative B.
Variant C1	Same as Variant A2.	Same as Alternative C.	Same as Alternative B.
Alternative D	Similar to the No Action Alternative. Stronger contrasts from ROW clearing, though ROW width would be similar to existing conditions.	Same as the No Action Alternative.	Similar to the No Action Alternative. Stronger contrasts from ROW clearing, though the ROW width and height of H-frame structures would be slightly higher.

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One 115-kV double-circuit transmission line would be constructed with single-column steel poles in the existing ROW. Structures would consist of steel monopoles and would average from 75 to 105 feet tall, constructed of dulled galvanized steel. The typical span between poles would be approximately 850 feet, with a maximum span of 1,300 feet. The solid surfaces of monopoles can be highly reflective if the surfaces are light in color and do not employ low-reflectivity coatings. The solid form, heavier width, strong vertical lines, and metallic colors, and smooth textures of these vertical structures would be discernible to the viewer, particularly within open landscapes in the foreground and middleground viewshed distances. Visual contrasts would be minimized with galvanized structures during periods of snow cover. Depending on viewer position, ROW maintenance would be visible up to 12 miles from the transmission line. Impacts at this distance would be negligible.

New, taller, less natural-looking (i.e., metal not wood poles) structures and associated disturbance would result in short- and long-term localized adverse effects ranging from minor to moderate. Adverse effects are increased where transmission lines are skylined or where the ROW is visible parallel to the line of sight. For example, two structures would occur on private land in Section 27, T5N, R72W where they would be seen skylined from the Estes Valley adjacent to a communication tower above a major ridgeline. Also in Sections 26 and 27, T5N, R72W, Alternative A descends a steep ravine and rocky outcrop below The Notch where access roads are limited to non-existent. Road construction would occur, and would include cut and fill grading along a series of switchbacks. In summary, the skylined structures, new permanent access roads, and the loss of tree screening from ROW maintenance, would increase the color and line contrasts of Alternative A seen from Estes Valley in the vicinity of The Notch.

Prior to and during the 8- to 12-month construction period, surveying, engineering, construction employees would be seen in the area at a rate similar to existing vehicular traffic. Construction activities would occur more or less continuously throughout the construction phase along the ROW for all action alternatives. Conductor pulling, sagging, and clipping by ground vehicle would be visible every 2 to 3 miles, or approximately at 5 locations along the alternative ROWs for Alternatives A through C and at approximately 10 locations for Alternatives D.

Although Alternative A was sited to avoid most residential homes whenever possible, the taller transmission line would create strong, indirect contrasts in the immediate foreground of residences in Crocker Ranch; recreational use areas, residences, and businesses along Mall Road; and along Pole Hill Road east of Pole Hill Substation. Within 150 feet, the visual dominance of the structures increases, and most residents would perceive the Project as degrading the scenic quality of the existing landscape over the long-term. In most residential areas, viewers would see Alternative A in context with smaller, existing electric distribution lines in the immediate foreground.

As noted in Section 2.2.2, Description of Transmission Facilities, structures with a shorter average height of 85 feet and shorter average span of 700 feet, would be considered where visibility from sensitive viewpoints is a major concern, including from Park Hill and Newell Lake View subdivisions and some segments of USFS lands. The shorter structures would be approximately 20 feet shorter on average than the taller 105-foot structures, with the trade-off that the use of shorter structures would result in roughly twice the number of structures in a given length of ROW due to the shorter span. Terrain also could dictate structure locations and shorter spans, and shorter structures would result from the design and engineering process.

Long-term, moderate beneficial effects would occur where the existing lines would be removed at Chimney Hollow Open Space, Pinewood Reservoir, along U.S. Highway 36, the Big Thompson River below Lake Estes, and the Newell Lake View, Meadowdale Hills, and Ravencrest subdivisions. West of The Notch along Pole Hill Road, Alternative A would have less visual impact than Alternative B because it is closer to Pole Hill Road, is backdropped at a lower elevation, and further from the majority of residences.

Vegetation management has been occurring continually on the existing lines to remove danger trees. In certain areas with inadequate ROW, Western has obtained landowner permission to remove danger trees beyond the ROW. Immature trees have been left in the ROW until they pose a threat to the transmission line. Under all action alternatives, Western proposes to remove undesirable vegetation during construction that would interfere with transmission line safety and reliability as described in **Appendix B**. The desired condition would be a ROW dominated by grasses, forbs, shrubs, and lower-growth tree species that would not interfere with the transmission line.

Along the routing north of Newell Lake View subdivision, the new ROW would result in an open, linear feature in an area currently characterized by an existing closed canopy. Removing most tree species would result in the new ROW having a mix of shrub, herbaceous, slow growing tree species, and young trees over the long term. The new ROW would attract attention long-term compared to existing conditions, especially when parallel with the line of sight.

Following construction, roadways, landscaped areas, and undeveloped areas would be restored to their original condition and topography. Rocks, rock outcroppings, and debris would be replaced similar to pre-construction conditions to blend with the surrounding landscape. Infrastructure impacted by the construction would be restored to their previous function, and yards and pastures vegetated per landowner easements. These practices would reduce visual impacts along the alternative.

<u>Removal of Existing Transmission Line</u>

Alternative A (and B and C) would remove existing transmission structures and lines at or below ground level. Major beneficial effects would occur with the South Line ROW, or a combination of the two, being abandoned. The abandoned ROW would revegetate naturally and in 20 years the existing visual effects of a maintained ROW, pads, and access roads could diminish substantially, increasing the scenic quality and scenic integrity of the analysis area.

<u>Effects on Forest Service Visual Resource Objectives</u>

The USFS SIO of Moderate applies to compliance with existing resource planning on National Forest System lands only. Alternative A crosses National Forest System lands in Section 26, T5N, R72W along the North Line ROW with the view from KOP 6 filtered by trees and topography. Due to surrounding vegetation and topopgraphy, area views of the taller line would be limited to the immediate foreground (one structure) and up to four structures when looking parallel to the ROW. In Section 26, T5N, R72W, Alternative A descends a steep rock outcrop below The Notch on National Forest System land where access roads are non-existent. Road construction to meet safety requirements would occur, and would include cut and fill grading along a series of switchbacks. While the ROW through this area is not generally visible from USFS roads, it would potentially be seen by dispersed recreation users and from other viewpoints in the analysis area. The new double-circuit transmission line structures and conductors would be seen above the trees and would somewhat dominate the desired landscape character, but this dominance would be reduced with distance from the viewer. The new structures and ROW maintenance would equate to a Very Low SIO on National Forest System lands as seen from Pole Hill Road in the foreground (0 to 0.5 mile) and some middleground (0.5 to 4 miles) locations. Elsewhere, long-term beneficial effects would result from removal and abandonment of the South Line and ROW that parallel Pole Hill Road for approximately 1 mile. The long-term beneficial effect of removing and abandoning the South Line and ROW would partially offset the visual impact of rebuilding the North Line. For USFS planning objectives, selection of this alternative would require lowering the (SIO) from Moderate to Very Low and documentation of the change of SIO in MA 8.3 - Utility Corridor for this project area, in accordance with Forest Plan Standard 154 and also documentation in the USFS ROD for the project.

Alternative A crosses National Forest System lands in Section 27, T5N, R71W along the existing north ROW (see KOP 7). Taller, heavier-appearing structures that would be visible above the tree canopy would result in moderate adverse incremental impacts to scenic integrity. Vegetation maintenance would create more contrast than the existing conditions (**Table 4.12-1**). The ROW and up to three structures would be visible east-west at three crossings along Pole Hill Road. The landscape character would appear incrementally altered at these crossings where views are oriented parallel to the line of sight and where the typical screening is absent. The eastern two crossings would be located at recent CBT improvements in an area where the existing landscape character already appears moderately altered. Long-term beneficial effects would result from removal and abandonment of the South Line and ROW that parallel Pole Hill Road for 0.3 mile. Overall, the valued landscape character would appear incrementally altered across the majority of this section, with the structures and the ROW partially screened when not adjacent to Pole Hill Road. Alternative A would equate to a Very Low SIO as seen from Pole Hill Road in the foreground (0 to 0.5 mile) and some middleground (0.5 to 4 miles) locations. Long-term beneficial effects would result from removal and abandonment of the South Line and ROW that parallel Pole Hill Road for approximately 1 mile. The long-term beneficial effect of removing and abandoning the South Line and ROW would partially offset the visual impact of rebuilding the North Line. For USFS planning objectives, selection of this alternative would require lowering the SIO from Moderate to Very Low and documentation of the change of SIO in MA 8.3 - Utility Corridor for this project area, in accordance with Forest Plan Standard 154 and also documentation in the USFS ROD.

4.12.5.2 Variant A1

Variant A1 is identical to Alternative A except for the westernmost segment where the route would depart from the existing North Line and traverse along the base of Mount Pisgah and then parallel U.S. Highway 36. Variant A1 would be most frequently seen from the Estes Valley. Impacts for Variant A1 would be less than Alternative A, as Variant A1 crosses at an angle where the lower, new ROW would be screened from view, thereby reducing the “corridor effect” (see KOPs 1 and 2). In particular, narratives presented in **Tables 4.12-1a-e** describe potential impacts at KOP locations for the corresponding Variant A1 alignment depicted in **Figure 4.12-3**. Simulations of Alternative A1 can be found in **Appendix C**.

As noted in Section 2.2.2, Description of Transmission Facilities, structures with a shorter average height of 85 feet and shorter average span of 700 feet, would be considered where visibility from sensitive viewpoints is a major concern, including from Park Hill and Newell Lake View subdivisions and some segments of USFS lands. The shorter structures would be approximately 20 feet shorter on average than the taller 105-foot structures, with the trade-off that the use of shorter structures would result in roughly twice the number of structures in a given length of ROW due to the shorter span. Long-term beneficial effects would occur where the existing lines would be removed along Mall Road and the Big Thompson River below Lake Estes. The abandoned portion of the existing ROW at the foot (talus slope) of Mount Olympus would be revegetated over time. Effects on USFS visual resource objectives would be as described for Alternative A.

4.12.5.3 Variant A2

Variant A2 is similar to Alternative A except for the westernmost segment where the route would be constructed underground following a new alignment that avoids forested areas. Impacts for Alternative Variant A2 for would result from surface disturbance associated with burying the transmission line. In particular, narratives presented in **Tables 4.12-1a-e** describe potential impacts at KOP locations for the corresponding Variant A2 alignment depicted in **Figure 4.12-4**. Short-term visual impacts from underground construction activities would be more intense compared to overhead construction. During operation, vegetation management for the underground route would require a 75-foot ROW where trees and large shrubs would not be allowed. The maintained ROW would have substantially different color, texture, and forms than the adjacent undisturbed areas. Because no woody trees or shrubs would be permitted to grow in the ROW, the ground plane of this underground ROW would attract more attention than the ground plane of an overhead ROW This effect would be apparent in Sections 28 and 29, T5N, R72W, since there is approximately 1 mile of forested private land with the remainder consisting of shrub mosaics (see Section 4.7, Vegetation). Where the ROW ground plane is screened from view, impacts would be not be seen. Impacts would exist where the ROW ground plane is open to view. These effects can be moderated by implementing the vegetation management strategies in Section 2.5.1.2. Compared to overhead construction in the same vicinity, Variant A2 would have less impacts.

A pair of transition structures, approximately 100 feet tall and 5 feet wide at the base, would be constructed at each termination site. The eastern transition structures on private land at the USFS boundary would not be visible from public roads, though potentially from dispersed USFS users. The western transition structures at the intersection Mall Road and U.S. Highway 36 would attract the attention of viewers at Lake Estes, U.S. Highway 36, and Mall Road to a greater degree than the existing lattice tower that they would connect to.

Following construction, roadways, landscaped areas, and undeveloped areas would be restored to their original condition and topography, except for access ways to the underground service vaults that would be installed along the buried cable conduits. Rocks, rock outcroppings, and natural forest debris would be replaced similar to pre-construction conditions to blend with the surrounding landscape. Infrastructure impacted by the construction would be restored to their previous function, and yards and pastures vegetated per landowner easements. These practices would reduce visual impacts along the alternative. Vaults would be visible on the ground plane at intervals along the underground segment. Permanent surface monuments installed to mark the easement centerline would be visible but would not attract attention.

Figure 4.12-4 displays the viewshed analysis of Variant A2. Simulations of Variant A2 can be found in **Appendix C**. The transmission line would be constructed overhead on National Forest System lands and the effects on USFS visual resource objectives would be as described for Alternative A.

4.12.5.4 Alternative B

Short- and long-term direct effects to the analysis area from Alternative B would be similar to the effects described under Impacts Common to All Alternatives and Alternative A. **Tables 4.12-1a-e** and **Figure 4.12-5** describe the potential impacts by KOP and viewshed analysis of Alternative B. Simulations of Alternative B can be found in **Appendix C**.

The Project would be rebuilt on an existing ROW and would replace an existing line. Incremental visual impacts would be related to a taller steel monopole line, with fewer structures compared to the existing line. Corresponding long-term adverse effects would occur to Chimney Hollow Open Space; views of Pinewood Reservoir and the Ramsay-Shockey Open Space; Park Hill, Meadowdale Hills and Ravencrest subdivisions, and 0.75-mile of U.S. Highway 36 entering Estes Park. West of The Notch along Pole Hill Road, Alternative B would cross higher elevations and be skylined at several locations compared to Alternative A.

As noted in Section 2.2.2, Description of Transmission Facilities, structures with a shorter average height of 85 feet and shorter average span of 700 feet, would be considered where visibility from sensitive viewpoints is a major concern, including from Meadowdale Hills subdivision and some segments of USFS lands. The shorter structures would be approximately 20 feet shorter on average than the taller 105-foot structures, with the trade-off that the use of shorter structures would result in roughly twice the number of structures in a given length of ROW due to the shorter span. Removal and abandonment of the North Line would result in long-term, moderate beneficial effects to the valley between Mount Pisgah and Mount Olympus as seen throughout the Estes Valley, and to the residential and recreation settings of Pole Hill Road east of Pole Hill Substation and the Big Thompson River below Lake Estes.

<u>Effects on Forest Service Scenic Integrity Objectives</u>

Effects from Alternative B on National Forest System lands in Section 27, T5N, R71W would be the same as Alternative A.

Along the South Line ROW on National Forest System lands in Sections 34 and 35, T5N, R72W, Alternative B would be similar to Alternative A. Alternative B generally parallels 1 mile of Pole Hill Road and crosses it at five locations. These crossings would allow for longer distance views of the ROW (see KOP 6 and KOP 14). Under existing conditions, the scenic integrity at these KOPs is Moderate and Low, respectively (**Table 4.12-1**). While the moderate adverse incremental impacts from views of the taller structures would be limited to the immediate foreground, Alternative B's proximity to high volumes of traffic on Pole Hill Road could impact the visual experience of a greater number of sensitive viewers than Alternative A.

Long-term, moderate beneficial effects would occur by removing the North Line and abandoning the ROW because it would eliminate the ROW below The Notch. To the south, the landscape character would appear moderately altered in the foreground and some middleground views of Alternative B, and meet a Very Low SIO. The long-term beneficial effect of removing and abandoning the North Line and ROW would partially offset the visual impact of rebuilding the South Line. To comply with USFS planning, selection of this alternative would require lowering the SIO from Moderate to Very Low and documentation of the change of SIO in MA 8.3 – Utility Corridor for this project area, in accordance with Forest Plan Standard 154 and also documentation in the USFS ROD.

4.12.5.5 Alternative C

Short- and long-term direct effects to the analysis area from Alternative C would be very similar to the effects described under Impacts Common to All Alternatives and Alternative A. **Tables 4.12-1a-e** and **Figure 4.12-6** describe the potential impacts by KOP and viewshed analysis of Alternative C. Simulations of Alternative C can be found in **Appendix C**.

From The Notch to U.S. Highway 36, impacts from Alternative C would be the same as Alternative B. Alternative C would create stronger, localized contrasts than the existing line in the immediate foreground of residences of the Meadowdale Hills, Ravencrest, and Park Hill subdivisions, and along Pole Hill Road east of Pole Hill Substation. Adjacent to U.S. Highway 36 at the Ravencrest Heights subdivision, an angle structure would be skylined before Alternative C descends in a drainage 0.1 mile downslope of the highway. At the Estes Park overlook along U.S. Highway 36, the top of Alternative C would be located below the overlook and partially to fully screened by trees and the highway embankment.

As noted in Section 2.2.2, Description of Transmission Facilities, structures with a shorter average height of 85 feet and shorter average span of 700 feet, would be considered where visibility from sensitive viewpoints is a major concern, including from Park Hill subdivision, Meadowdale Hills subdivision, and/or Newell Lake View subdivision and some segments of USFS lands. The shorter structures would be approximately 20 feet shorter on average than the taller 105-foot structures, with the trade-off that the use of shorter structures would result in roughly twice the number of structures in a given length of ROW due to the shorter span.

Long-term, moderate beneficial effects would occur where the existing lines would be removed at Pinewood Reservoir, U.S. Highway 36, the Big Thompson River below Lake Estes, and along Mall Road. Recreationist views of Pinewood Reservoir and Ramsay-Shockey Open Space would benefit from the South Line's removal; residences at Newel Lake View subdivision would be both beneficially and adversely impacted. Significant beneficial effects would occur in the central and southwestern portion of the Newel Lake View subdivision where the existing transmission line would be removed; conversely, residents at the southern perimeter of Newell Lake View subdivision along East Pole Hill Road would be adversely affected by the relocated alignment (see KOP 8, **Table 4.12-1**). These would be negligible to moderate adverse impacts, depending on viewer location. Views of the valley between Mount Olympus and Mount Pisgah from Estes Park and National Forest System lands would be improved.

Effects on Forest Service Visual Resource Objectives

Moderate adverse incremental effects from Alternative C on National Forest System lands in T5N, R71W, Section 27 would be the same as Alternative A (see KOP 7, **Table 4.12-1**). On National Forest System lands in Sections 34 and 35, T5N, R72W, moderate adverse incremental effects from Alternative C would be the same as Alternative B. To comply with USFS planning, selection of this alternative would require lowering the SIO from Moderate to Very Low and documentation of the change of SIO in MA 8.3 - Utility Corridor for this project area, in accordance with Forest Plan Standard 154. Documentation in the USFS ROD for the Project also would be required.

4.12.5.6 Variant C1

Variant C1 is similar to Alternative C except for the westernmost segment where the route would be constructed underground following a new alignment from the intersection of U.S. Highway 36 and Mall Road to the USFS boundary adjacent to the Meadowdale Hills subdivision. The short- and long-term ROW of Variant C1 would have a visual appearance similar to Variant A2; however, it crosses 1 mile more of Ponderosa Pine woodland more than Variant A2. Variants A2 and C1 follow the same alignment to the intersection of a Crocker Ranch access road. Adverse effects from transition structures above Meadowdale Hills subdivision near the USFS boundary would not be visible from the majority of Meadowdale Hills subdivision and U.S. Highway 36, but visible to West Pole Hill Road users, recreationists, and homeowners above Meadowdale Hills near the USFS boundary. Because no woody trees or shrubs would be permitted to grow in the ROW, the ground plane of the underground ROW would attract more attention than the ground plane of an overhead ROW. Where the ROW ground plane is screened from view, impacts would be not be seen. Impacts would exist where the ROW ground plane is open to view. For example, beneficial effects would occur to Meadowdale Hills residents adjacent to the ROW, however, the absence of trees and shrubs in the ROW would be noticeable from residences and from U.S. Highway 36.

Figure 4.12-7 displays the viewshed analysis of Variant C1. In particular, narratives presented in **Tables 4.12-1a-e** describe potential impacts at KOP locations for the corresponding Variant C1 alignment depicted in **Figure 4.12-7**. Simulations of Variant C1 can be found in **Appendix C**. The transmission line would be constructed overhead on National Forest System lands and the effects on USFS visual resource objectives would be as described for Alternative C.

4.12.5.7 Alternative D

Alternative D would rebuild the two existing single-circuit 115-kV transmission lines using wood H-frame structures, new hardware and conductors – essentially identical in appearance to the existing conditions though potentially 5 to 10 feet taller where needed to meet safety requirements. The existing, adverse visual effects and visibility of Alternative D shown in **Figures 4.12-8** would continue to be the same as the No Action Alternative, except as noted below. In particular, narratives presented in **Tables 4.12-1a-e** describe potential impacts at KOP locations for the corresponding Alternative D alignment depicted in **Figure 4.12-8**.

Visual changes during construction would be more intensive but of shorter duration than the No Action Alternative. All facilities would be replaced in a definite time period of less than 1 year rather than gradually over an extended period of time.

Western would remove all undesirable vegetation and trees during construction that would interfere with transmission line safety and reliability as described under Impacts Common to All Alternatives, project-specific design criteria in Chapter 2.0, and in **Appendix B**. Road construction would occur in very steep terrain to meet safety requirements in locations where no access roads appear to be presently feasible, such as west of Pole Hill Substation in Sections 26 and 27, T5N, R71W along the South Line; below The Notch in T5N, R72W, Sections 26 and 27 along the North Line; and near Pole Hill Road in Section 34, T5N, R72W along the South Line. The grading, cut and fill would attract visual attention. Also, new conductors and overhead groundwires would be installed with Alternative D, initially creating additional visual contrasts until the conductors become oxidized with time; however, to the extent possible, Western would utilize non-specular conductors and non-reflective coatings on insulators to reduce glare from transmission conductors and insulators (Section 2.5.3). With the No Action Alternative, the conductors would only be replaced following failure, and then only in segments. Therefore, the long-term appearance of Alternative D would be similar in color, texture, line, and form to the No Action Alternative. Alternative D would only differ from the No Action Alternative in minor changes due to access road and vegetation management activities.

Over the long-term, annual operations and maintenance activities would be similar to those that have occurred for decades, though less frequent with fully rebuilt transmission lines and new vegetation management standards.

Rebuilding the North or South lines as a single-circuit H-frame would have less adverse visual impact than Alternatives A, A1, B, or C because viewers are accustomed to seeing the existing transmission lines. When seen in the same view (i.e., when the two lines are in proximity to each other) the adverse visual effects of two rebuilt single-circuit transmission lines would be similar to the long-term effects of a consolidated Alternative A, A1, B, or C. There are several reasons: non-existent access roads would need to be constructed in steep terrain, some structures would be 5 to 10 feet taller, and Western would clear immature trees to meet the new vegetation management standard when implemented.

Effects on Forest Service Scenic Integrity Objectives

For Alternative D, the rebuilt transmission lines would meet the USFS Adopted SIO of Moderate on National Forest System lands, similar to the No Action Alternative.

4.12.6 Mitigation

The most effective mitigating strategy for scenic resources is proper siting, ROW management, and structure design. Visual considerations identified though public scoping and field observations were a major factor in refinement of the alternatives and selection of transmission structures during the EIS process. Project EPMs, when combined with the SCPs and project-specific design criteria (Section 2.5), would further reduce the visual contrast created by the action alternatives. No additional mitigation measures are recommended.

4.12.7 Residual Impacts

Residual impacts would continue but to a lesser degree with implementation of visual resource EPMs described in Section 2.5.2. All transmission alternatives and practices (including reduced glare and color contrast from conductors, insulators, and structures) would result in minor to significant impacts, reducing scenic quality and scenic integrity throughout the operational life of the Project in some areas, and by improving these parameters in other areas. Abandoned ROWs would continue to attract visual attention until successful reclamation has occurred. Adverse impacts would be reduced as much as possible by implementing the project design criteria and other practices or measures described in Chapter 2.0.

4.12.8 Irreversible and Irretrievable Commitment of Resources

Although scenic quality would be diminished in some areas by Alternatives A, B, C, and the variants, these impacts are not considered irreversible or irretrievable. Project effects would likely persist for many years but could be reversed by removal of the structures and rehabilitation of the ROW. Beneficial impacts elsewhere would not create irreversible and irretrievable commitments of resources.

4.12.9 Relationship between Short-term Uses and Long-term Productivity

Action alternatives would result in the long term incremental degradation of scenic resources within the project area along parts of the selected route, which would be offset to varying degrees by removal and consolidation of the two existing lines. Short-term productivity would be affected with greater intensity than long-term productivity, until reclamation occurs and sensitive viewers become accustomed to the project's visibility. For areas with low reclamation potential or slow revegetation rates, long-term productivity losses to scenic character would continue beyond the period of construction, operation, and maintenance activities. The decrease in scenic quality through direct impacts (i.e., ROW clearing) could adversely affect visual aspects of recreation activities and land uses in and around the Project over the long term. These effects would be offset to varying degrees by vegetation recovery on abandoned ROW, and by reduced maintenance activities compared to existing conditions.

4.13 Socioeconomics and Environmental Justice

The analysis area for socioeconomics and environmental justice is Larimer County and more specifically, Estes Park and Loveland where applicable.

<u>Social and Economic Values</u>

Primary issues associated with social and economic value impacts are effects on economic activity as measured by changes in employment and earnings, changes in populations, and changes in the demand for housing and community services.

The following additional issues related to socioeconomics were identified during the scoping process:

- Maintenance of aesthetic values.
- Effects of the proposed project on property values.
- Effects of the proposed project on sources of revenue from tourism and outdoor recreation.

<u>Environmental Justice</u>

Issues regarding environmental justice involve having disproportionately high and adverse impacts on minority or low-income populations caused by constructing and operating the proposed project.

4.13.1 Methodology

4.13.1.1 Social and Economic Values

Socioeconomic impacts of the Project were evaluated by examining the availability of labor, potential changes in local population and property values, and changes in demand for housing and community services. In addition, the number of homes within 100 feet of the alternative ROWs is reported to provide a basis for comparison of the number of properties that may be affected by changes to their property value.

4.13.1.2 Environmental Justice

Census data were collected at the census block group, county, and state levels. A comparison of affected census block groups (race) and census tracts (income) was made to determine whether minority or low income populations would experience disproportionately high and adverse effects from the construction and/or operation of the Project.

4.13.2 Significance Criteria

A significant impact on socioeconomics values would result if any of the following were to occur from constructing or operating the Project:

- An increase in population that would create shortages of housing and place an excessive burden on local services.
- Permanent displacement of an existing residence or business.

- Long-term loss of economic viability of a ranch or other business.
- Permanent and irreversible loss of work for a major sector of a community.
- Substantial economic benefit (a positive economic impact could be considered significant).
- A substantial disproportionate effect on minority or low-income populations in the area.

4.13.3 Impacts Common to All Alternatives

The primary socioeconomic and environmental justice impacts that would occur would apply to all alternatives. Direct and indirect impacts would include slight, short-term increases to the local population from construction crews. The influx of construction crews would have a beneficial impact on the economic base of local communities such as Loveland and Estes Park, as construction workers would spend some income on lodging and other local services (maintenance under the No Action Alternative would be conducted by Western's local maintenance team in lieu of a contract work force).

Long-term effects would be associated with property values and would vary by alternative.

4.13.3.1 Population

Direct and indirect economic benefits to the surrounding area from construction expenditures would be a beneficial impact, creating and sustaining local jobs within the community.

The transmission lines rebuild would temporarily employ approximately 10 to 15 construction personnel. Construction personnel would primarily use temporary housing at local motels in the area, although some workers may be local and would utilize their own residence. The number of construction employees would be negligible and would have a less than significant impact on the local population or housing in the analysis area.

4.13.3.2 Economic Base

Construction of the transmission lines rebuild would provide some additional incremental employment opportunities in the region. It is anticipated that workers would spend a portion of their income in local communities on meals and potentially lodging, resulting in an incremental beneficial effect to local businesses during construction activities. In accordance with SCP 38, ROW would be purchased at fair market value and payment made for any agriculture or other property damages during construction or maintenance.

Short-term effects under the action alternatives would occur primarily during construction and would be mostly limited to a slight increase in the construction work force and beneficial impacts from associated spending in the local community. These impacts would be short-term and end after construction is completed. The presence of construction vehicles and construction personnel along the transmission line ROWs would result in minor short-term impacts to aesthetic values, recreation, and tourism activities during construction.

Long-term effects would be associated with property values. A review in the Journal of Real Estate Literature examined empirical studies on the effects of electric transmission lines on property values (Jackson and Pitts 2010). These published studies, documented in Jackson and Pitts 2010, ranged from 1964 to 2009. Most studies found no effect to property values, which was attributed to the addition of open space contributed by the transmission line easement. Additionally, in the case of this Project, many of the residences have property values that have taken into account the presence of the transmission lines because they have been built near or have easements for the existing transmission lines. Aesthetic values and recreation-based tourism would be positively impacted from line decommissioning under all action alternatives that consolidate two ROWs by constructing a double-circuit transmission line. Additional long-term effects would include more reliable electrical transmission to the Estes Park area with a decreased risk of power outages and a decrease in maintenance costs. Under Alternative D, long-term effects would include the continued use of two ROWs and lack of socioeconomic benefits that would accrue from consolidating two ROWs into one.

No significant adverse impacts are anticipated from permanent displacement of an existing residence or business, long-term loss of economic viability of a ranch or other business, or permanent and irreversible loss of work for a major sector of the community.

4.13.3.3 Environmental Justice

The poverty rates and minority population percentages for the census tracts affected by the Project are shown in **Table 3.13-9**. The poverty rates and minority population percentages for the analysis area are less than or comparable to rates for the state, as is reflected by the amount of second homes within the Project area. Therefore, it has been determined that environmental justice populations are not present within the Project area and the Project would not have a disproportionately high and adverse effect on minority or low-income populations.

4.13.4 No Action Alternative

Under the No Action Alternative, impacts would include increased maintenance costs as replacement of the existing structures would be accelerated. There would be no direct or indirect effects on population, economic base, property values, aesthetic values, recreation or tourism-based sources of revenue, or environmental justice. The exception would be the potential for a slight increase in property values within the Newell Lake View subdivision where the line would be removed and the ROW rerouted to Pole Hill Road. Conversely, those areas of the Newell Lake View subdivision near Pole Hill Road where the ROW would be rerouted might see a slight reduction to property values; however compensation for the ROW easement should offset any impact. **Table 4.13-1** depicts the number of landowners affected by new ROW, widened ROW, and ROW removal for each alternative.

Table 4.13-1 Landowners Affected by Each Alternative

Resource	Alternative A	Variant A1	Variant A2	Alternative B	Alternative C	Variant C1	Alternative D	No Action Alternative
Total number of. landowners burdened by ROW acquisition	46	48	42	19	36	36	40	40
New ROW	8	10 (*1)	7 (*1)	4 (*2)	9	9	5 (*2)	5 (*2)
Widened ROW	38	38	35	15	27	27	35	35
Number of landowners where ROW removed (*3)	36	36	36	51	33	33	7	7

*1 Includes new road ROW/construction on Crocker through Noels Draw.

*2 Includes new Road ROW on southwest side of U.S. Highway 36.

*3 Some landowners benefit by the removal of one line but are still burdened by the other line.

Under the No Action Alternative, short- and long-term adverse effects would include both an increase in maintenance costs as well as increasingly unreliable electrical service because the existing line would become more intensive to maintain. There would be no short-term or long-term effects on population, economic base, aesthetic values, recreation or tourism-based sources of revenue, and environmental justice. Long-term effects include potential changes to property values within the Newell Lake View subdivision where the ROW would be rerouted to Pole Hill Road, as noted above. Short-term effects would include negligible increases in economic input to the local economy from construction expenditures to reroute the transmission line out of Newell Lake View subdivision. This increase in economic input into the local economy would diminish as maintenance activities are completed.

4.13.5 Impacts Unique to Specific Action Alternatives

Property Values

While no studies have been done in the specific analysis area, various studies have been conducted to determine the effect of transmission lines on the value of single family residences in residential subdivisions. As previously noted, based on research of a compilation of studies regarding the effects of transmission lines on property values, most studies found no effect to property values, which was attributed to the addition of open space contributed by the transmission line easement (Jackson and Pitts 2010). When new or expanded easements are required, property owners are compensated for the new ROW easement at fair market value, which should offset impacts to property values. Any real property value impact generally fades after a few years as a new line becomes a part of the landscape of human development. A number of the studies found no effect, while in some cases a slight increase was observed. Increases were attributed to the additional open space usually behind the residences created by the transmission line easement. Impacts to property values would vary by alternative, but would generally be negligible where the transmission line would be rebuilt within an existing transmission line easement that has been in place for over 60 years.

Alternative A

Under Alternative A, the existing transmission line along the South Line would be removed from the ROW and the ROW decommissioned through the Meadowdale Hills, Ravencrest, and Newell Lake View subdivisions, resulting in the release of easement rights thereby causing a potentially slight increase in property values at those locations. The new structures through the Park Hill subdivision on the western end of the alternative are anticipated to be 10 to 20 feet higher than the existing structures within an existing easement. Portions of the existing easement would need to be expanded or would require acquisition of new easements. Impacts to property values crossed by Alternative A would be decreased because the new transmission line would rebuild within an existing transmission line that has been in place for over 60 years. **Table 4.13-1** depicts the number of landowners affected by new ROW, widened ROW, and ROW removal. Residences, whose property is encumbered by existing easements within the Meadowdale Hills and Ravencrest, where the existing line would be removed, potentially would experience a slight increase in property value because the existing lines would be removed, the easement rights would be released, and the ROW would return to natural vegetation patterns, constituting minor beneficial impacts. Western would retain its rights to the ROW through Newell Lake View subdivision following decommissioning of the existing line in order to maintain a single-pole fiber optic communications connection with Pinewood Dam.

In addition, if construction activities were to occur during the primary recreational use period (May 15 to October 15), there would be short-term, adverse effects to the operations of an outfitter authorized to provide four-wheel drive tours in the West Pole Hill Area. The outfitter holds a Priority Outfitter/Guide special use authorization allowing 3,575 service days annually with an average use of 1,800 to 2,000 service days per year. A service day constitutes a day or any part of a day on National Forest System lands for which an outfitter or guide provides services to a client. The number is calculated by multiplying each service day by the number of clients on a trip. They offer morning and afternoon tours daily and evening tours 4 days a week. Although difficult to quantify until the construction schedule is more specifically defined, conflicts between construction activities associated with removal of the existing South Line and outfitter use of Pole Hill Road may emerge. Structure removal activities would utilize smaller vehicles than construction installation activities and would not block West Pole Hill Road from access; however, use of West Pole Hill Road would still result in minor short-term adverse impacts.

<u>Alternative B</u>

Under Alternative B, the existing North Line would be removed from the ROW through the north and west sides of the Park Hill subdivision and the existing ROW through Newell Lake View subdivision, resulting in the potential for a slight increase of property values. These would be minor beneficial impacts at those locations. In the Meadowdale Hills and Ravencrest subdivisions, the existing H-frame wood pole structures would be replaced by steel monopole structures that would be 10 to 30 feet higher within an existing ROW, depending on the span length designed for the transmission line. **Table 4.13-1** depicts the number of landowners affected by new ROW, widened ROW, and ROW removal. The taller structures along U.S. Highway 36 would incrementally increase adverse impacts on aesthetic values, recreation, and tourism activities. However, these impacts would be minor as a result of the long-term presence of H-frame structures that have been within the existing ROW for over 60 years. See Section 4.12 for further discussion of visual impacts.

If construction activities were to occur during the primary recreational use period (May 15 to October 15) there would be adverse effects to the private outfitter, which is authorized to provide four-wheel drive tours in the Pole Hill area. As noted in Alternative A, these effects would be short-term.

<u>Alternative C</u>

Under Alternative C, the existing transmission line would be removed from the North Line ROW through the Park Hill subdivision and the ROW would be decommissioned. At Newell Lake View subdivision, the ROW through the subdivision would be relocated to follow Pole Hill Road. Property values could increase slightly within the north and west sides of the Park Hill subdivision and the Newell Lake View subdivision where the existing line would be removed. These would be minor beneficial impacts at those locations. Where new ROW would be required, property owners impacted by the new ROW would be compensated. In the Meadowdale Hills and Ravencrest subdivisions, the existing H-frame wood pole structures would be replaced by steel monopole structures that would be 10 to 30 feet higher within an existing ROW, depending on the span length designed for the transmission line. **Table 4.13-1** depicts the number of landowners affected by new ROW, widened ROW, and ROW removal. The placement of taller structures would incrementally decrease impacts on aesthetic values, recreation, and tourism activities as a result of the location of structures away from U.S. Highway 36 to the north. Adverse impacts would be minor as a result of the long-term presence of H-frame structures that have been within the ROW for over 60 years.

Alternative C would reconstruct sections of USFS Roads 122 (Pole Hill Road), to allow for passage of semi-trailer trucks to structure locations. Under this alternative, grinding, chipping, or blasting could be used to level the grade on the end of West Pole Hill Road. Reconstruction of West Pole Hill Road would diminish the four-wheel drive recreation experience on USFS Road 122, particularly on the most challenging four-wheel drive section just east of the road closure gate accessed from Meadowdale Hills subdivision.

One permittee runs tours in the Pole Hill area and has authorized permanent facilities (observation tower, picnic shelter with cooking facilities, toilet/washing/generator building, storage building) at the top of Panorama Peak. Tours are advertised as four-wheel drive/off-road tours with the most challenging four-wheel drive section of the entire route being the steep, rock section just east of the road closure gate on West Pole Hill Road. Alternative C would degrade the four-wheel drive experience on a key road used for four-wheel drive activities, USFS Road 122, but would not completely displace the outfitter, who would continue to have access to a network of unimproved roads in the Pole Hill area. Although, there would be no direct adverse effects to the permittee’s permanent facilities and other USFS roads in the Pole Hill area (e.g., USFS Roads 122A, 247, 247A, 247B, and portions of 247D) would remain unimproved and accessible for four-wheel drive use, overall, the economic adverse effects to this permittee are anticipated to be significant, short-term, and long-term.

Alternative D

Under Alternative D, the rebuild of the existing lines would not affect property values. Property values could increase incrementally within the Newell Lake View subdivision where the existing H-frame line would be removed; however, Western would retain its rights to the ROW through Newell Lake View subdivision following decommissioning of the existing line in order to maintain a single-pole fiber optic communications connection with Pinewood Dam. However, property owners impacted by the new ROW along the southern boundary of the subdivision where the new line would be constructed near Pole Hill Road may experience a slight decrease in property values, constituting a minor adverse effect. **Table 4.13-1** depicts the number of landowners affected by new ROW, widened ROW, and ROW removal.

Variant A1

Variant A1 represents an alternate route through private ranch land on the western end of the Project area. The routing variant rejoins existing ROW on the south side of Park Hill subdivision. **Table 4.13-1** depicts the number of landowners affected by new ROW, widened ROW, and ROW removal. Impacts would be similar to those described for the action alternatives and Impacts Common to All Alternatives. The new structures would incrementally increase adverse minor impacts on aesthetic values, recreation, and tourism activities; however, these impacts would be minor as a result of the long-term presence of H-frame structures that have been within the existing ROW for over 80 years.

Variant A2

Variant A2 would follow the same alignment as described for Alternative A and build the line aboveground over most of this distance. The westernmost portion of this alternative would be constructed underground following a new alignment that heads south from the existing transmission line to the intersection of Mall Road and U.S. Highway 36. Preliminary construction cost estimates of Variant A2 are approximately $45.4 million. This is roughly 473 percent greater than alternatives that do not have an underground option. Further costs are detailed in **Table 2.4-1**, Section 2.4. Properties where aboveground transmission lines would be removed would experience minor beneficial impacts from increased property values.

Variant C1

Variant C1, from Mall Road to the USFS boundary adjacent to the Meadowdale Hills subdivision, would be constructed underground to lessen visual concerns. This section would run slightly less than three miles in length. Preliminary construction cost estimates of Variant C1 are approximately $42.6 million. This is roughly 470 percent greater than alternatives that do not have an underground option. Changes in four-wheel drive conditions also would occur as described for Alternative C; the adverse economic effects to the four-wheel drive permittee are anticipated to be significant, short-term, and long-term for Variant C1. Properties where aboveground transmission lines would be removed would experience minor beneficial impacts from increased property values.

4.13.6 Mitigation

After implementing SCP 38, there would be no significant impacts to socioeconomics or environmental justice as a result of landowner loss of revenue. There would be no other significant impacts under most alternatives. No mitigation measures have been proposed.

4.13.7 Residual Impacts

From a social and economic perspective, any residual effects would primarily be long-term in nature and very localized. Residual long-term socioeconomic impacts could include effects on property values. However, many of the residences have property values that have taken into account the presence of the transmission lines because the homes were built near the easements of the existing transmission lines, and any effects on property values are expected to be minor. Residual social effects would be associated with the change in character of the landscape in and near the analysis area, which could be viewed as adverse or beneficial to different local residents and other users of the land. Direct long-term impacts pertain mostly to property values. These effects would be beneficial in areas where transmission line easements and structures would be removed and potentially adverse where new easements are added, although property owners would be compensated based on fair market value for new easements. As a result of the historical long-term presence of transmission structures within the ROWs, these impacts are anticipated to be minor. **Table 4.13-1** depicts the total number of landowners affected by new ROW, widened ROW, and ROW removal.

Residual direct long-term socioeconomic impacts also would include effects to the a recreation permittee, as four-wheel drive portions of West Pole Hill Road under Alternative C and Variant C1 would be improved, degrading the four-wheel drive experience. Under Alternative C or Variant C1, adverse economic effects to this business would be anticipated to be significant and long-term.

4.13.8 Irreversible and Irretrievable Commitment of Resources

Implementation of the Project would require the commitment of natural, human, engineered, and monetary resources. After completion, most of the resource investments would be irretrievable and their use/application for this Project would preclude their use for other purposes; however, some Project components such as poles, conductors, and ground wire may be recycled into other uses. Resource investment would result in the benefits of safe, reliable power.

4.13.9 Relationship Between Short-term Uses and Long-term Productivity

Implementation of the Project would involve a series of temporary use of land and other resources, as well as long-term influences on land use, economic activity, and social setting along the alternatives. Reliable energy transmission would contribute to long-term productivity gains.

4.14 Electrical Effects and Human Health

The impact analysis area for electrical effects and human health includes the alternative ROWs and areas immediately adjacent to the ROW.

Issues or concerns regarding public health and safety identified by Western through internal scoping, consultation with coordinating agencies, or through comments provided during public scoping include:

- Adverse health impacts from EMF, as noted in Section 1.6.2.2 as an issue selected for detailed analysis, and stray voltage associated with transmission lines.
- Safety issues associated with transmission lines acting as a lightning rod.
- Safety issues associated with low flying helicopters.
- Risks to public safety from the application of pesticides to the ROW.
- Serious injuries to transmission line workers.
- Safety issues from the potential increase in wildfires, along with indirect health effects from fire suppression chemicals.

Methods to reduce impacts from wildfire are discussed in Section 4.7.5. The following discussion is related to potential impacts associated with the remaining identified issues.

4.14.1 Methodology

Existing regulations, safety standards, operational procedures and literature were reviewed. Industry practices are required to be protective of worker and public safety and health. Impacts associated with the proposed alternatives that could occur were assessed by comparing Projected activities and impacts with existing safety standards and regulations to protect public health. The analysis includes a comparison of the alternatives based on modeling using the Electric Power Research Institute Transmission Line Workstation Design Tool of the electric fields at the proposed edge of ROW (55 feet from centerline) measured in kilovolts/meter and magnetic fields at the edge of the ROW measured in mG.

4.14.2 Significance Criteria

A significant impact on public health or safety would result if any of the following were to occur from constructing and operating the Project:

- Interference with emergency response capabilities or resources.
- Serious injuries to: 1) workers, 2) visitors to the area, or 3) area land users.
- Creation of EMFs near an existing or proposed sensitive land use, such as schools or hospitals, which could potentially pose a plausible risk to human health.
- Creation of a substantial interference and disruption of emergency communications and electronic health/safety devices that results in substandard performance.
- Changes in traffic patterns that result in hazardous situations for motorists or pedestrians.

4.14.3 Impacts Common to All Alternatives

Potential direct and indirect impacts to human health and human environment could include effects from noise, radio and television interference, shocks, induced current and voltage, cardiac pacemakers, and EMF. Impacts also could occur from the use of helicopters to patrol the line. The impacts for all alternatives would be localized. With the exception of Variants A1, A2, and C1, and parts of Alternative A, these impacts would occur mostly within existing transmission line ROWs.

Radio and television interference as well as induced current and voltage also may be experienced, but would generally be at levels low enough not to cause adverse effects to communication sources, including emergency communications. Effects would be lessened through application of SCPs 20 and 39. SCP 20 would apply applicable mitigation to eliminate problems of induced currents and voltages onto objects within the ROW, while SCP 39 would ensure the power line would be designed to minimize noise and other effects from energized conductors. EMF effects on sensitive cardiac pacemakers and other sensitive receptors are rare, as a result of low levels of EMF and the lack of sensitive receptors, such as school and hospitals, within the ROW. Project SCPs 20 and 39, as well as low levels of EMF and the lack of sensitive receptors within the ROW would result in negligible short-term and long-term effects.

Primary shocks could result from direct contact with the transmission line conductors if construction trucks with booms or other tall equipment were operated near the transmission line. Caution would be exercised to avoid primary shocks resulting from line strikes with equipment. Furthermore, the transmission lines would be constructed and operated according to the NESC, which would minimize the risk for shock. Therefore, the short-term and long-term risk of resident or worker electrocution during construction as well as operation would be negligible. Furthermore, industry practices are required to be protective of worker and public safety would be closely adhered to. Primary shocks also can result from direct contact with objects installed by homeowners, such as radio masts or TV antennas; however, the risk has decreased markedly over the past decades with the advent of cable and digital TV resulting in negligible short-term and long-term effects.

Potential adverse human health effects associated with lightning strikes would be minimized by the presence of the overhead ground wire that shield the conductors; however, when current is discharged from the structure base to the surrounding ground, voltage can momentarily exist on the ground near the structure, thus presenting an electrocution hazard. Generally accepted safety measures regarding the dangers of close proximity to elevated structures during an electrical storm would apply, resulting in negligible short-term and long-term effects. When corona is present, the air surrounding the conductors is ionized and many chemical reactions take place, producing small amounts of ozone and other oxidants. The NAAQS for photochemical oxidants, of which ozone is the principal component, is 235 $\mu g/m^3$ or 120 ppb. The maximum incremental ozone levels at ground level calculated for the proposed line would be less than 0.02 ppb for a 0.5-mile-per-hour perpendicular wind and a .03-inch-per-hour rain. This would produce negligible short-term and long-term effects.

Direct and indirect adverse impacts also could occur from aerial line patrol utilizing helicopters. Western operates its aircraft under Federal Aviation Regulations Parts 135, 133, and 91 and is a member of the Helicopter Association International as well as an active member of Helicopter Association International's Utilities, Patrol, and Construction Committee, the organization that sets international guidelines for power line patrol and construction. Western would strictly follow these guidelines when performing aerial line patrol to minimize human health concerns. Effects from noise associated with construction helicopter activities are anticipated to be minor as a result of the short-term nature of the effect. Noise from helicopter construction activities would end when construction terminates. Noise accompanying standard periodic aerial line patrols would continue.

Traffic patterns and subsequent effects to emergency response, motorists, or pedestrians are expected to be less than significant as a result of what would be only a minor temporary increase in construction truck traffic, well within the capacity of the existing road network. Direct and indirect short-term and long-term impacts to human health resulting from constructing and operating the proposed transmission lines would be negligible.

4.14.3.1 Audible Noise

The average noise level during wet weather at the edge of the ROW for the aboveground alternatives and variants is anticipated to be 15 dBA at 115-kV (Minnesota Department of Commerce 2012). A soft whisper at 15 feet would be approximately 30 dBA, while a broadcasting studio would be near 20 dBA. It is anticipated that noise of 15 dBA at the edge of the ROW would constitute a negligible effect. Additionally, SCP 39 would be implemented to further lesson the adverse effects from noise by implementing modern power line design. SCP 17 would limit noise effects during construction or maintenance by requiring internal combustion engines be fitted with an approved muffler and spark arrester.

4.14.3.2 Radio and Television Interference

An acceptable level of maximum fair-weather radio interference at the edge of a ROW is 40 to 45 decibels above 1 microvolt per meter. Average levels during foul weather are typically 16 to 22 decibels higher than average fair-weather levels. The predicted fair-weather level for aboveground alternatives and variants is 36 decibels above 1 microvolt per meter. This is approximately 15 percent less than the maximum level considered acceptable resulting in short-term and long-term negligible effects.

Television interference due to corona effects occurs during periods of foul weather and generally is caused by aboveground transmission lines with voltage of more than 345-kV (all the alternatives maintain a voltage of 115-kV). The level of corona-operated television interference expected from the proposed rebuild is 16 decibels above 1 microvolt per meter at the edge of the ROW. This is a lower level than occurs on many existing lines and short-term and long-term effects would be considered negligible. Newer more modern transmission line equipment also would assist in limiting the likelihood of radio and television interference, as would the consolidation from two ROWs to one. Additionally, various techniques such as shielding for various electronic equipment exist for eliminating adverse impacts on radio and television reception. These measures would result in short-term and long-term negligible effects. Western would address individual complaints concerning radio and television interference, as needed.

4.14.3.3 Shocks

Primary shocks can occur from direct electrical contact with energized transmission line conductors. Caution should be exercised to avoid primary shocks resulting from direct contact with aboveground or buried lines with equipment (e.g., drill rigs, farm equipment, and electrical service equipment). The newer higher lines would present much less of a threat of primary shocks, than the existing lines which are nearer to the ground and utilize older conductors. Steady-state current shocks occur when a person touches an ungrounded object. Potential steady-state current shocks from vehicles under transmission lines would be at or below secondary shock levels. These secondary shocks could cause an involuntary and potentially harmful movement, but causes no direct physiological harm. Steady-state current shocks are infrequent and represent a nuisance rather than a hazard. Part of the construction process is to properly ground all metallic objects in and near the ROW, typically gates and fences. Typically issues arise when landowners unfamiliar with proper grounding install new fences, etc. after construction is completed. Proper grounding would greatly reduce the risk of steady-state current shocks.

4.14.3.4 Induced Current and Voltage

Induced currents and voltages near ungrounded objects represent a potential source of nuisance shocks near a high voltage transmission line. Even under worst case conditions, the short-circuit current resulting from induced voltage of the aboveground transmission line to the largest anticipated vehicle would be less than the NESC criterion of 5 milliampere. SCP 20 would be implemented to eliminate problems of induced currents and voltages onto conductive objects sharing the ROW.

4.14.3.5 Cardiac Pacemaker Effects

The interference threshold for the most sensitive pacemaker is estimated at 3.4-kV/m. The maximum induced electrical field of any of the proposed alternatives is estimated at 0.5-kV/m. Therefore, with operation at 115-kV capacity, the Project would not pose a risk to pacemaker wearers.

4.14.4 No Action Alternative

Under the No Action Alternative, impacts from new construction would be similar to those discussed under Section 4.14.3. In addition, impacts under the No Action Alternative would include continued impacts from existing power lines. **Tables 4.14-1** and **4.14-2** detail the existing EMF from the H-frame structures. Although the strength of the field decreases rapidly after 30 feet, there are some areas within the Newell Lake View subdivision where the ROW does not exceed 20 feet. Although at these distances electromagnetic fields would still be within recommended thresholds, these fields would stay in place until the existing line is relocated south of the subdivision near Pole Hill Road. Low EMF levels and the lack of sensitive receptors within transmission line ROWs would result in negligible effects. Noise impacts would result from maintenance activities as well as operation of the transmission lines, but effects would be lessened as a result of the transitory nature of construction.

Radio and television interference and induced current voltage are not expected to be affected as a result of implementation of SCPs 20 and 39 and the relatively low voltage of the transmission line. Short-term potential impacts to human health would be similar to those described under Impacts Common to All Alternatives. The majority of short-term impacts would result from maintenance activities as H-frame structures are replaced and maintenance activities near the Newell Lake View subdivision where the ROW would be re-routed along Pole Hill Road. Short-term impacts would include increased noise levels from maintenance activities.

Long-term adverse but minor effects would be associated with mostly radio and television interference, shocks, induced current and voltage, and EMF; however, low levels of EMF, implementation of SCPs, and lack of sensitive receptors within the ROW contribute to a negligible long-term effect. Under the No Action Alternative, long-term adverse effects also would include the continued use of two ROWs and subsequent potential for human health risks spread across two ROWs as the need for maintenance would increase.

4.14.5 Impacts Unique to Specific Action Alternatives

Unless noted otherwise, impacts in areas where the line would be buried on Variants A2 or C1 would be negligible.

4.14.5.1 Electric and Magnetic Fields

Transmission lines would be designed to minimize EMF and would have EMF levels similar to other existing 115-kV transmission lines. EMF strength depends on conductor capacity loads, voltage load and distance from source. The strength of the electric and magnetic fields decrease rapidly with distance. EMFs that are applicable to the 115-kV transmission lines that would be installed for the Project are provided in **Tables 4.14-1** and **4.14-2**, and are depicted in **Figures 4.14-1** and **4.14-2**. Electric fields for the double-circuit single pole transmission line alternatives (Alternatives A, B, and C and variants) would be approximately 70 percent less at the edge of the 110-foot ROW than the existing H-frame lines.

Table 4.14-1 Predicted Electric Fields from Proposed Aboveground Transmission Lines, Operated at Maximum Capacity (kilovolts per meter)

Pole Type	Distance (feet) from Centerline												
	-160	**-130**	**-100**	**-70**	**-55**	**-30**	**0**	**+30**	**+55**	**+70**	**+100**	**+130**	**+160**
H-frame, 115-kV[1]	0.02	0.05	0.08	0.25	0.34	0.70	0.50	0.70	0.34	0.25	0.08	0.05	0.02
Single-pole double circuit, 115-kV[2,3]	0.02	0.02	0.02	0.07	0.12	0.27	0.3	0.27	0.12	0.07	0.02	0.02	0.02

1 Applicable to the No Action Alternative and Alternative D.

2 Applicable to Alternatives A, A1, B, and C.

3 Single-pole structures differ in EMF strength due to conductor orientation.

Table 4.14-2 Predicted Magnetic Field from Proposed Aboveground Transmission Lines, Operated at Maximum Capacity (mG)

Pole Type	Distance (feet) from Centerline										
	-160	**-100**	**-70**	**-55**	**-30**	**0**	**+30**	**+55**	**+70**	**+100**	**+160**
H-frame, 115-kV[1]	1	2	4	5.2	12	23	12	5.3	4	2	1
Single-pole double circuit, 115-kV[2]	2	2	4	5.2	7	8	3	1.8	2	2	2

1 Applicable to the No Action Alternative and Alternative D.

2 Applicable to Alternatives A, A1, B, and C.

Magnetic field levels would be similar to the field levels of the existing H-frame at the edge of the ROW; however, the new double-circuit line would reduce magnetic field levels to less than the existing H-frame line within the 110-foot ROW. Note that EMF levels differ in strength on both sides of single-pole structures due to the configuration of conductors. Based on predicted estimates, EMFs are expected to diminish rapidly beyond 30 feet from the centerline. Magnetic fields within transmission line ROWs constantly increase and decrease, with the highest fields resulting when the electrical demands are the greatest, in this case typically in the winter months.

Typical homes produce background magnetic field levels (away from appliances and wiring) that range from 0.5 mG to 4 mG (USEPA 1992). Natural static magnetic fields from the earth are near 500 mG. At a distance of 55 feet from the centerline, magnetic fields produced by the proposed double-circuit transmission line would equal the magnetic field levels encountered from typical household appliances. The Colorado Public Utilities Commission states that magnetic field levels of less than 150 mG at the edge of the transmission line ROW are reasonable. The proposed double-circuit aboveground transmission lines would emit magnetic fields at the edge of the ROW at levels well below those noted by the Colorado Public Utilities Commission. Project impacts would be negligible.

For a 115-kV line double-circuit design, an electric field of less than 0.4-kV per meter would result at the point of maximum strength within the ROW. This would decrease to less than 0.07-kV per meter near the edge of the ROW. There are no Federal standards for transmission line electric fields; however, the International Committee on Non-ionizing Radiation Protection has set a voluntary protection level for electrical fields for the general public of 4.2 kV per meter (International Committee on Non-ionizing Radiation Protection [ICNRP] 1998). The proposed double-circuit aboveground transmission line would emit magnetic fields at the edge of the ROW at levels well below the level recommended by the ICNRP resulting in a negligible long-term effect.

The health effects associated with the upgraded aboveground transmission line would be similar or less than those for the existing line.

As detailed in **Tables 4.14-1** and **4.14-2**, and **Figures 4.14-1** and **4.14-2,** EMF levels associated with the wooden H-frame structures would be higher than the single-pole double circuit structures; however, these levels reduce greatly at 30 feet from the centerline. Under Alternative A, there would be one residence in the Park Hill subdivision that would be within 100 feet of the centerline. Under Alternatives B, C, and D, three residences in the Meadowdale Hills subdivision would be within 100 feet of the centerline. One additional residence, in the Newell Lake View subdivision, would be within 100 feet of the centerline under Alternatives C and D. At a distance of 30 feet from the transmission line centerline EMF levels would be approximately 40 to 60 percent lower than current EMF levels and would diminish rapidly beyond 30 feet. This would reduce EMF levels and lead to a negligible long-term effect. A positive long-term effect would result from the removal of the existing H-frame structures from the North Line ROW.

Electric fields for locations where the power line would be buried (Variants A2 and C1) would be blocked by soil and would not be a concern. Magnetic field levels would be near 0.21 mG near the centerline at the surface and 0.05 mG approximately 50 feet from the centerline near the edge of the ROW. These levels are well below the guidelines set by the Colorado Public Utilities Commission resulting in a negligible effect.

Long-term effects would be associated mostly with aboveground power lines, and could potentially include radio and television interference, shocks, induced current and voltage, cardiac pacemaker effects, and EMF. Low levels of EMF relative to naturally occurring levels and ICNRP levels, implementation of SCPs, and lack of sensitive receptors within the ROW contribute to a negligible long-term effect. A positive long-term effect would result from the removal of the existing H-frame structures from the South Line ROW.

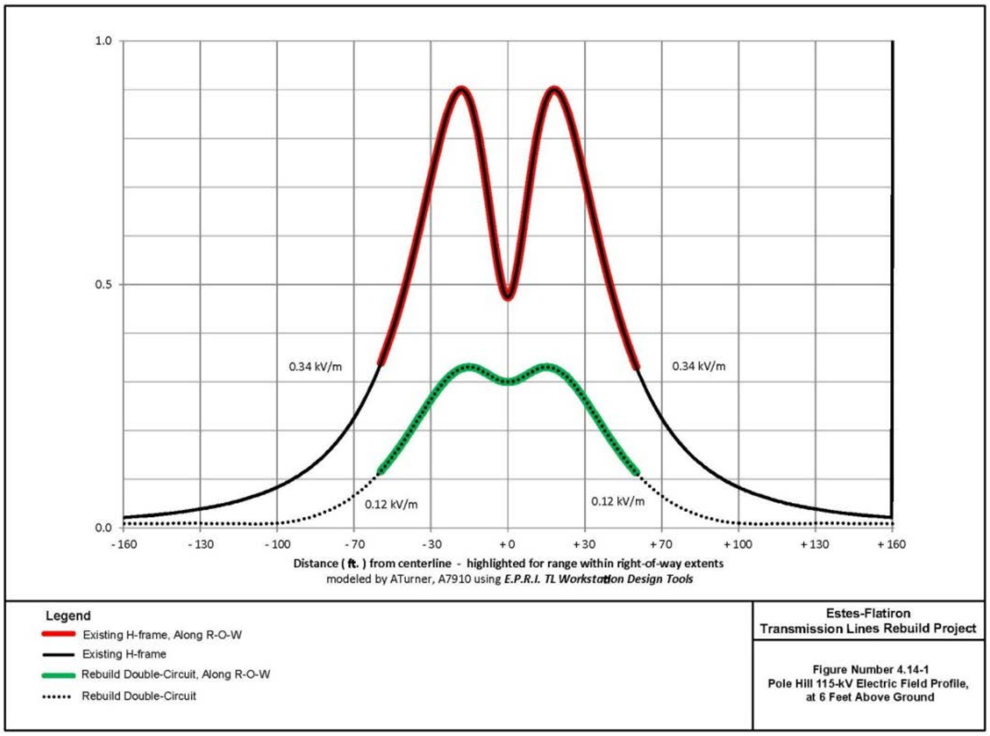

Figure 4.14-1 Pole Hill 115-kV Electric Field Profile at 6 feet Aboveground

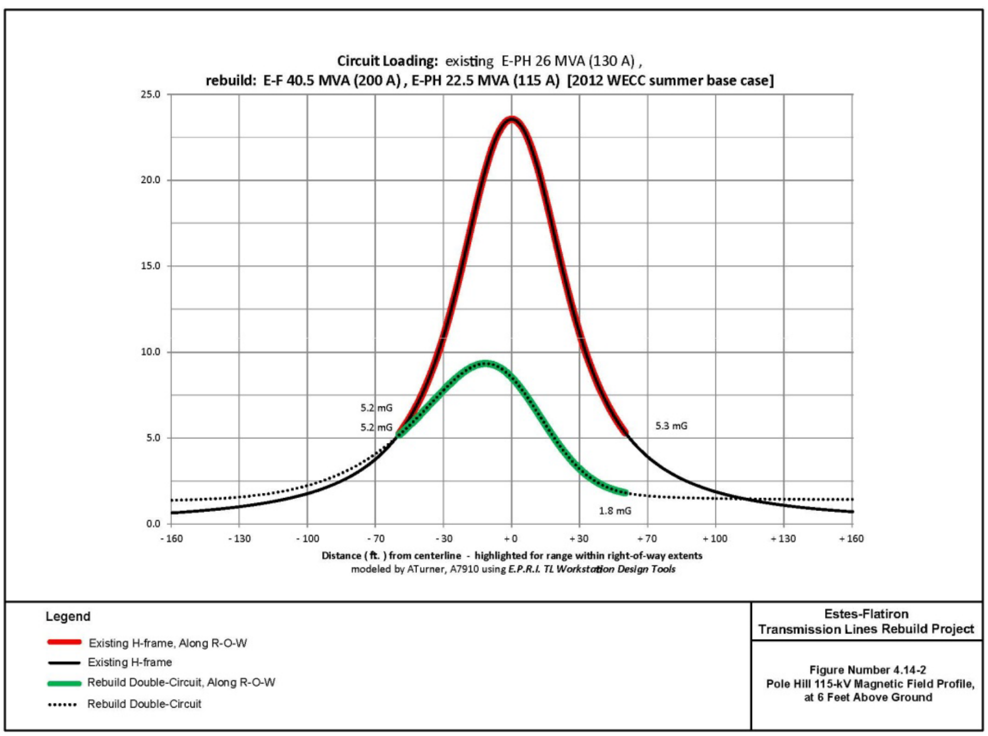

Figure 4.14-2 Pole Hill 115-kV Magnetic Field Profile at 6 feet Aboveground

4.14.6 Mitigation

After implementing SCPs 20 and 39, there would be no significant impacts to human health in terms of electrical effects. Because electrical effects or impacts to human health would not be significant for any alternative or variant, no additional mitigation measures to avoid, minimize, or mitigate impacts would be required.

4.14.7 Residual Impacts

Direct effects associated with construction activities, such as construction equipment noise, are expected to be adverse, but short-term and minor in intensity, ending when construction activities cease. Direct long-term effects would be adverse, but negligible, as a result of the lack of sensitive receptors within the ROW and EMF levels below Colorado Public Utilities Commission guidance. The EMFs 55 feet from the proposed centerline would be lowest for the underground Variants A2 and C1. As noted in **Tables 4.14-1** and **4.14-2**, the EMFs for the aboveground alternatives at 55 feet from centerline would be lower for Alternatives, A, A1, B, and C (single-pole double circuit structures) than Alternative D and the No Action Alternative (H-frame single circuit structures). There would be no significant impacts to human health from any of the alternatives.

4.14.8 Irreversible and Irretrievable Commitment of Resources

Because the potential to cause electrical effects or impact human health resources is low or nil, no irreversible and irretrievable commitment of resources is anticipated.

4.14.9 Relationship between Short-term Uses and Long-term Productivity

Short-term impacts associated with construction of the alternatives would not adversely cause long-term electrical effects or impact the long-term human health in the area.

4.15 Cultural Resources and Native American Traditional Values

The analysis area for cultural resources is referred to as the APE for consistency with terminology used in the NHPA. Under Section 106 of the NHPA, the APE is defined as “those areas in which impacts are planned or are likely to occur. Specifically, the APE is defined as the geographic area or areas within which an undertaking may directly or indirectly cause changes in the character or use of historic properties, if any such properties exist. Additionally, the APE is influenced by the scale and nature of an undertaking and may be different for different kinds of effects caused by the undertaking (36 CFR 800.16[d]).”

For purposes of this EIS, the analysis area for cultural resources and Native American traditional values is a 110-foot-wide ROW centered on the transmission line alternatives, and a 100-foot-wide area centered on all newly proposed access roads and any existing access road requiring upgrades, and the footprint of all proposed substations including a 200-foot buffer. For all other proposed locations or temporary construction sites, the APE includes the footprint plus a 200-foot buffer. The APE for visual effects includes a 2-mile-wide area centered on the transmission line alternatives. Some sites or features immediately adjacent to the APE also may be included at the discretion of the cultural resources specialists.

As noted in Section 1.6.4.1, an issue selected for detailed analysis is the effects of the proposed action on cultural resources, including ground disturbance for access roads, pole removal, and new structure installation. No other major issues of concern were identified by Western through internal scoping, consultation with coordinating agencies, or through comments provided during public scoping. To date, no traditional cultural properties (TCPs) or other areas of tribal importance have been identified either by the tribes participating in the government-to-government consultation process or as a result of the Class III inventories. With the exception of portions of the underground variants and areas where rights-of-entry were not granted, the alternative ROWs have been inventoried for cultural resources. In the event a portion of an alternative that has not been previously inventoried is selected, additional inventories would be completed prior to Project construction. Development of the Project could affect NRHP-eligible cultural resources (i.e., historic properties), if they are present in the APE.

The following impacts were considered as a result of constructing and operating the Project:

- Potential impacts resulting from surface-disturbing activities, such as access to construction areas by large machinery, improvement of existing access roads, use of staging areas for storage of equipment and supplies, and future maintenance activities. These physical impacts could occur to both known sites and subsurface sites that could be discovered and disturbed during ground-disturbing activities.
- Potential construction impacts that include changes in erosion patterns.
- Potential impacts to historic properties related to four-wheel drive/OHV or other traffic associated with construction or maintenance.
- Potential impacts to historic properties from increased access to areas or increased numbers of people during construction resulting in vandalism and illegal artifact collection.
- Potential impacts resulting from introducing visual or auditory elements associated with new structures and auditory emissions in an otherwise rural or natural setting that is out of character with a resource.

Potential effects to TCPs or other areas of tribal importance to Native Americans will continue to be addressed should any such properties should be identified. The NHPA, American Indian Religious Freedom Act of 1978, and other regulations provide for Federal protection of these types of sites and consideration of religious practices that might be impacted as a result of the Project. If any TCPs be located in the Project area, potential adverse effects could include:

- Impacts related to physical damage to cultural, traditional, religious, or sacred sites.
- Visual impacts resulting from Project development. (Further discussion and assessments for Visual Resources are presented previously in Section 4.12.)
- Noise impacts resulting from Project construction and operation.
- Loss of access.
- Infringement on the practice of religion by traditional practitioners.

4.15.1 Methodology

Surface disturbance impacts were evaluated for each alternative using the following method:

- Review of potential impacts to historic properties is based on review of the existing literature and site information collected during the Class III pedestrian inventories conducted (Section 3.15.1), including a comparison of the number of historic properties for each alternative.
- Review of existing literature and site information collected during the Class III inventories, as well as the government-to-government consultation efforts for potential impacts to Native American traditional values.

With the exception of portions of the underground variants and areas where rights-of-entry were not granted, all of the existing transmission lines, proposed reroutes, and existing access roads have been inventoried to Class III standards. Class III inventories would be conducted for any new access roads identified during the design phase. All built environments that are 45 years or older would be recorded at a level adequate to determine Project effects. Any information on the location of cultural resources would be treated in accordance with Section 304 of the NHPA and Section 9 of the Archaeological Resources Protection Act of 1979.

4.15.2 Significance Criteria

A significant impact on cultural resources and Native American traditional values would result if any of the following were to occur from construction or operation of the Project:

- Damage to, or loss of, a site of archaeological, tribal, or historical value that is listed, or eligible for listing, on the NRHP.
- Loss or degradation of a TCP or sacred site, or if the TCP or site is made inaccessible for future use.

Impacts are considered significant if actions result in effects to properties listed or determined eligible for inclusion in the NRHP or considered important to Native American groups as measured by:

- Physical destruction or alteration of a property or relocation from its historic location;
- Isolation or restriction of access;
- Change in the character of the property's use or of physical features within the property's setting, or the introduction of visible, audible, or atmospheric elements that are out of character with the significant historic features of the property;
- Neglect that leads to deterioration or vandalism; and
- Transfer, sale, or lease from Federal to non-Federal control, without adequate and legally enforceable restrictions or conditions to ensure the preservation of the historic significance of the property.

Significance, under NEPA, is detailed in 40 CFR 1508.27 and is distinct from archaeological significance. Archaeological significance is measured by four categories defined by 36 CFR 60.4:

"The quality of significance in American history, architecture, archaeology, and culture 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:

A. Are associated with events that have made a significant contribution to the broad patterns of our history;

B. Are associated with the lives of persons significant in our past;

C. Embody the distinctive 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

D. Have yielded, or may be likely to yield information important in prehistory or history" (36 CFR 60.4).

4.15.3 Impacts Common to All Alternatives

Development of the Project could directly or indirectly affect historic properties or sites of importance to Native Americans. **Table 4.15-1** lists all cultural resources, including historic properties, documented along each Project alternative. Ground-disturbing activities associated with installation of the transmission line structures, including foundations, improvement of existing access roads, establishment of new spur roads, demolition activities, use of temporary work areas and staging areas for storing equipment and supplies, and future maintenance activities would have the potential to directly impact historic properties or sites of importance to Native Americans. These physical impacts could occur to both known sites and subsurface sites and could result in the vertical and horizontal displacement of soil containing cultural materials, damage to or destruction of artifacts and features, and loss of archaeological data.

Table 4.15-1 Sites Documented during the Class III Inventories

Site Number	Site Type	NRHP-Eligibility Determination by Western	No Action	Action Alternative where Feature is Located						
				A	A1	A2	B	C	C1	D
5LR827	Pinewood School (along Alternatives C & D reroute)	Recommended not eligible						X	X	X
5LR801	Rowe Cabin (along access road)	Determined not eligible	X	X	X	X				X
5LR2148	Log cabin	Determined not eligible	X				X	X	X	X
5LR3992\ 5LR9390	Pole Hill Power Plant and Switchyard	Within existing CBT Project Historic District; contributing element – determined as eligible	X	X	X	X	X	X	X	X
5LR3994	Pole Hill Afterbay Dam	Within existing CBT Project Historic District; contributing element – determined as eligible	X	X	X	X	X	X	X	X
5LR3995	Little Hell Creek Diversion Dam	Within existing CBT Project Historic District; contributing element – determined as eligible	X							X
5LR4003	Pole Hill Canal	Within existing CBT Project Historic District; contributing element – determined as eligible	X	X	X	X	X	X		X
5LR9388	F-PH Transmission Line	Determined not eligible	X				X	X	X	X
5LR12920	Ranch complex	Determined eligible	X	X	X	X		X	X	X
5LR12921	Mine adit	Determined not eligible	X				X	X	X	X
5LR12922	Log cabin and associated features	Determined eligible	X	X	X	X				X
5LR12923	Can scatter	Determined not eligible	X				X	X	X	X
5LR12924	Isolated find	Determined not eligible	X	X	X	X		X	X	X
5LR12925	Isolated find	Determined not eligible	X				X			X
5LR12926	Isolated find (along access road)	Determined not eligible; SHPO did not agree with eligibility determination – recommends additional work	X	X	X	X				X
5LR12927	Isolated find	Determined not eligible						X	X	
5LR12928	Isolated find	Determined not eligible	X				X	X	X	X
5LR13201	John Grieg Homestead	Recommended as eligible							X	
5LR13202	Isolated find	Recommended as not eligible			X					

Source: Satterwhite 2012.

Potential indirect effects associated with the Project could include changes in erosion patterns due to construction activities, soil compaction, or vegetation removal; off-road construction and maintenance vehicle traffic; or, vandalism, inadvertent damage, or illegal artifact collection as a result of increased numbers of people in the APE during Project construction and maintenance. Other potential indirect effects could include visual impacts to historic properties, TCPs, or other sites of tribal importance where setting is an aspect of the site's integrity.

In consultation with the Colorado SHPO and interested tribes, Western is determining whether construction of the Project would affect any historic properties, TCPs, or other sites considered important to Native American groups. If these types of sites would be adversely affected, mitigation would be proposed to minimize or mitigate those effects. Mitigation may include, but not be limited to, one or more of the following measures: 1) avoidance through siting of the transmission structures and access roads or the use of realignment of the transmission line, relocation of staging areas, or changes in the construction and/or operational design; 2) data recovery, which may include the systematic professional excavation of an archaeological site or the preparation of photographic and/or measured drawings documenting standing structures; or 3) the use of landscaping or other techniques that would minimize or eliminate effects on the historic setting or ambience of standing structures. Western anticipates that by following the procedures outlined in Section 106 of the NHPA, adverse impacts to historic properties, TCPs, or other sites of tribal importance would be avoided or mitigated. On this basis, Project impacts would be none to minor.

Western's SCPs would help prevent other impacts to historic properties, TCPs, or other sites of tribal importance during construction and maintenance activities. To minimize vandalism and unauthorized collecting of archaeological material during construction, all construction personnel would be educated on the significance of cultural resources and the relevant Federal regulations intended to protect them (SCP 4). Access to the construction area would be limited to the ROW, existing roads, and any newly designated routes to reduce the potential effects to historic properties and sites of tribal importance as a result of off-road driving by Project personnel (SCP 1). To reduce impacts related to changes in erosion patterns caused by construction, ground surface restoration and reclamation techniques would be carried out to minimize erosion and facilitate natural revegetation (SCP 3, SCP 6, and SCP 26). If previously unknown cultural resources are discovered during construction, all ground-disturbing activities at the location of the discovery would be suspended until the provisions of the NHPA have been carried out (SCP 46).

In those instances where site avoidance is the agreed mitigation, construction activities would be monitored or sites flagged to prevent inadvertent destruction of historic properties or sites of tribal importance (SCP 44). Additionally, construction crews would be monitored to the extent possible to prevent vandalism or unauthorized removal or disturbance of cultural artifacts or materials (SCP 45). Where site avoidance is the agreed mitigation, there would be no effect from any Project alternative.

If at any time during this Project, possible human remains are discovered, Western's archaeologist and the USFS Arapaho-Roosevelt National Forest (USFS) archaeologist would be notified immediately (no later than 24 hours after the discovery) by telephone and email. Work of all types would halt immediately within 300 feet of the remains and reasonable protective measures would be employed until such time as appropriate agency personnel, the Colorado State Archaeologist, the Larimer County Sheriff, and/or the Larimer County Coroner can be notified and are able to determine the nature and significance of the remains. Work would not be allowed to continue in the vicinity until the remains can be thoroughly examined, documented, or recovered if necessary which may take 30 days or more.

If the discovery is located on Federal land, it may be necessary to implement the provisions of 43 CFR Part 10 for the protection or repatriation of Native American human remains, sacred objects, funerary objects or objects of cultural patrimony. These provisions require additional consultation between Western, the USFS, the Colorado SHPO, the Advisory Council on Historic Preservation and relevant federally recognized American Indian tribes.

To reduce the potential for visual effects, the contractor would exercise care to preserve the natural landscape, and would conduct its construction operations to prevent any unnecessary destruction, scarring, or defacing of the natural surroundings in the vicinity of the work (SCP 5). In addition, construction staging areas would be located and arranged in a manner to preserve trees and vegetation to the maximum practicable extent (SCP 7). Further discussion and assessments for Visual Resources are presented previously in Section 4.12.

Increased maintenance activities, expansion of the ROW, and acquisition of new ROW could result in direct and indirect effects to historic properties or sites of tribal importance located within or adjacent to the transmission line ROW and access roads. SCPs would be employed to minimize potential adverse effects during maintenance activities; therefore, Western anticipates that no adverse direct or indirect effects to historic properties or sites considered important to Native American groups would occur.

Short-term impacts include direct disturbance to historic properties or sites of tribal importance as a result of Project-related construction activities or illegal collecting and vandalism related to increased numbers of people in the APE during construction activities. These types of impacts would be avoided or mitigated through implementation of Western's SCPs. Therefore, no short-term impacts would be anticipated as a result of Project alternatives.

Long-term impacts could include indirect disturbance due to changes in erosion patterns as a result of expanding the ROW or acquiring new ROW. Vandalism or illegal collecting of artifacts as a result of increased numbers of people in the APE during maintenance activities most likely would continue to occur at current levels. Erosion impacts would be minimized through implementing Western's SCPs, and impacts would be negligible or minor.

4.15.4 No Action Alternative

Class III inventories have been conducted along the No Action Alternative and associated access roads. As a result of the inventories, 13 historic sites and four historic isolated finds were documented along the No Action Alternative and associated access roads (**Table 4.15-1**). Site density, particularly of prehistoric sites, is very low.

Direct and indirect impacts for areas of new construction would be the same as those described in Section 4.15.3. Short-term and long-term effects would be the same as those described in Section 4.15.3.

4.15.5 Impacts Unique to Specific Action Alternatives

A summary of historic sites documented along Project alternatives is included in **Table 4.15-1**.

A total of six historic sites and two historic isolated finds were documented along Alternative A and associated access roads during the Class III inventories.

A total of six historic sites and three historic isolated finds were documented along Alternative A with Variant A1 and associated access roads during the Class III inventories.

A total of six historic sites and two historic isolated finds were documented along Alternative A with Variant A2 and associated access roads during the Class III inventories.

As a result of the Class III inventories, eight historic sites and two historic isolated finds were documented along Alternative B.

A total of nine historic sites and four isolated finds were documented along Alternative C and associated access roads during the Class III inventories.

A total of nine historic sites and four historic isolated finds were documented along Alternative C with Variant C1 and associated access roads during the Class III inventories.

As a result of the inventories, 12 historic sites and 4 historic isolated finds were documented along Alternative D and associated access roads.

Direct and indirect impacts for Alternatives A, B, C, and D would be the same as those described in Section 4.15.3. Short-term and long-term effects for these alternatives would be the same as those described in Section 4.15.3.

Impacts to historic properties or sites considered important to Native American groups located in the APE would be avoided or mitigated through implementation of a historic properties treatment plan and Western's SCPs. Impacts to previously unknown historic properties or sites of tribal importance that may be discovered during maintenance activities would be mitigated under Western's SCPs.

4.15.6 Mitigation

Impacts to historic properties or sites of tribal importance located in the APE would be avoided or mitigated through implementation of a historic properties treatment plan and Western's SCPs. Impacts to previously unknown historic properties or sites of tribal importance that may be discovered during construction activities would be mitigated under Western's SCPs. Therefore, no additional mitigation is recommended.

4.15.7 Residual Impacts

Impacts to previously unknown historic properties or sites of tribal importance that may be discovered during construction or maintenance activities would be mitigated under Western's SCPs and EPMs. Per Section 4.15.5 above, and considering Alternative D would involve construction along both existing transmission lines, Alternative D has the greatest number of historic properties encountered per literature review and pedestrian surveys. Residual impacts to historic properties or sites considered important to Native American groups are anticipated to be negligible or minor. There would be no significant impacts to cultural resources or Native American traditional values from any of the alternatives.

4.15.8 Irreversible and Irretrievable Commitment of Resources

Historic properties could be irreversibly and irretrievably lost if inventory, avoidance, and/or mitigation efforts are not sufficient to identify and protect these properties. However, all potential ground disturbing site activities would have Class I and Class III inventories of them prior to construction. Western would locate structures and access roads to avoid or minimize effects on known eligible cultural sites.

4.15.9 Relationship between Short-term Uses and Long-term Productivity

The Project would result in the loss of short-term use and long-term productivity of cultural resources not eligible for the NRHP and located in proposed disturbance areas. Currently, there are no known historic properties that cannot be avoided by the Project. However, if an historic property is located in proposed disturbance areas and cannot be avoided, data recovery or other types of mitigation would be conducted prior to Project construction in accordance with NHPA regulations and Western's SCPs. The scientific information obtained through mitigation would be preserved for the long-term. However, the property itself ultimately would be lost. There could be a long-term loss of cultural resources due to illegal collecting of artifacts and vandalism associated with Project construction and operation.

4.16 Transportation

The analysis area for transportation resources includes roads that transect the alternatives as well as the local road network that would be utilized to directly access the proposed alternatives. Issues associated with transportation are congestion resulting from increased traffic, travel impediments and adequate emergency access. Key Issues as defined in Section 1.6.4.1, Key Issues, include effects of new road construction in inaccessible areas with difficult constructability in solid rock outcrops. Other issues selected for detailed analysis related to transportation as presented in Section 1.6.4.2, include effects of road construction, road reconstruction, road reconditioning and ongoing maintenance on wetlands, soils, and water quality.

4.16.1 Methodology

Impacts to transportation were assessed by comparing projected additional travel demand due to Project activities to existing daily traffic counts. Existing daily traffic counts presented in Section 3.16 were obtained from the Colorado Department of Transportation and Larimer County. Construction labor and operational staff projections for the proposed transmission line rebuilds were used as a basis for identifying impacts that may occur during construction and operations. Construction of transmission lines could be carried out using multiple work crews over wide-ranging time periods.

In addition, a quantitative comparison between alternatives is presented that distinguishes issues such as: the number of miles that require construction within areas that are presently not accessible with difficult constructability in rock outcrops; the length and disturbance areas for temporary and permanent access roads; and length of USFS road to be reconstructed or reconditioned.

4.16.2 Significance Criteria

A significant impact on transportation resources would result if any of the following were to occur from constructing or operating the Project:

- A decrease of long-term roadway or intersection effectiveness below present service level.
- Creation of permanent impediments to traffic.
- Creation of road conditions that would require frequent and recurring roadway repair or maintenance.

4.16.3 Impacts Common to All Alternatives

The primary transportation impacts that would occur would apply to all alternatives. Western would utilize access roads already in service for the existing transmission lines; however, where existing access roads are not available on USFS lands, Western would acquire additional easement and follow USFS road construction requirements and Western's SCPs to gain access. Direct and indirect adverse impacts to USFS and non-USFS transportation resources could come from growth in traffic due to increased vehicle trips during construction. It is anticipated, given the maintenance of only one transmission corridor, that traffic maintenance levels would decrease during operations from existing maintenance levels. Increases in Project traffic would occur along the local road network including existing access roads. These increases would not exceed the service level of any roadway. Roads subject to interference by construction or maintenance work would be kept open without unreasonable delays or suitable detours would be provided and maintained. Protection of the public would be provided as required by OSHA 1926, Subpart G (Signs, Signals, and Barricades) and by the public agency having law enforcement jurisdiction for the roadway. Additionally, all road signs would conform to Manual on Uniform Traffic Control Devices (MUTCD) standards. Direct and indirect impacts to transportation resulting from constructing and operating the proposed transmission lines rebuild would be negligible to moderate, and impacts would be temporary.

During construction activities, short-term adverse impacts would occur from increased vehicle trips associated with equipment and material delivery and worker transportation. An increase in vehicle trips would result in additional truck volume along the local road network. The resulting increase in traffic volume is projected to fall within the capacity of roads within the Project area. Construction vehicles and equipment would be staged at either staging areas (i.e., vehicles such as concrete trucks, semi-trailers), at structure locations (i.e., cranes, bulldozers, augers), or on USFS administrative roads constructed to new structure sites. Construction traffic on USFS ML2 roads would be intermittent and short-term, and would not close existing ML2 roads. In the absence of construction pull-outs, high clearance vehicles would likely need to find a place to pull off a road if they meet construction traffic traveling in the opposite direction. The adverse impacts from the projected increase in traffic volume would be short-term, decreasing when construction activities are completed. Long-term adverse impacts would be associated with traffic generated by periodic maintenance trips utilizing the local road network and maintenance roads. USFS ML2 roads would need to be temporarily closed for short periods of time during clearing, augering, and structure installation activities where these activities occur in proximity to the road. The periodic maintenance would include road maintenance to sustain road conditions. These visits would be intermittent and would result in a negligible impact.

4.16.4 No Action Alternative

Under the No Action Alternative, the existing transmission lines would remain in service through continuing structure replacement and maintenance. Maintenance requirements on the existing lines would increase with as much as 70 to 80 percent of all structures in need of replacement as a result of age and subsequent deterioration. At one location, specifically a segment through the Newell Lake View subdivision, the existing line would have to be relocated on a new ROW due to several residences being adjacent to the existing inadequate ROW.

Direct and indirect adverse impacts associated with the No Action Alternative and the relocation of the transmission line at the Newell Lake View subdivision would be similar to those described in Impacts Common to All Alternatives. Direct and indirect adverse impacts to transportation resulting from the No Action Alternative would be minor as a result of the low level of Project generated traffic having a slight but detectable effect on local roadway traffic levels.

Short-term and long-term impacts associated with the No Action Alternative would be similar to those described in Impacts Common to All Alternatives.

4.16.5 Impacts Unique to Specific Action Alternatives

It is estimated that constructing the transmission lines would require 10 to 15 construction workers devoted to transmission line construction. Given the small number of workers and construction vehicles it is anticipated that direct and indirect traffic disruptions on existing roads would be minimal and localized, resulting in no significant impacts.

New access roads would be required to access new structures sites that are not accessible from existing access roads. Areas where new access would be acquired would experience increased levels of truck traffic during construction. Direct and indirect impacts to transportation resulting from the action alternatives would be minor due to the low level of Project-generated traffic.

Incremental lower levels of truck traffic would result from Alternative D due to less concrete truck trips associated with differing construction techniques on wood H-frame poles vs. the single pole structures, although auguring and other construction activities would still require an increased number of trips relative to baseline conditions. This decrease in truck trips relative to the other action alternatives would be negligible. An elevated level of traffic would result from Variants A2 and C1 as an increased level of concrete would be needed during construction for the cable trenches. Even with an increased level of traffic associated with these variants, the overall increase in traffic levels are expected to result in minor adverse impacts. Long-term beneficial impacts would be anticipated under Alternatives A, Variants A1 and A2, B, C, and Variant C1 as decommissioning of an entire ROW would result in a noticeable decrease in maintenance associated traffic levels.

Temporary short-term disturbances would result from construction traffic along the ROW and local road network as noted in **Table 4.16-1**, but would subside when construction is completed. Long-term disturbance for permanent new access roads by alternative is provided in **Table 4.16-1**. Alternative D would have the greatest long-term disturbance due to the need to provide access to two transmission lines.

Table 4.16-1 Summary of Short-term and Long-term Surface Disturbance for Access Routes

Disturbance Type	A	A1	A2	B	C	C1	D
Short-term disturbance for temporary access (acres)	7	7	7	7	8	8	0
Long-term disturbance for permanent access (acres)	10	10	11	13	10	9	21

* Assumes 8-foot-wide access route for temporary access and 15-foot-wide access route for permanent access. Permanent access would be 12 feet wide on roads on National Forest System land.

Site-specific access requirements off National Forest System land cannot be determined until final design and engineering. However, on National Forest System land an assumption of pole-for-pole replacement was made. Based on this assumption, access requirements for each of the alternatives were determined. Actual access requirements are expected to be less.

The miles of system roads, permanent access, and temporary access needed for removal of existing line and new construction under each of the action alternatives is summarized in **Table 4.16-2**. Alternative D would require the most permanent access (2.5 miles), followed by Alternatives A, A1, and A2 (1.3 miles) and Alternatives B, C, and C1 (0.8 mile). Areas with difficult constructability due to rock outcrops include The Notch and an area west of Pole Hill Substation along the penstocks on National Forest System land. Alternative D would require more construction of permanent access in inaccessible areas with difficult constructability (1.0 mile) than Alternative A, A1, and A2 (0.6 miles) or Alternatives B, C, and C1 (0 miles). Construction of permanent access in areas with steep topography and solid rock outcrops would require extensive excavation and blasting. Under Alternatives A, Variants A1 and A2, B, C, and Variant C1, after the ROW is decommissioned, Western's existing or temporary access to that ROW on National Forest System land also would be decommissioned. Access decommissioning may consist of providing for proper drainage, access gates, road blockage, and allowing the access route to naturally revegetate, or involve more active restoration methods such as scarification and reseeding, depending on local site conditions. Access decommissioning would be a long-term effect viewed as beneficial by some user classes and adverse by others.

USFS Road 247.D was an access road located on National Forest System lands used to access structures along the South Line (Alternatives B, C, and C1); however, flooding has rendered the road inoperable and it has been decommissioned. Western has identified a new potential access road as a replacement. Because it transects both National Forest System lands and private ownership, it is pending both USFS and private landowner approval.

Changes in classification are not anticipated for any USFS road. However, under Alternatives C and C1, Western proposes to reconstruct sections of USFS Road 122, to allow for passage of semi- trailer trucks to structure locations, resulting in increased access and user comfort, and increased use by recreationists. Under this alternative, grinding, chipping, or blasting could be used to level the grade on the west end of Pole Hill Road. Imported aggregate would be limited and used only when needed to achieve proper road grades for haul. Alternatives A, A1, A2, B, and D propose either no improvements to USFS roads or limited reconditioning to remove ruts post-construction.

Under Alternative C and Variant C1, the four-wheel drive section of West Pole Hill Road would be reconstructed to allow for passage of heavy construction vehicles. This section would not be returned to its previous condition. Although reconstruction would not result in a change maintenance level classification, the long-term effect of this would be the likelihood of increased recreational traffic on the transportation system due to increased accessibility and user comfort. Long-term adverse impacts associated with increased user access would be higher maintenance costs for this portion of Pole Hill Road, in addition to increased resource disturbance. Long-term beneficial impacts would include the opening of access to a larger group of recreational users. Further effects of the recreational impact from the long-term upgrade of Pole Hill Road are described in Section 4.11.

Table 4.16-2 Access Requirements on National Forest System Land by Alternative

Road Category	Alternative			
	A, A1, & A2	**B**	**C & C1**	**D**
System Roads				
Unimproved USFS System Road (miles)	1.4	0.4	0.0	0.4
Limited reconditioning of existing Maintenance Level 2 system road post-construction (miles)	2.2	3.2	0.2	3.2
Existing Maintenance Level 2 system road reconstructed to high Maintenance Level 2 for construction (miles)	0	0	3.4	0
Permanent Access (Administrative Designation)				
Existing Western access designated for administrative use (miles)	0.4	0.2	0.2	0.6
New administrative road for permanent access (miles)	0.9	0.6	0.6	1.9
Temporary Access				
New temporary road for line decommissioning (miles)	0.4	0.9	0.9	0
Temporary access by non-system two-track (miles)	0.6	0.5	0.5	0
Temporary access by overland travel (miles)	0.3	0.3	0.3	0
Roads Proposed for Decommissioning				
Existing Western access to be decommissioned (miles)	0.2	0.3	0.3	0

4.16.6 Mitigation

No mitigation measures have been proposed.

4.16.7 Residual Impacts

Residual impacts would be limited to the likelihood of increased recreational traffic on Pole Hill Road under Alternative C and Variant C1 after construction, as a result of improvements to a portion of the existing four-wheel drive segment. This effect would likely be viewed as beneficial and long-term by some individuals and organizations, but adverse and long-term by others. Similarly, impact intensity would vary depending on viewpoints. Related indirect effects on recreation activities are described in Section 4.11.5. Direct impacts associated with construction activities, such as traffic delays, are expected to be adverse but short-term and minor in intensity, and would end when construction activities cease. Thus, they would not be residual impacts. Residual traffic-delay effects from periodic maintenance trips would be adverse, but relatively infrequent and short term. Alternative D would create greater residual impacts from traffic delays, since maintaining it would require more permanent access in areas with difficult constructability (1.0 mile) than Alternative A, A1, and A2 (0.6 mile) or Alternatives B, C, and C1 (0 mile).

The increased recreational traffic on Pole Hill Road under Alternative C and Variant C1 would potentially create road conditions that would require frequent and recurring roadway repair and maintenance, resulting in significant impacts to transportation from Alternative C and Variant C1.

4.16.8 Irreversible and Irretrievable Commitment of Resources

Improvements to the four-wheel drive segment of Pole Hill Road would result in irreversible or irretrievable impacts associated with Alternatives C and Variant C1.

4.16.9 Relationship Between Local Short-term Uses and Long-term Productivity

The action alternatives may reduce short-term uses of local access roads during construction activities. Over the long term, Alternative C and Variant C1 would provide increased user access, although the Project would not result in any long-term loss or enhancement of productivity.

4.17 Accidents and Intentional Acts of Destruction

Transmission line projects may be the subject of intentional destructive acts ranging from random vandalism and theft to sabotage and acts of terrorism intended to disable the facility. Acts of vandalism and theft are more likely to occur than acts of sabotage and terrorism especially in remote areas. Vandalism often includes shooting of insulators. Sabotage and terrorism would most likely include destruction of key transmission line components with the intent of interrupting the electrical grid. Facilities also could become disabled from accidents, such as tree limbs falling on transmission lines as the result of storms or unauthorized trimming activities.

Estes Park is currently served by three high voltage lines. Under Alternatives A, B, and C where two single-circuit lines are combined into one double-circuit line, an intentional destructive act or an accident to the transmission line would be more likely to have a widespread effect on the local population. A widespread effect on the local population would be slightly less likely to occur under Alternative D. Under Alternative D, which would maintain two single-circuit lines, both transmission lines would have to undergo an intentional destructive act or succumb to multiple accidents simultaneously to result in a widespread effect. However, the new steel poles would be stronger than the H-frame poles they would be replacing and more resistant to intentional destructive acts, sabotage, and catastrophic events such as ice storms, wind, and fires, including intentionally set fires. Their greater height also may be a deterrent to intentional destructive acts and sabotage. Variants A2 and C1 would be built underground on the far western end of each variant. The increased difficulty of accessibility associated with Variants A2 and C1 would result in a lessened chance impact from an intentional act of destruction.

Intentional destructive acts and accidents can result in financial and environmental impacts as well as impacts to consumers and businesses that rely on power. Financial impacts are ultimately passed on to rate payers. Environmental impacts related to accidents and intentional destructive acts could include damage from electrocution of perpetrators, line crews, or the public; wildfire ignition from downed lines; and oil contamination from damaged equipment. Adverse impacts to consumers and businesses may range from minor annoyance to moderate economic hardship and moderate health impacts due to the low probability of the occurrences (see Section 4.14 for discussion of potential health effects from electrical systems). System monitoring and subsequent quick responsiveness by Western maintenance crews in the case of a disruption of power would assist in reducing the severity and duration of power outages.

Little or no preventive measures are available to protect the transmission line from vandalism or sabotage. However, the threat from a single act of sabotage resulting in widespread power outage would be reduced as multiple transmission lines serve the Project area. Furthermore, this part of the power system is not a key facility serving a large number of people, so it is not a likely target for terrorist activities. As noted previously, system monitoring and subsequent quick responsiveness by Western maintenance crews in the case of a disruption of power would assist in reducing the severity and duration of power outages.

4.18 Agency Preferred Alternative

The APA is comprised of a combination of alternative segments analyzed in detail in the Draft EIS. Because the alternative segments that comprise the APA were analyzed in detail in the Draft EIS, the Chapter 4.0 Final EIS analysis was not modified to show the APA as a stand-alone alternative. See Sections 2.2 and 2.8, and **Tables 2.9-1** through **2.9-4** for further description of the APA and for both quantitative and qualitative comparative impact analysis of all the alternatives including the APA. Based on public input, summary impact tables were produced (**Tables 2.9-2** and **2.9-3**) to compare the impacts at both ends of the Project (west region and east region, see **Figure 2.2-8**). Data presented in **Table 2.9-1** has been updated slightly compared to what was presented in the Draft EIS to take advantage of new data availability, revised ROW acquisition needs, and to include the APA.

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5.0 Cumulative Impacts

5.1 Introduction

This chapter describes the anticipated increment of cumulative impacts in the region for each resource that could experience direct or indirect Project impacts. The analysis of the potentially affected resources is based on the professional judgment and experience of Western, USFS, and EIS contractor resource specialists; discussions with other agency resource experts and professionals; literature reviews; and field trips to the study area by resource personnel.

The goal of this chapter is to disclose, to the greatest extent possible, the added incremental effects of the Project on resources affected by other activities in the cumulative impacts study areas. The cumulative impacts study areas are determined and described individually for each resource. If quantitative data are not available, qualitative estimates are provided to facilitate the comparison of alternatives by the public and decision makers.

Potential past and present actions and reasonably foreseeable future actions in the Project vicinity that may have environmental impacts on resources assessed in this EIS include:

- Big Thompson Fuel Reduction Project – USFS;
- Big Thompson to Flatiron – Line Structure Replacements;
- Canal Lining Replacement, Pole Hill Canal, Colorado-Big Thompson Project;
- Proposed Chimney Hollow Reservoir – NCWCD and Larimer County Natural Resources Department;
- Flatiron to Valley and Estes to Lyons – Line Structure Replacements;
- Hazardous Fuels Treatment Project – USFS;
- Vegetation Management Projects and yearly hazard tree maintenance – Western;
- Residential/subdivision development and home construction on private lands primarily along the main roadways along the valley bottoms and in the North Fork Little Thompson River Drainage, including associated infrastructure (roads, power lines, etc.);
- Livestock grazing in the one active grazing allotment;
- Timber harvest over the last 100 years for homesteads and ranches;
- Recreational motorized use;
- Disturbance from recreational hunting pressure; and
- Wildfire fuels reduction activities. These activities are anticipated to continue in the future. No Project plans submitted to state or federal agencies have been identified as reasonably foreseeable for the purposes of this analysis.

5.2 Air Quality

The cumulative impacts study area for air quality includes the area within 62 miles (100 kilometers) of Project boundaries. Visibility impacts to Class I areas are often analyzed at much greater distances. Past and present actions and reasonably foreseeable future actions that may have environmental consequences on air quality include:

- Canal Lining Replacement, Pole Hill Canal, Colorado-Big Thompson Project;
- Hazardous Fuels Treatment Project – USFS; and
- Chimney Hollow Reservoir – NCWCD and Larimer County Natural Resources Department.

All of these projects have had or would have the potential to generate criteria pollutants and GHG, mostly from vehicle exhaust and fugitive dust from disturbed soil. The potential air impacts would be temporary, and if the Projects were not constructed concurrently any impacts would be additive. These projects would undergo NEPA analyses, be constructed and maintained according their respective agency Best Management Practices, and/or be conducted according to other local, state, and federal regulatory approvals and provisions.

Construction and operation of the Project would cause incremental increases in some pollutants which in combination with past and present actions and reasonably foreseeable future actions, produce a cumulative impact. However, because the Project alternatives are not anticipated to cause impacts above current air quality criteria, the incremental increase in cumulative impacts to air quality would be short-term and minor or insignificant in intensity. Any of the cumulative Project-related emissions would be minute compared to the current vehicle output of 10,000 vehicles that use U.S. Highways 34 and 36 on a daily basis on either side of the Project.

5.3 Geology and Paleontology

No Project alternative is anticipated to cause significant impacts to geology, mineral resources, or paleontology. Therefore, there would be no incremental increase in cumulative impacts to geology, mineral resources, or paleontology.

5.4 Soil Resources

The cumulative impacts study area for soil resources is the same as the analysis area described in Section 4.4. The past and present actions and reasonably foreseeable future actions that may have environmental consequences on soil resources include:

- Canal Lining Replacement, Pole Hill Canal, Colorado-Big Thompson Project;
- Thompson River Fuel Reduction Project
- Hazardous Fuels Treatment Project – USFS; and
- Chimney Hollow Reservoir – NCWCD and Larimer County Natural Resources Department.

All of these projects have had or would have the potential to create surface disturbance to soil resources, thus increasing the potential for soil compaction, accelerated runoff, erosion, and sedimentation. In general, cumulative impacts to soil resources would result in short-term impacts to soil resources. An exception would be the Chimney Hollow Reservoir Project, which would result in long-term impacts to soil resources.

In general, incremental increases in cumulative impacts to soil resources in the cumulative impacts study area from the Project alternatives would be limited based on the proposed SCPs.

5.5 Water Resources and Floodplains

The cumulative impacts study area for water resources and floodplains are the four hydrologic units transected by the Project (Lake Estes/Big Thompson, Headwaters Little Thompson River, North Fork Little Thompson River, and Dry Creek) as indicated in Chapter 3.0, Section 3.5 Water Resources and Floodplains, **Figure 3.5-1**. The past and present actions and reasonably foreseeable future actions that may have environmental consequences on surface water, groundwater, or floodplains that would be similar to those of the Project alternatives include:

- Flatiron to Valley and Estes to Lyons – Line Structure Replacements;
- Canal Lining Replacement, Pole Hill Canal, Colorado-Big Thompson Project;
- Hazardous Fuels Treatment Project – USFS;
- Chimney Hollow Reservoir – NCWCD and Larimer County Natural Resources Department;
- Big Thompson to Flatiron – Line Structure Replacements; and
- Big Thompson Flooding 2013.

All of these projects or events have had or would have the potential to create accelerated runoff and sedimentation, cuts-and-fills or other disturbance at stream crossings or along channels and banks, or impacts to groundwater supplies or quality from excavation or discharge. Additional effects from the proposed Chimney Hollow Reservoir may include greater evaporation losses from the reservoir surface, dam seepage and water table effects, and impacts from water rights considerations and trans-mountain flows needed to fill the reservoir.

In general, incremental increases in cumulative impacts to water resources from the Project alternatives would be short-term, negligible to minor increases in runoff and sediment yield, resulting in a potential temporary degradation of water quality in the receiving streams. These incremental Project impacts would largely be avoided by Western's implementation of SCPs and EMPs. The cumulative impacts of this Project combined with those listed above would be primarily short-term adverse changes in water quality that would dissipate when construction ends. There would be no incremental increase in cumulative impacts to groundwater or floodplains.

5.6 Wetlands and Waters of the U.S.

The cumulative impacts study area for wetlands and waters of the U.S. is defined as the HUC 12 watersheds crossed by the Project alternatives as indicated for water resources and floodplains above. The cumulative analysis for wetlands and waters of the U.S. focuses on five past and present actions and reasonably foreseeable future actions that are likely to affect wetland and waters of the U.S. resources:

- Big Thompson to Flatiron – Line Structure Replacements;
- Canal Lining Replacement, Pole Hill Canal, Colorado-Big Thompson Project;
- Chimney Hollow Reservoir – NCWCD and Larimer County Natural Resources Department;
- Flatiron to Valley and Estes to Lyons – Line Structure Replacements; and
- Thompson River Fuel Reduction Project; Hazardous Fuels Treatment Project – USFS.

Depending on when the past projects were constructed, jurisdictional wetlands and waters of the U.S. may have been affected without consultation with the USACE. Mitigation for impacts may or may not have occurred.

As stated in Chapter 2.0, Western would avoid construction and maintenance activities in wetlands wherever possible. Although wetlands are known to occur within the ROWs, Western can avoid direct impacts to them by designing around them and spanning them. As identified in Chapter 2.0, SCPs and proposed EPMs include additional inventories and agency coordination as needed for a selected alternative. If resource avoidance was not possible, these practices and procedures would minimize and mitigate potential impacts. Because of this, incremental impacts from the Project are unlikely to occur, or to contribute to cumulative impacts on these resources.

5.7 Vegetation

The cumulative impacts study area for vegetation resources is the same as the direct effects analysis area for the Project. The cumulative analysis for vegetation resources, including noxious weeds and wildland fires focuses on five past and present actions and reasonably foreseeable future actions that are likely to affect vegetation resources, noxious weeds, and wildland fire:

- Residential/subdivision development and home construction on private lands primarily along the main roadways along the valley bottoms and in the North Fork Little Thompson River Drainage, including associated infrastructure (roads, power lines, etc.);
- Flatiron to Valley and Estes to Lyons – Line Structure Replacements and yearly hazard tree maintenance;
- Canal Lining Replacement, Pole Hill Canal, Colorado-Big Thompson Project;
- Hazardous Fuels Treatment Project – USFS; and
- Big Thompson to Flatiron – Line Structure Replacements.

Past and present actions and reasonably foreseeable future actions would cumulatively reduce available vegetation cover types in the cumulative impacts study area until such time that reclamation (or fuel reduction) is deemed successful. Successful reclamation is defined as re-establishing a sustainable vegetation community that has similar species diversity and vegetative cover compared to similar undisturbed native vegetative communities. Fuel reduction activities and their anticipated extents in various vegetation communities are discussed further in Section 5.9, Wildlife, below.

Incremental increases in cumulative impacts associated with the No Action Alternative would be related to acquisition of additional ROW, and additional maintenance activities associated with the existing line. From the Project alternatives, minor incremental increases in cumulative impacts to vegetation resources potentially would include the changes in numerous habitat functions including species biodiversity, acreage of woodlands, wildlife forage and habitat, and available forage for livestock grazing operations. However, under most action alternatives (including the APA), incremental beneficial impacts also would occur to vegetation resources as existing ROW would be abandoned and allowed to revert to natural conditions (see Section 2.2.1). Control of noxious weeds is an ongoing issue within the study region. The spread of new or existing noxious weed species to or from the Project area would be a significant cumulative impact if it occurred; however SCPs and EPMs would be implemented to minimize the spread and establishment of noxious weeds.

5.8 Special Status Plant Species

The cumulative impacts study area for special status species is the same as the analysis area for the Project. The cumulative analysis focuses on past and present actions and reasonably foreseeable future actions that are likely to affect special status species:

- Flatiron to Valley and Estes to Lyons – Line Structure Replacements;
- Canal Lining Replacement, Pole Hill Canal, Colorado-Big Thompson Project;
- Hazardous Fuels Treatment Project – USFS;
- Big Thompson to Flatiron – Line Structure Replacements; and
- Range Fuels Treatment Partnership Implementation Strategy.

Incremental increases in cumulative impacts associated with the No Action Alternative would be related to acquisition of additional ROW, and additional maintenance activities associated with the existing line. Past and present actions and reasonably foreseeable future actions would incrementally reduce available special status species habitat until such time that reclamation is deemed successful.

For all action alternatives, cumulative effects on special status species potentially would include the reduction of available special status habitat, fragmentation of forest canopy, and losses of woody habitat species. However, under most action alternatives (including the APA), incremental beneficial impacts also would occur to special status species as existing ROW would be abandoned and allowed to revert to natural conditions (see Section 2.2.1). The increment of cumulative impacts from action alternatives would be minor based on the small amount of surface disturbance associated with the Project.

5.9 Wildlife

The cumulative impacts study area for wildlife resources is the Elk Ridge Geographic Area (GA) boundary, an approximately 29,000-acre (45 square miles) area that includes approximately 21,000 acres of National Forest System lands (USFS 1997b, Figure 2.30). This area has excellent year-round habitat for wildlife. It is a mix of foothills shrub-grass communities, juniper-ponderosa pine communities on south slopes, and Douglas-fir on north slopes. Some lodgepole pine occurs at higher elevations. Remnants of old growth ponderosa pine occur in the area. Elevations vary from 6,200 to 9,284 feet. The goal of the GA is to manage vegetation to achieve a mix needed for wildlife habitat and to reduce fuel loading, especially near subdivisions.

The Elk Ridge GA contains a mixture of homes situated between wildlife areas. These wildland-urban interface zones are the focus of the Range Fuels Treatment Partnership Implementation Strategy. The partnership is comprised of federal, state, and local governments, land management agencies, private landowners, conservation organizations and other stakeholders. The purpose of the partnership is to reduce wildland fire risks through sustained fuels treatment along Colorado’s Front Range to work to enhance community sustainability and restore fire-adapted ecosystems over a 10-year period. The partnership assessed areas and activities that were of greatest concern.

Activities within these areas includes timber harvest to increase habitat potential and control fuel buildups; manage lodgepole pine to reduce fuels, create openings and maintain thermal and hiding cover; increase the amount of aspen represented in the landscape; and manage ponderosa pine to emulate conditions representative of a nonlethal understory fire regime, to emphasize old-growth recruitment and retention and to reduce fuels.

Primary past and present actions and reasonably foreseeable future actions within the cumulative impacts study area for wildlife that can have appreciable impacts on habitat include:

- Residential/subdivision development and home construction on private lands primarily along the main roadways along the valley bottoms and in the North Fork Little Thompson River Drainage, including associated infrastructure (roads, power lines, etc.);
- Past livestock grazing in the one vacant grazing allotment;
- Timber harvest over the last 100 years for homesteads and ranches;
- Recreational motorized use;
- Disturbance from recreational hunting pressure; and
- Wildfire fuels reduction and vegetation management activities within the Thompson Valley and Estes Valley Fuels Treatment Areas (FTAs).

Residential development on private lands is expected to continue, but it would likely be confined primarily to the immediate valley bottoms on or near the main roads, as currently exists, due to steep slopes and because National Forest System lands are prevalent on upper slopes and higher elevations. Private and other lands not under USFS jurisdiction comprise 8,023 acres of the Elk Ridge GA or about 28 percent of the 28,726-acre GA. However, the large majority of this acreage would not likely be developed for homes due to steep slopes or ownership patterns, and therefore would continue to provide habitat with little permanent human disturbance. This lack of development generally provides habitat conditions with limited and infrequent disturbance.

Within the Thompson Valley and Estes Valley FTAs, vegetation management activities include clear cuts, aspen enhancement, and forest thinning practices. Impacts to wildlife habitat based on the two USFS FTAs within the study area are detailed in **Table 5.9-1**. These activities are anticipated to continue in the future. No Project plans submitted to state or federal agencies have been identified as additional reasonably foreseeable for the purposes of this analysis.

Table 5.9-1 Affected Vegetation within the Thompson Valley and Estes Park Fuel Treatment Areas

Cover Type	Acres
Forested	71
Grassland	314
Barren	1
Shrub	61
Shrub - Riparian	<1
Aspen	244
Douglas-fir	816
Lodgepole Pine	1,996
Ponderosa Pine	1,833
Subalpine Fir / Engelmann Spruce	148
Surface Water	6
Grand Total	**5,491**

Cumulative impacts from any action alternative or variants would incrementally increase in the cumulative impacts study area during the Project construction, but would gradually decrease during operation of the Project alternatives as reclamation occurs. Cumulative impacts from past and present activities within the cumulative impacts study area common to all wildlife species and the incremental increases in cumulative impacts are discussed below:

- Reduction of suitable wildlife habitat and increased habitat fragmentation: While surface disturbance generally corresponds to associated wildlife habitat loss, accurate calculations of cumulative wildlife habitat loss cannot be determined because the direct impacts of habitat disturbance are species-specific and dependent upon: 1) the status and condition of the population(s) or individual animals being affected; 2) seasonal timing of the disturbances; 3) value or quality of the disturbed sites; 4) physical parameters of the affected and nearby habitats (e.g., extent of topographical relief and vegetative cover); 5) value or quality of adjacent habitats; 6) the type of surface disturbance; and 7) other variables that are difficult to quantify (e.g., increased noise and human presence. As foraging, hunting, breeding, nesting, and rearing habitats are removed, overall quality of wildlife habitat also would decrease. In areas where development has previously occurred, habitat fragmentation may have resulted in the disruption of seasonal patterns or migration routes. Current or previous surface disturbance in the cumulative impacts study area primarily results from residential/subdivision development and home construction as well as construction and operation of associated infrastructure. Other activities such as livestock grazing also contribute to cumulative impacts on wildlife habitat (e.g., reduction of available forage/biomass). The incremental reduction of suitable wildlife habitat and increased habitat fragmentation from the Project would be minor considering the SCPs and the utilization of existing ROWs for the action alternatives.

- Temporary animal displacement: Displaced individuals of any species could be forced into less suitable habitats, possibly resulting in subsequent potential effects of deteriorated physical condition, reproductive failure, mortality, and general distress as important habitat is reduced and animals are displaced. Loss of habitat/forage consequently could result in increased competition between and among species for available resources. Some wildlife species, such as raptors and big game, would be susceptible to these cumulative impacts because encroaching human activities in the cumulative impacts study area has resulted, or would result, in animal displacement in areas that may be at their relative carrying capacity for these resident species.

  Many of the local wildlife populations (e.g., small game, migratory birds) that occur in the cumulative impacts study area likely would continue to occupy their respective ranges and breed successfully, although population numbers may decrease relative to the amount of cumulative habitat loss and disturbance from incremental development. Displacement of individuals also could reduce hunting success in the area. The incremental animal displacement caused by the proposed rebuild alternatives and the No Action Alternative would be temporary during construction and minor in intensity due to the abundance of available habitat within and adjacent to the Project vicinity. Based on design criteria proposed for breeding raptors and avian species, incremental long-term displacements are not expected to occur from the Project alternatives.

- Decreased reproductive success: A decrease in reproductive success and physical condition from increased energy expenditure due to physical responses to disturbance could lead to increased mortality. Incremental decreases due to the Project alternatives would be low considering the short duration of construction and maintenance activities.

- Increased vehicle/wildlife collisions: An increase in traffic levels within the cumulative impacts study area during construction has the potential to incrementally increase vehicle/wildlife collisions. Potential increased human utilization of resources through hunting and other recreational activities that would expose wildlife to potential human harassment, either inadvertent or purposeful, would increase wildlife collisions. However, because the Project would utilize existing ROWs and vehicle speeds would be low due to road types and conditions, the incremental increases in wildlife collisions would be minor.

Details regarding specific cumulative effects to wildlife species identified as potentially occurring within the Project area are discussed below.

5.9.1 Big Game

Cumulatively, on-going activities on private lands such as continued home building and its associated activities (infrastructure, power lines, etc.) and recreation have the most potential to affect these species by encroaching on their range, altering habitat use patterns, and increasing hunting pressure due primarily to increased public access. However, this increase in access for the Project is anticipated to be minor and is likely to result in a negligible increase in overall hunting pressure.

Big game species within the Project area utilize all habitats impacted by the Project. Impacts to riparian habitats important to black bear and moose would be negligible. Approximately 6 acres of surface water and less than 0.5 acre of shrub riparian areas are located within the FTAs.

Vegetation management within the FTAs may impact forage quality for deer and elk. Forage conditions would likely remain the same or improve slightly in the FTAs, as most canopy cover would be retained or reduced, resulting in a similar to greater amounts of light and moisture reaching the forest floor. Hiding and thermal cover and migration corridors would likely be degraded as removal of canopy cover, ladder fuels, and the crushing of understory plants with vegetation management machinery would result in temporarily reduced amounts of horizontal cover. However, incremental impacts to foraging habitat are anticipated to be minor in significance and not result in the decline of local populations due to the abundance of available habitat within the Project vicinity.

None of the past, present, and reasonably foreseeable future activities discussed above would have appreciable impacts to preferred mountain lion habitat within the study area because they generally do not occur within steep, rocky terrain. Recreational activities within the study area would have the most potential to create avoidance of otherwise suitable habitat. Additional impacts to mountain lion populations would directly correlate with the effects of actions on deer populations. However, incremental impacts to deer habitat are anticipated to be minor and would not result in the decline of local populations due to the abundance of available habitat within the Project vicinity.

Therefore, the Project is not expected to lead to or contribute to appreciable cumulative effects for big game species when added to impacts from past, present, and reasonably foreseeable future activities.

5.9.2 Raptors, Game Birds, and Other Bird Species

As discussed in Section 3.9, a variety of raptor and songbird species utilize the Project vicinity. Cumulatively, on-going activities on private lands such as continued home building and its associated activities (infrastructure, power lines, etc.) and recreation have the most potential to affect these species by encroaching on their range, altering habitat use patterns, and increasing hunting pressure on upland game birds due primarily to increased public access. However, this increase in access for the Project is anticipated to be minor and is likely to result in a negligible increase in overall hunting pressure.

Within FTAs, the amount of suitable habitat impacted is detailed above in **Table 5.9-1**. Species associated with forested habitats generally would be more susceptible to cumulative effects due to the long-term nature for these habitats to re-establish. Within the FTAs, approximately 4,864 forested acres may be subject to timber management practices. However, Forest Plan goals and desired conditions generally would lead to the maintenance or improvement over time of forest habitat for these species, which are associated with or forage around mature forested habitats. For these species, the FTAs should lead to improved habitat conditions over time by maintaining and developing more rapidly (than without thinning activities) mature and old-growth forest habitat conditions, which would benefit potential nesting and roosting habitat. Given this and the Forest Plan direction for the analysis area, the Project is not expected to lead to or contribute to appreciable cumulative effects for these species, when added to impacts from past, present, and reasonably foreseeable future activities.

Special status or sensitive bird species are discussed in Section 5.10.

5.9.3 Amphibians and Reptiles

The majority of common amphibians and reptile species found in Colorado have life history requirements linked to the presence of aquatic habitats. Cumulative impacts to surface waters are discussed in Section 5.5. Cumulatively, on-going activities on private lands such as continued home building and its associated activities (infrastructure, power lines, etc.) and recreation have the most potential to affect these species by encroaching on their range and altering habitat use patterns. The two FTAs would have minimal impacts to suitable habitat for these species. Approximately 6 acres of surface water and less than 0.5 acre of shrub riparian areas are located within the FTAs. Therefore, the Project would not result in or contribute to appreciable cumulative impacts for these species.

Special status or sensitive amphibian species are discussed in Section 5.10.

The incremental impacts from this Project and ongoing and future development in the cumulative impacts study area would cumulatively reduce the ability of wildlife habitats in the cumulative impacts study area to support wildlife populations at their current levels for the lifetime of the anticipated

Project-related development, production, and reclamation. Cumulative impacts would continue until such time that reclamation is deemed successful. Successful reclamation is assumed to re-establish wildlife habitats to pre-disturbance conditions.

Based on the large amount of available habitat and minimal amount of past, present, and reasonably foreseeable actions within the cumulative impacts study area, no impacts to genetic diversity or biodiversity would be expected. It is anticipated that cumulative impacts to wildlife would not be significant.

5.10 Special Status and Sensitive Wildlife Species

The cumulative impacts study area, as well as past and present actions and reasonably foreseeable future actions reviewed for special status species is the same as described in Section 5.9, Wildlife. As discussed in Section 5.9, wildlife species have been cumulatively impacted by past and present activities and would be incrementally impacted from any action alternative. The impacts generally would be the same as discussed above in Section 5.9, Wildlife. Species associated with forested habitats generally would be more susceptible to cumulative effects due to the long-term nature for these habitats to re-establish. In general, the severity of the cumulative effects would depend on factors such as the sensitivity of the species impacted, seasonal intensity of use, type of action, and physical parameters (e.g., topography, forage, and cover availability). Details regarding specific cumulative effects to special status and sensitive species identified as potentially occurring within the study area are discussed below.

5.10.1 Townsend's Big-eared Bat

Cumulatively, on-going activities on private lands such as continued home building and its associated activities (infrastructure, power lines, etc.) and recreation have the most potential to affect these species by encroaching on their range and altering habitat use patterns. Within the FTAs, approximately 4,864 acres of forested acres may be subject to timber management practices. However, vegetation management activities associated with the designated FTAs in the study area would result in beneficial impacts for the Townsend's big-eared bat. The proposed thinning treatments would treat primarily understory trees, and leave most of the mature overstory trees within potential foraging habitat. FTA treatments would have a long-term positive effect on foraging habitat due to maintaining and restoring more open forest conditions of ponderosa pine and mixed Douglas-fir/ponderosa stands in the treatment units. The thinning also would reduce the risk of wildfire. The clearcut treatment units may create foraging habitat by creating openings and edge habitat in what currently is dense single-story lodgepole pine stands. Consequently, there is low potential for adverse cumulative impacts to occur for this species from implementation of the FTA treatments or the Project.

5.10.2 Mexican spotted owl, Fringed Myotis, Hoary Bat, Northern Goshawk, Flammulated Owl, Lewis' Woodpecker, Olive-sided Flycatcher, Golden-crowned Kinglet, and Pygmy Nuthatch

Cumulatively, on-going activities on private lands such as continued home building and its associated activities (infrastructure, road building, etc.) and recreation have the most potential to affect these species by encroaching on their range and altering habitat use patterns. Within the FTAs, approximately 4,864 acres of forested acres may be subject to timber management practices. However, with regard to these USFS sensitive species, Forest Plan goals and desired conditions generally would lead to the maintenance or improvement over time of forest habitat for these species, which are associated with or forage around mature forested habitats. For these species, the FTAs should lead to improved habitat conditions over time by maintaining and developing more rapidly (than without thinning activities) mature and old-growth forest habitat conditions, which would benefit potential nesting and roosting habitat. Given this and the Forest Plan direction for the analysis area, the Project would not be expected to lead to or contribute to appreciable cumulative effects for these species, when added to impacts from past, present, and reasonably foreseeable future activities.

5.10.3 American Marten

None of the past, present, and reasonably foreseeable future activities discussed above would have appreciable impacts to marten habitat within the analysis area because they generally do not occur within potential marten habitat. The activities have occurred or would occur at lower elevations outside of higher-elevation potential marten habitat. Within the FTAs, approximately 150 acres of spruce-fir and 2,000 acres of lodgepole pine may be subject to timber management practices. However, the habitat quality for marten in these stands is low because of the predominantly small size class (diameter at breast height) of lodgepole pine, lack of multi-story structure, and lack of downed wood. These stands generally are single-story stands with little downed wood or horizontal structure, which is prevalent in preferred or high-quality marten habitat, such as late-successional spruce-fir forests. Because only a limited amount of low-quality potential marten habitat would be impacted by the FTAs, the Project would not result in or contribute to appreciable cumulative impacts for marten.

5.10.4 Preble's Meadow Jumping Mouse, Bald Eagle, Wilson's Warbler, Boreal Toad, Northern Leopard Frog, Common Gartner Snake, Arapahoe Snowfly, and Hudsonian Emerald Dragonfly

Cumulatively, on-going activities on private lands such as continued home building and its associated activities (infrastructure, powerlines, etc.) and recreation have the most potential to affect these species by encroaching on their range and altering habitat use patterns. The two FTAs would have minimal impacts to suitable habitat for these species. Approximately 6 acres of surface water and less than 0.5 acre of shrub riparian areas are located within the FTAs. Additionally, regarding bald eagle nesting and roosting trees, typically large mature trees are not targeted for removal. Therefore, neither the FTAs nor the Project would result in or contribute to appreciable cumulative impacts for these species.

5.10.5 Peregrine Falcon

None of the past, present, and reasonably foreseeable future activities discussed above would have appreciable impacts to peregrine falcon habitat within the study area because they generally do not occur within potential peregrine falcon nesting habitat. Recreational activities within the study area would have the most potential to create avoidance of otherwise suitable habitat. Although a known peregrine falcon eyrie is located within the general area of the Project vicinity (Cedar Creek Associates 2014), suitable nesting habitat for peregrines does not exist within the two FTAs. The use of ponderosa pine forests for foraging may be impacted by their cumulative reduction of approximately 2,000 acres. However, incremental impacts to foraging habitat is anticipated to be minor in significance and not result in the decline of local populations due to the abundance of available habitat within the Project vicinity. Therefore, neither the Project nor the FTAs would result in or contribute to appreciable cumulative impacts for these species.

5.10.6 Elk and Mule Deer

Cumulatively, on-going activities on private lands such as continued home building and its associated activities (infrastructure, powerlines, etc.) and recreation have the most potential to affect these species by encroaching on their range and altering habitat use patterns. Forage conditions are likely to remain the same or improve slightly in the FTAs, as most canopy cover will be retained, resulting in a similar amount of light and moisture reaching the forest floor. Hiding, thermal cover, and migration corridors would likely be degraded because removal of ladder fuels and the crushing of understory plants with machinery would result in reduced amounts of horizontal cover. However, incremental impacts to foraging habitat is anticipated to be minor in significance and not result in the decline of local populations due to the abundance of available habitat within and adjacent to the Project vicinity. Therefore, neither the Project nor the FTAs would result in or contribute to appreciable cumulative impacts for these species.

5.10.7 Mountain Bluebird

Cumulatively, on-going activities on private lands such as continued home building and its associated activities (infrastructure, powerlines, etc.) have the most potential to affect this species by encroaching on their range and altering habitat use patterns. The treatments proposed would occur primarily within stands and therefore are not likely to influence primary habitat for mountain bluebirds. The FTAs would impact approximately 375 acres of open grasslands and shrub land habitats utilized by this species. However, the current vegetation in the study area is underrepresented in mature stand types which provide the larger trees and snags with suitable cavities for bluebird nesting. Treatments within the FTAs are expected to create opportunities for stands to develop into mature structure and maintain existing snags unless they are a safety concern. Existing nest trees and the structure associated with them should still be available to provide nesting opportunities, as well as prey habitat. The clearcut treatment within the FTAs may create openings and edge habitat in what currently is dense single-story lodgepole pine stands. Therefore, neither the FTAs nor the Project would result in or contribute to appreciable cumulative impacts for these species.

5.10.8 Hairy Woodpecker

None of the past, present, and reasonably foreseeable future activities discussed above would have appreciable impacts to woodpecker habitat within the analysis area because this species is considered secure in Colorado. Cumulatively, on-going activities on private lands such as continued home building and its associated activities (infrastructure, power lines, etc.) have the most potential to affect this species by encroaching on their range and altering habitat use patterns. Within the FTAs, approximately 4,864 acres of forested acres may be subject to timber management practices. However, the habitat quality for the hairy woodpecker in these stands is low because of the predominantly small size class (diameter at breast height) of lodgepole pine, lack of multi-story structure, and lack of downed wood. The FTAs represent a variety of proposed activities that would likely move to balance young to mature forested habitats. Mature stands and grasses are currently underrepresented in these areas. Treatments are expected to create opportunities for stands to develop into mature structure. Design criteria would maintain existing snags unless they become a safety concern. Reduction of the extent and intensity of wildfire would not benefit this species, because they are an abundant post-fire species. Neither the Project nor the FTAs would not result in or contribute to appreciable cumulative impacts for these species.

In summary, no cumulative impacts to special status wildlife species are anticipated under the No Action Alternative. For any action alternative, incremental impacts to special status wildlife species would be minor. The cumulative impacts to special status wildlife species would be additional losses of habitat and habitat degradation over the lifetime of this Project and other actions. On federally managed lands (and in many cases, on State of Colorado lands and private lands), operators/ proponents are typically required to conduct pre-construction surveys in potential or known habitats of threatened, endangered, or otherwise special status wildlife species. These surveys would help determine the presence of any special status wildlife species or extent of habitat. Protective measures then would be developed in consultation with the USFS, DOI, CPW, and USFWS to avoid or minimize direct disturbance in these habitats.

5.11 Land Use and Recreation

The cumulative impacts study area for land use and recreation is the same as the direct effects study area and includes a 1-mile buffer around the Project centerline. Past and present actions and reasonably foreseeable future actions may have environmental consequences on land use activities. These actions have had or would have the potential to create short-term disruptions to land uses as a result of surface disturbances. In general, cumulative impacts to land uses would result in short-term impacts to land uses during construction activities and long-term benefits after construction because land uses would either resume or be enhanced due to more available acreage.

The past and present actions and reasonably foreseeable future actions within the cumulative impacts study area that may have cumulative impacts on recreation include:

- Big Thompson Fuel Reduction Project – USFS;
- Chimney Hollow Reservoir – NCWCD and Larimer County Natural Resources Department;
- Vegetation Management Projects – Western; and
- Private development.

All of these projects have had or would have the potential to result in impacts to recreation opportunities and experiences due to delays in accessing a site, noise and visual disturbances to the recreation setting, surface disturbance that results in vegetation removal and bare ground, or disturbance to wildlife. Effects from the proposed Chimney Hollow Reservoir would include additional recreation opportunities provided at the reservoir. Effects to the recreation setting from creation of the reservoir would be long-term.

As described in Section 4.11.5, incremental impacts from this Project would affect recreational resources in the vicinity, particularly hunting and four-wheel drive/OHV use, depending on the timing and location of the use relative to the Project construction schedule. Cumulative impacts from any action alternative would be moderate or less in intensity and would be short-term, except for transmission line relocations near Pinewood Reservoir; these relocations would have long-term effects on the recreation setting as a result of the higher, more visible towers. Cumulative impacts on four-wheel drive use on West Pole Hill Road would remain moderate to significant.

5.12 Visual Resources

The cumulative impacts study area for visual resources is the same as for direct and indirect impacts. All of the past, present, and reasonably foreseeable future actions described in Section 5.1 may have environmental consequences on scenic resources. Overall impacts from such combined actions would be significant, but the Project increment would not contribute much to the total effect, and would not push the impacts to a new level. In addition, other electric transmission and distribution lines within or near the Project area contribute to cumulative visual effects. Wood and steel pole distribution lines present in residential subdivisions crossed by the Project also contribute to cumulative visual effects.

The existing landscape character is defined by a combination of dense conifer stands in mountainous areas and open, shrub and grass covered foothills fragmented by small towns and rural subdivisions. Until recently, the forested areas provided limited visibility in the immediate foreground due to mature mixed conifer and ponderosa stands. However, extensive mountain pine beetle infestations have and are presently affecting large portions of these stands, resulting in a brown hue to the forest and pockets of die-off throughout the analysis area. Mechanical and prescribed burn forest treatments would continue to be implemented in response to mountain pine beetle infestations. As a result of large-scale forest succession and planned treatments, the existing landscape character would likely transition from a densely forested, uniform-aged evergreen condition to a mosaic of open patches of grasses, shrubs, aspen, and evergreen forests of varying age classes. Although forest management including wildfires may have short-term adverse effects, the resulting long-term condition would have negligible to beneficial effects on scenic quality and scenic integrity. As tree mortality, wildfires, and tree clearing activities related to mountain pine beetle continue to increase, the Project alternatives would become more visible. Adverse impacts to the visual experience of sensitive viewers would increase until regrowth occurs to screen the transmission line(s) in forested areas, although beneficial impacts to sensitive viewer visual experience would result from ROW abandonment and subsequent regrowth to natural conditions.

Past actions also have modified the landscape character, including reservoir development and water conveyance infrastructure, transmission and distribution electrical infrastructure, state highway and local transportation networks, and residential and commercial land development. Past actions have been concentrated in the Estes Valley and, to a lesser extent, near Flatiron Reservoir. The existing scenic values and recreational opportunities continue to attract recreational and residential development. Land conversion from ranching and natural open space landscapes to more intensive recreational resorts and residential and commercial subdivisions with requisite electric utilities would likely continue in the foreseeable future. Land development and forest fragmentation would result in a loss in scenic quality and scenic integrity.

Present and reasonably foreseeable transmission replacement, maintenance, and vegetation management activities by Western in the analysis area would result in similar adverse effects as the Project. In combination with past, present, and reasonably foreseeable future actions, the Project's continuation of vegetation maintenance and structure replacement would incrementally contribute to adverse visual character changes in the region. However, these effects would occur to a lesser degree from an action alternative than for existing conditions, where two ROWs are being maintained instead of one. Further, openings within forested areas from large-scale die-off, wildfires, forest succession, planned treatments, and new residential and commercial uses would potentially increase visibility of the Project. Because the Project replaces an existing transmission line with limited use of new ROW, effects are reduced relative to an entirely new ROW in an area without an existing transmission line. The incremental contribution to long-term adverse cumulative effects from any new construction would be minor and adverse. However, under most action alternatives (including the APA), these would be offset by overall effects which include abandoning existing ROW and allowing it to return to natural vegetation (see Section 2.2.1).

5.13 Socioeconomics and Environmental Justice

The cumulative impacts study area for socioeconomic resources is the same as the direct effects study area with an emphasis on the Town of Estes Park.

Past and present actions and reasonably foreseeable future actions that may have environmental consequences on socioeconomics and environmental justice include the following projects:

- Big Thompson Fuel Reduction Project – USFS;
- Chimney Hollow Reservoir – NCWCD and Larimer County Natural Resources Department;
- Vegetation Management Projects – Western; and
- Continuing residential development.

These actions have had or would have the potential to create short-term cumulative benefits to the local economy as a result of construction activities. Past and present actions and reasonably foreseeable future actions would not: permanently displace an existing residence or business; result in a population increase that would create housing shortages and excessively burden local resources; reduce economic viability of a major sector of a community, ranch, or other business; or impact environmental justice populations. Incremental impacts to cumulative socioeconomic considerations from this Project would include minor effects on property values adjacent to the Project alternatives, and an incremental increase in reliable energy transmission.

5.14 Electrical Effects and Human Health

The cumulative impacts study area for electrical effects and human health is the same as the direct effects study area. No Project alternative is anticipated to cause electrical effects or impacts to human health. Therefore, there would be no incremental impacts on cumulative human health considerations.

5.15 Cultural Resources and Native American Traditional Values

The cumulative impacts study area includes the APE described in Section 4.15, plus a 2-mile buffer. Currently, past and present actions and reasonably foreseeable future actions relevant to these resources in this area are limited to:

- Residential/subdivision development and home construction on private lands primarily along the main roadways along the valley bottoms and in the North Fork Little Thompson River Drainage, including associated infrastructure (roads, power lines, etc.);
- Livestock grazing in the one active grazing allotment;
- Timber harvest over the last 100 years for homesteads and ranches;
- Recreational motorized use; and
- Disturbance from recreational hunting pressure.

This Project is not anticipated to appreciably contribute to unavoidable adverse cumulative impacts. Indirect effects, such as illegal collecting of artifacts, would likely continue to occur at current levels in the cumulative impacts study area as a result of increased access and continued development in the area. However, there are few prehistoric resources in the study area. Thus, there would be little or no incremental contribution to cumulative impacts from direct or indirect Project effects.

5.16 Transportation Resources

The cumulative impacts study area for transportation resources is the same as the direct effects study area. Past and present actions and reasonably foreseeable future actions that may have environmental consequences on transportation resources include the following projects:

- Big Thompson Fuel Reduction Project – USFS;
- Chimney Hollow Reservoir – NCWCD and Larimer County Natural Resources Department; and
- Vegetation Management Projects – Western.

These actions have had or would have the potential to create localized congestion on the regional road network through increased vehicle trips. In general, the Project alternatives would incrementally increase cumulative impacts to transportation resources, creating short-term delays during construction activities, particularly if several projects were implemented at the same time. These possible temporary delays would cease after completion of construction activities. As a result, only minor contributions to cumulative impacts from this Project are anticipated.

5.17 Accidents and Intentional Acts of Destruction

The cumulative impacts study area for accidents and intentional acts of destruction includes the analysis area and the surrounding electrical transmission network. Safety for maintenance workers and the public would be improved with any of the Project alternatives. No Project alternative is anticipated to result in an increased risk of Intentional acts of destruction. Therefore, there would be no Project impacts contributing to cumulative impacts.

6.0 Preparers, Agencies and Persons Consulted, and Distribution List

6.1 List of Preparers

The individuals listed in **Table 6.1-1** and **Table 6.1-2** were actively involved with the preparation of this EIS.

Table 6.1-1 Lead and Cooperating Agency Staff

Name	Agency	Project Role
Mark Wieringa	Western	NEPA Document Manager
Tim Snowden	Western	NEPA Document Manager
Dave Swanson	Western	Contract Environmental Specialist/NEPA
Greg Johnson	Western	Project Manager
Carey Ashton	Western	Land and Realty Specialist
Allen Turner	Western	Electrical Engineer
Ron Turley	Western	Vegetation Management
Stacy Huss Ginsberg	Western	General Counsel/Legal Sufficiency Review
Ree Rodgers	Western	Archaeologist
Katie Donahue	U.S. Forest Service	District Ranger
Sue Greenley	U.S. Forest Service	NEPA Document Manager/Lands Staff
Karen Roth	U.S. Forest Service	Forest Environmental Coordinator/NEPA
Reghan Cloudman	U.S. Forest Service	Public Affairs
Kevin Colby	U.S. Forest Service	Landscape Architect/Visual Resources
Laura Shaffer	U.S. Forest Service	Recreation
Dick Edwards	U.S. Forest Service	Fire, Fuels, and Timber Management
Dale Oberlag	U.S. Forest Service	District Wildlife Biologist
Steve Popovich	U.S. Forest Service	Forest Botanist
Deb Entwistle	U.S. Forest Service	North Zone Hydrologist
Lizandra Nieves-Rivera	U.S. Forest Service	Soils
Sue Struthers	U.S. Forest Service	Forest Archeologist
Kipp Klein	U.S. Forest Service	Engineer
Janice Naylor	U.S. Forest Service	GIS

Table 6.1-2 EIS Contractors

Name	Firm	Project Role	Academic Credentials
Anne Doud	AECOM	Project Manager/NEPA	MS, Ecology BS, Biology
Jim Paulson, P.E.	AECOM	Senior Reviewer	BS, Civil Engineering
Steve Graber	AECOM	Land Use, Socioeconomics, Electrical Effects and Human Health, Transportation, Accidents and Intentional Destructive Acts	BS, Natural Resources Management; BA, Economics
Terra Mascareñas	AECOM	Soils	BS, Soil and Crop Science
Bill Berg, P.G.	AECOM	Geology and Paleontology	MS, Geology
Anne Ferguson	AECOM	Recreation	MS, Environmental Sustainability BS, Natural Resource Recreation and Tourism
Kim Munson	AECOM	Cultural Resources	MA, Anthropology
Andrew Newman	AECOM	Wildlife Biology	BS, Wildlife Management
Patti Lorenz	AECOM	Wildlife Biology	BS, Wildlife Biology
Erin Bergquist	AECOM	Vegetation, Wetlands	MS, Ecology
Amy Gilboy	AECOM	Vegetation	MS, Resource Ecology and Management BS, Biology
Jim Burrell	AECOM	Water Resources, Wetlands	MS, Civil Engineering BS, Forest Management
Paul Swartzinski	AECOM	Forestry and Fire Management	MS, Restoration Ecology BS, Rangeland Ecology
Courtney Taylor	AECOM	Air Quality	MS, Atmospheric Science BA, Environment, Economics, and Politics
Ben Tracy	AECOM	GIS Analyst	BS, Natural Resources
Bruce Meighen	Logan Simpson Design	Principal, Public Involvement	Master of City Planning
Tom Keith	Logan Simpson Design	Principal, Senior Reviewer	MS, Regional Resource Planning
Tanya Copeland	Logan Simpson Design	Project Management	MS, Ecology and Evolution
Merlyn Paulson	Merlyn Paulson, Inc.	Visual Resources	MLA, Landscape Architecture II BLA, Landscape Architecture and Environmental Planning Studies in Ecology and Landscape Architecture
Jeremy Call	Logan Simpson Design	Visual Resources	MLA, Landscape Architecture
Jeremy Palmer	Logan Simpson Design	Visual Simulation	AAS, Computer Animation
Ryan McClain	Logan Simpson Design	Visual Simulation	BS, Landscape Architecture

Table 6.1-2 EIS Contractors

Name	Firm	Project Role	Academic Credentials
Casey Smith	Logan Simpson Design	GIS Analyst	BS, Natural Resources Management and GIS
Kristy Bruce	Logan Simpson Design	GIS Analyst	Master of Landscape Architecture

6.2 List of Agencies and Persons Consulted

Individuals consulted during preparation of the EIS are listed in **Table 6.2-1** below. These individuals were interviewed at the onset of the EIS process to help define issues and develop the public participation plan for the EIS.

Table 6.2-1 List of Agencies and Persons Consulted

Name	Agency or Organization	Role or Title
Edward Nichols	Office of Archaeology and Historic Preservation	State Historic Preservation Officer
Susan Linner	U.S. Fish and Wildlife Service	Colorado Field Supervisor
Leslie Ellwood	U.S. Fish and Wildlife Service	Biologist
Larry Gamble	National Park Service, Rocky Mountain National Park	Chief, Branch of Planning and Compliance
Lara Rozzell	National Park Service, Intermountain Region	Ecologist/Renewable Energy Specialist
Pam Shaddock	U.S. Senator Mark Udall, Northeast Office	Regional Director
James Thompson	U.S. Senator Michael Bennet	Regional Director
Dan Betts	U.S. Senator Cory Gardner	Aid to Senator Cory Gardner
Jeffrey Boring	Larimer County Natural Resources Department	Resource Specialist II
Robert Helmick	Larimer County Planning	Senior Planner
Frank Lancaster	Town of Estes Park	Town Administrator
Reuben Bergsten	Town of Estes Park	Utilities Director
Chris Bieker	Upper Thompson Sanitation District	District Manager

6.3 Final EIS Distribution List

6.3.1 Federal, State, and Local Agencies and Officials, and Project Partners

An electronic or printed copy of the Final EIS was distributed to the elected officials, tribal representatives, agencies, and other organizations identified in **Table 6.3-1** below.

Table 6.3-1 Final EIS Distribution List

Name/Title	Organization
Federal Elected Officials	
Senator Cory Gardner	U.S. Senate
Senator Michael Bennet	U.S. Senate
Congressman Jared Polis (District 2)	U.S. House of Representatives
Congresswoman Diana DeGette (District 1)	U.S. House of Representatives
Congressman Ed Perlmutter (District 7)	U.S. House of Representatives
Tribal Representatives	
The Honorable Janice Prairie Chief Boswell, Governor	Cheyenne and Arapaho Tribes of Oklahoma
Ms. Karen Little Coyote, Cheyenne Director, Culture and Heritage	Cheyenne and Arapaho Tribes of Oklahoma
Mr. Max Bear, Arapaho Director, Culture and Heritage	Cheyenne and Arapaho Tribes of Oklahoma
Mr. William C'Hair	Northern Arapaho Language and Culture Commission
Mr. Yufna Soldier Wolf, Tribal Historic Preservation Officer	Northern Arapahoe Tribe of The Wind River
Ms. Teanna Limpy, Tribal Historic Preservation Officer	Northern Cheyenne Tribe
The Honorable Clement Frost, Chairman	Southern Ute Indian Tribe
Mr. Alden Naranjo, NAGPRA Representative	Southern Ute Indian Tribe
The Honorable Ronald Wopsock, Chairman	Ute Indian Tribe
Ms. Betsy Chapoose, Director of Cultural Rights and Protection	Ute Indian Tribe
State Elected Officials	
Governor John Hickenlooper	Governor of Colorado
Senator Kevin Lundberg (15th District)	Colorado General Assembly
Representative Perry Buck (49th District)	Colorado General Assembly
Federal Agencies	
Mr. Philip Thomas, Program Director	NEPA Compliance and Review Program, EPA Region 8
Mr. Monti Williams, Forest Supervisor	USDA Forest Service, Arapaho-Roosevelt National Forests and Pawnee National Grasslands
Ms. Katie Donahue, District Ranger	USDA Forest Service, Arapaho-Roosevelt National Forests and Pawnee National Grasslands
Ms. Leslie McFadden, Lands Staff	USDA Forest Service, Arapaho-Roosevelt National Forests and Pawnee National Grasslands
Ms. Michaela Noble, Director	Office of Environmental Policy and Compliance, Department of the Interior
Mr. Mike Collins, Eastern Colorado Area Manager	U.S. Bureau of Reclamation
Ms. Lucy Maldonado, Environmental Specialist	U.S. Bureau of Reclamation
Mr. Larry Gamble, Chief	Branch of Planning and Compliance, Rocky Mountain National Park
State Agencies	
Mr. Bob Randall, Executive Director	Colorado Department of Natural Resources
Mr. Bill Ryan, Director	State Land Board

Table 6.3-1 Final EIS Distribution List

Name/Title	Organization
Mr. Bob Broscheid, Director	Colorado Parks and Wildlife
Mr. Larry Wolk, Executive Director	Colorado Department of Public Health and Environment
Local Agencies/Officials	
Mr. Tom Donnelly, County Commissioner (District 3)	Larimer County Commissioners Office
Mr. Terry Gilbert, Community Development Director	Larimer County Planning and Building Services
Mr. Robert Helmick, Senior Planner	Larimer County Planning and Building Services
Mr. Gary Buffington, Director	Larimer County Natural Resources Department
Mr. Meegan Flenniken, Resource Specialist II	Larimer County Natural Resources Department
Mr. Frank Lancaster, Town Administrator	Town of Estes Park
Mr. Reuben Bergsten, Director	Town of Estes Park Utilities Department
Mr. Chris Bieker, District Manager	Upper Thompson Sanitation District
Mr. John Collins, Director of Power Delivery	Platte River Power Authority
Other Organizations and Stakeholders	
Mr. Thomas Gootz, Director	Association for Responsible Development
Mr. Kirk Cunningham	Sierra Club, Rocky Mountain Chapter
Mr. Christopher Jones and Ms. Kimberly Krohmer	Responsible Lines
Mr. Frank Morgan	Horsetooth Four Wheelers
Mr. Tom Adams, Ranch Manager	Crocker Ranch
Interested Party	Estes Park Baptist Church

6.3.2 Individuals Receiving Copies of the Final EIS

The Final EIS is available on the project website at http://go.usa.gov/rvtP. In addition, a printed copy of the Final EIS Summary and a transmittal letter containing a link to download the full Final EIS was mailed to approximately 400 individuals on the project mailing list. The project mailing list includes affected landowners, individuals that provided comments during the public scoping period, individuals on the notification list maintained by the USFS, and other stakeholders.

The following individuals also received a compact disk (CD) copy of the full Final EIS, per their request.

Name	Name	Name	Name
Michael Aldridge	Kevan and Roberta Davidson	Harihara Mohan	Barbara Sax
Teresa Abel	Carol Dreselly	Albert J and Anna Mary Moresco	Dennis Schump
Eric Adams	Craig and Joan Driear	Jeff and Kerri Moore	Pamela Shaddock
George and Melinda Archey	Jean and Ingrid Drouin	Jon Nicholas	Reggie and Mary Elizabeth Smith
Russell Atwood	Audrey Elens	Ron and Joann Nicholson	Neil Snyder
Craig C. Axtell	Trent Forrister	Ron Norris	Elliot Sproul

Name	Name	Name	Name
Jeff Barina	Diane Hackett Carlton	Judy Nystrom	Harry V. Thomas
Thomas Beck	Phillip Hunger	Larry Olson	Andrea Thorne
David and Joann Batey	Steven K. Imig	Kimberly and Neil O'Mally	Neil Van Lieu
Leon and Valentine Berberian	James Kapral	Larry Pearson	Roger Waldfogel
Craig Burke	Craig Knoell	Gordon M. Pedersen	Edward Wheeler
Karen Chionio	Larry Lawson	Thomas and Cheryl Poff	Zeke Williams
Terry Chiplin	Rodger and Erika Libby	Linda Poppe	Linda Wilson
James Cozzie	Helen Miller	Thomas Reed	James Wiegand and Janet Collins

A printed copy of the Final EIS is available for public review at Western's Corporate Services Office (12155 West Alameda Parkway, Lakewood, Colorado); the Loveland Public Library (300 N Adams Avenue, Loveland, Colorado); and the Estes Park Public Library (335 East Elkhorn Avenue, Estes Park, Colorado).

6.4 Contractor Disclosure Statement

Pursuant to 40 CFR 1506.5(c), AECOM, Inc., headquartered at 555 South Flower Street, 4th Floor, Los Angeles, CA 90071-2201, has certified that AECOM and their subcontractors have no financial or other interests in the outcome of this project. A copy of the signed Conflict of Interest Disclosure is on file with Western's Contracting Officer.

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8.0 INDEX

	Section of Route	Alternative	Public or Agency	Comment	Response	Author
Land Use and Recreation	West	General	Agency-USFS	The Summary Tables and Tables in Chapter 2 state significant change to the 4 wheel drive (WD) opportunity but are silent on the change to dispersed recreation. The changes to dispersed recreation should be discussed.	Executive Summary and Chapter 2 comparison tables have been modified to detail the potential beneficial and adverse changes to dispersed recreation from greater recreational access from the improvement of West Pole Hill Road under Alternatives C and C1. Due to Forest Service concerns about improvements to the 4WD section of West Pole Hill Road, Western has determined that no improvements to this section of road would be made as part of the Agency Preferred Alternative (APA). Accordingly, under the APA there would be no effect to the 4WD opportunity or any change in dispersed recreation attributable to the proposed Project with the exception of during actual construction of the project.	Glenn Casamassa
Land Use and Recreation	West	C/C1	Agency-USFS	Alternatives C and C1: The effects of changing from a 4WD challenge road (level 2) to a 2WD passenger car are downplayed for recreation. This is not the case and this should be corrected.	The Alternative C and C1 recreation impact analysis has been augmented to further detail the potential beneficial and adverse impacts to dispersed recreation on USFS lands from the modification of West Pole Hill road from a 4WD road to a 2WD road. The impact assessments described for Land Use and Recreation, **Section 4.11** in the Final EIS, have been modified to reflect this change. Due to Forest Service concerns about improvements to the 4WD section of West Pole Hill Road, Western has determined that no improvements to that section of road would be made as part of the APA. There would be no change to the road or its Forest Service classification under the APA, and subsequently no related long-term change to recreation attributable to the Project. Under the APA, short-term impacts would include temporary congestion or blockage of the road by construction vehicles during certain phases of construction. These impacts should be of very limited duration, primarily occurring when construction equipment is accessing or leaving structure locations, or during conductor stringing.	Glenn Casamassa
Land Use and Recreation	West	General	Agency-USFS	Chapter 3 has a separate section for the existing condition on National Forest System (NFS) lands; however, Chapter 4 does not separate NFS land from other lands in discussing the effects to NFS land. Chapter 4 lumps recreation effects for the entire line. We request that you separate the effects on NFS land.	Per an email from Karen Roth to Western, dated September 20, 2013, USFS management decided to not break out a Forest Service-only section, but to be able to identify and track USFS Key Issues and Effects in Chapter 4. Chapter 4 Key Issues and Effects are listed for USFS lands so those may be evaluated separately. Early in the EIS process, Forest Service management agreed that impacts would not be broken out for the small areas of affected Forest Service managed property. The exception was that the Forest Service requested a separate Transportation Plan prepared to their standards. The Transportation Plan was accordingly produced and accepted by the Forest Service. Since there is documented prior agreement between the agencies that only one impact analysis would be conducted, no changes to the Final EIS were made in response to this comment.	Glenn Casamassa
Land Use and Recreation	West	General	Agency-USFS	Throughout the DEIS you should review how you've stated the effects. For example, if you state there is an effect to recreation, that does not tell the reader whether it is an adverse or beneficial or to what degree the adverse or beneficial effect is. This should be corrected.	The impact analysis has been updated where applicable, and impacts indicated as adverse or beneficial. All impacts should be considered detrimental to environmental resources unless otherwise specified.	Glenn Casamassa
Land Use and Recreation	West	C/C1	Agency-USFS	Suggest providing a map for Alternatives C and C1 showing where the public could go once the Pole Hill Road has become a 2 wheel drive road.	In response to Forest Service concerns about improving the 4WD section of West Pole Hill Road, Western has determined that the Agency Preferred Alternative (APA) would not include improving this road, which would be used for construction and maintenance as is. Therefore, no map as suggested by the Forest Service is needed.	Glenn Casamassa
Land Use and Recreation	West	A/A1/A2, B, and C/C1	Agency-USFS	Table S-4 and Table 2.8-1 Measurement Indicators for Key and Other Issues, Issue: recreation uses & experiences: The effects should be as stated below: Alternative A/A1/A2: Slight beneficial effect due to decommissioning of one of the lines. Alternative B: Low (ROS class would change from roaded natural on the portion where the large poles will be located directly next to the road. The recreation visitors experience would be degraded with large poles directly next to the road.) Alternatives C/C1: Change wording to "significant adverse effects to OHV opportunities". Remove the word – Unquantifiable - in Table 2.8-1 also. This does not show up in Table S-4. Need another row to disclose short-term changes in recreation opportunities on NFS lands. See Section 4.11.3.2 Recreation first paragraph.	Text in **Tables S-5** and **2.8-2** already state that the recreational experience would be enhanced where the current transmission line would be decommissioned . Per public comment letters, the beneficial effect of abandoning a ROW would be more than 'slight'. Additionally, verbiage in both tables under Alternative B currently include the expected impacts to the recreational setting on Pole Hill Road. Per the ROS Users Guide Page 22, powerline structures are included under both Roaded Natural and Rural. The change in powerlines from wood structures to higher steel poles would potentially necessitate a change in ROS from Roaded Natural to Rural. Text was augmented to include the potential for change in ROS class and the subsequent Forest Service Plan Amendment that would be necessary. The Agency Preferred Alternative (APA) would not require a Plan Amendment. Alternative C and C1 text in Tables S-5 and 2.8-2 has been modified to state the significant adverse effects to OHV users. Under the APA the 4WD section of West Pole Hill Road would not be improved, resulting in no adverse impacts to OHV users, except for short-term access restrictions during active construction activities. 'Unquantifiable' was removed from **Table 2.8-1**. Short-term effects are adequately explained in Draft EIS **Section 4.11.3.2** and are insignificant and short enough in duration that adding a new line to the Summary Table would not add to the analysis. **Table S-4** is tied directly to Key Issues and the Management Indicators identified and agreed to jointly by Western and the Forest Service. Those issues underwent thorough evaluation during the EIS analysis.	Glenn Casamassa
Land Use and Recreation	West	All	Agency-USFS	Table S-5 Comparison of Alternative Effects pg. S-19 Recreation and Table 2.8-2 pg. 2-47: Alternative A: Need to state whether impact is beneficial or adverse. Alternative B: "Long-term impacts would include effects to the recreational setting on Pole Hill Road". Add the word "adverse" before effects. All Alternatives must state whether the impacts are beneficial, adverse, or both.	The impact analysis has been updated where applicable, and impacts indicated as adverse or beneficial. All impacts should be considered detrimental to environmental resources unless otherwise specified.	Glenn Casamassa

	Section of Route	Alternative	Public or Agency	Comment	Response	Author
Land Use and Recreation	West	General	Agency-USFS	Chapter 4 Section 4.11.3.2 Recreation: Need to state that the short-term effects are adverse.	The impact analysis has been updated where applicable, and impacts indicated as adverse or beneficial. All impacts should be considered detrimental to environmental resources unless otherwise specified.	Glenn Casamassa
Land Use and Recreation	West	General	Agency-USFS	Chapter 4 Section 4.11.5.2 Recreation pg. 4-96: First paragraph: Need to state that the recreation setting for Alternative B would have a low adverse effect. Fifth line down in first paragraph: "structures associated with Alternatives A and C would affect the recreation setting". Need to state that Alternative C would adversely affect and Alternative A could have both adverse (north line) and beneficial (removing south line) effects. Second paragraph: Disagree with this sentence because Alternative B poles are adjacent to West Pole Hill Road which would change "roaded natural" to "rural" class on this section. Fourth paragraph last sentence: "Whether beneficial or adverse, the effect would be readily apparent and measurable and, therefore, would be of moderate intensity". Delete this sentence because effects cannot be averaged.	The 'recreational setting' in this area is within an existing Forest Service-designated Utility Corridor. According to the Forest Plan direction for these areas, "Human development is obvious and may dominate the foreground views. Both motorized and nonmotorized use occurs in the area." Alternative B would improve the existing recreational setting by eliminating one of two existing ROWs. The 6th paragraph under **Section 4.11.5.2** discusses the beneficial effects of abandoning a transmission line corridor, which would occur under both Alternative B and C. Per the ROS Users Guide Page 22, powerline structures are included under both Roaded Natural and Rural. The change in powerlines from wood structures to higher steel poles would potentially necessitate a change in ROS from Roaded Natural to Rural. Text was augmented in **Sections 2.2.1.9** and **4.11.5.2** to include the potential for change in ROS class and the subsequent Forest Service Plan Amendment that would be necessary. The Agency Preferred Alternative would not require a Plan Amendment.	Glenn Casamassa
Socioeconomics	West	General	Agency-USFS	Chapter 3 Socioeconomics and Community Resources, starting pg. 3-109: Does not include any mention of the 4WD outfitter, Rocky Mountain Rush, permitted by the Forest Service to use Pole Hill Road. This needs to be added to the affected environment in this section because it needs to track with Chapter 4 Socioeconomic section where the effects are mentioned for this outfitter. See pg. 3-84 in the Recreation section last paragraph- this is where the outfitter guide is mentioned. Should be included as well in the Socioeconomic section in Chapter 3 and business name (Rocky Mountain Rush) should be included (see pg. 4-97 top paragraph for existing condition of this outfitter).	Western does not single out commercial entities or private individuals by name in its NEPA documents. Providing names can be construed as a government endorsement or infer special treatment for that individual or entity. OHV touring as well as clarification that there is one OHV authorized permit holder has been added to **Section 3.13**.	Glenn Casamassa
Socioeconomics	West	C/C1	Agency-USFS	Table S-5 Comparison of Alternative Effects – Socioeconomics and Community Resources pg. S-20: Alternative C and C1: "Reconstruction of West Pole Hill Road would result in moderate long-term effects to a Forest Service permit holder that leads OHV tours in the Pole Hill area". This should state <u>significantly adverse</u> short- and long-term effects to the Forest Service authorized permit holder.	**Table S-5** has been revised to reflect significant Alternative C and C1 adverse effects to the Forest Service authorized permit holder. Due to Forest Service concerns about improvements to the 4WD section of West Pole Hill Road, Western has determined that no improvements to this section of road would be made as part of the Agency Preferred Alternative. Under the APA there would be no change to the road or its Forest Service classification, and no impact to the OHV authorized permit holder, except for potentially negligible, temporary access delays during construction in this vicinity.	Glenn Casamassa
Socioeconomics	West	General	Agency-USFS	Chapter 4 Socioeconomic section pg. 4-132 second full paragraph: DEIS states "but would not completely displace the outfitter". This does not accurately display what would happen to the business since they would be losing their main attraction, the challenging 4WD section of West Pole Hill Road. The outfitter has stated this would most likely destroy his business. The DEIS states "the economic effects to this business are anticipated to be significant and long-term." Rather should state "the economic effects to this business are anticipated to be significantly adverse, short and long-term effects". We disagree with the last sentence of this paragraph because as written it downplays the significant adverse effects to this business.	Adverse, short and long-term effects' has been added to Final EIS **Section 4.13** to describe the significant impact to the OHV authorized permit holder under Alternatives C and C1. Under the Agency Preferred Alternative, no improvements to this section of road would be made. Since there would be no change to the road or its Forest Service classification under the APA, there would be no impact to the OHV authorized permit holder except for potentially temporary delays in access during construction in this vicinity. Short-term impacts could be temporary congestion or blockage of the road by construction vehicles during certain phases of construction.	Glenn Casamassa
Visual	West	General	Agency-USFS	A couple of the variations that were developed after the KOPs were identified were the undergrounding of the line on the western end and the moving of the overhead section of the line from the slope up and to the south of the West Pole Hill Road to the shoulder of West Pole Hill Road. The Forest Service Landscape Architect had asked for a visual simulation of these developments from a point west of the Forest Boundary that would take in both the transition of the line from underground to overhead. That transition would necessitate a building and yard and two thickened towers. It would happen on private land next to the Forest boundary and the line would go from the double to single towers as it goes up the West Pole Hill Road.	The Agency Preferred Alternative does not include an underground construction component, so an additional simulation at that KOP was not completed. Western committed to doing additional simulations on the APA route. These additional simulations are presented in **Appendix C** of the Final EIS.	Glenn Casamassa
Visual	West	General	Agency-USFS	Appendix C at KOP 14 – the photograph supplied by the Forest Service Landscape Architect to Jeremy Call (with Logan-Simpson) was taken from the opposite direction on Forest Service land but no visual simulation was prepared which needs to be done.	AECOM replaced the photo at this KOP in **Appendix C** of the Final EIS. Additional visual simulations are presented in **Appendix C** of the Final EIS for the agency preferred alternative.	Glenn Casamassa
Transportation	West	General	Agency-USFS	It is important to note for the transportation resource that maintenance levels and user classifications can differ between agencies and jurisdictions. While the maintenance level classifications of the Forest Service roads are based off a numerical value (1-5), it is more importantly noted that user classifications can differ within a maintenance level. To clarify, as it applies to Pole Hill road, it is currently a Level 2 road servicing high clearance 4x4 vehicles, or a specific (smaller) user class. An upgrade, even within its level status can create access for a larger user class, or low clearance 4x4 vehicles.	Text has been updated to clarify an upgrade to West Pole Hill Road would create access for a larger user class via lower clearance vehicles. See **Section 4.16** of the Final EIS for modified text. Due to Forest Service concerns about improvements to the 4WD section of West Pole Hill Road, Western has determined that no improvements to this section of road would be made as part of the Agency Preferred Alternative.	Glenn Casamassa
Transportation	West	C/C1	Agency-USFS	The DEIS states that a less than significant impact would result from alternatives C and C1. Less than significant would not describe the effects of the transportation system 20 years from now with increases in maintenance, user defined routes and resource disturbance.	Text was augmented to better reflect significant effects associated with Alternative C and C1. The individual resource effects in Chapter 4 were tied directly to the Significance Criteria (found in each resource section in chapter 4) using the Impact Thresholds that are described in Chapter 4. The Significance Criteria, including the terminology used, underwent a thorough review and approval process with the Forest Service before being used in the EIS process.	Glenn Casamassa

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Transportation	West	C/C1	Agency-USFS	Currently the transportation system of Pole Hill is isolated and self-sustaining and serves a small user class (high clearance 4x4). With ANY increase in traffic proposed under alternatives C and C1 the transportation system of Pole Hill would be negatively impacted by allowing a larger user class access (low clearance 4x4).	In this scenario, the terms 'beneficial' and 'adverse' can be highly subjective, and what is beneficial to one aspect or user of the Transportation resource may be adverse to another. Text in Transportation **Section 4.16** has been modified to detail adverse impacts associated with increased maintenance and resource disturbance, and beneficial impacts associated with opening access to a larger group of users. Due to Forest Service concerns about improvements to the 4WD section of West Pole Hill Road, Western has determined that no improvements to this section of road would be made as part of the Agency Preferred Alternative.	Glenn Casamassa
Transportation	West	General	Agency-USFS	Section 4.16 reads with short-term effects from construction based activities. These short-term effects are for the construction activities of the structures themselves. The long-term effects need to be stated if reconstruction of West Pole Hill Road occurs.	**Section 4.16** text has been augmented to better clarify the long-term effects of West Pole Hill Road reconstruction. Western has determined that no improvements to this section of road would be made as part of the Agency Preferred Alternative.	Glenn Casamassa
Transportation	West	General	Agency-USFS	Dismissal of transportation comments were downplayed significantly without communication between resources. Talking through these issues would have helped us to arrive at an acceptable conclusion with the Forest Service position portrayed.	Comment noted.	Glenn Casamassa
Transportation	West	General	Agency-USFS	In Western's response to Forest Service comments, it was stated that "A determination that any increase in traffic would be significant may not be defensible and would establish an awkward precedent" is simply side casting professional judgment. Furthermore a "potential increase in traffic" from a recreational user (OHV/4x4) perspective directly correlates to the transportation system. Recreational users will come in larger quantities because a greater user class will have access.	Western must state that extreme OHV users are not the only constituency that desire access to the National Forest. From the perspective of the larger user class that would have access to the forest with an improved road, improved access would be a positive and beneficial impact. Text in **Section 4.16** has been updated to detail the adverse and beneficial impacts of improving the 4WD section of West Pole Hill Road. Due to Forest Service concerns about improvements to the 4WD section of West Pole Hill Road, Western has determined that no improvements to this section of road would be made as part of the Agency Preferred Alternative.	Glenn Casamassa
Transportation	West	General	Agency-USFS	Maintenance Level (ML) classifications for Forest Service roads are numerical based 1-5, but they are dependent and defined on user comfort (passenger car). References to ML or classifications should note that while changes in classification are not anticipated, changes in user comfort are. With this increase in user comfort there is also a larger user class to the transportation system.	Text in **Section 4.16** has been modified to note that although West Pole Hill Road maintenance level classification may not change, changes in user comfort would result in a larger user class gaining access to the transportation system. Due to Forest Service concerns about improvements to the 4WD section of West Pole Hill Road, Western has determined that no improvements to this section of road would be made as part of the Agency Preferred Alternative.	Glenn Casamassa
Transportation	West	General	Agency-USFS	Section 4.16 Transportation – Paragraph references the wrong sections for key issues and other issues selected for detailed analysis.	Section references have been corrected.	Glenn Casamassa
Transportation	West	C/C1	Agency-USFS	Section 4.16 Transportation – Second sentence – could include "increased traffic" construction based and post construction under alternatives C and C1.	Text in **Section 4.16** has been modified per the comment to include the adverse short-term increase to traffic from construction activities as well as the long-term increases to traffic from reconstruction of Pole Hill Road under Alternatives C and C1.	Glenn Casamassa
Transportation	West	General	Agency-USFS	Section 4.16.1 Methodology – First sentence – states "existing daily traffic counts" curious what those are, where they were obtained and what roads they were taken from? Do these traffic counts reflect the roads on NFS land? Were attempts made to get traffic counts on NFS land?	Existing daily traffic counts were taken from Colorado Department of Transportation and Larimer County for large highways and secondary roads (Mall Road) within the project area and are presented in **Table 3.16.1**. They do not reflect traffic on roads on NFS lands. Text in **Section 4.16.1** has been modified to better describe the data source. If USFS Annual Average Daily Traffic (AADT) counts are available for affected USFS roads within the project area, they were not provided.	Glenn Casamassa
Transportation	West	General	Agency-USFS	Section 4.16.2 Significance Criteria – Another bullet could be added – Creation of road conditions that would increase user comfort and also user access within NFS land.	The Significance Criteria underwent thorough and exhaustive review and comment with the Forest Service to avoid subjective analysis. The individual resource effects in Chapter 4 were tied directly to the Significance Criteria (found in each resource section in Chapter 4) therefore, no bullet was added. Under the Agency Preferred Alternative, due to Forest Service concerns about improvements to the 4WD section of West Pole Hill Road, Western has determined that no improvements to this section of road would be made.	Glenn Casamassa
Transportation	West	All	Agency-USFS	Section 4.16.3 Impacts Common to All Alternatives – Third sentence – "increased vehicle trips during and after construction activities." After needs to be included for future use of the road system by Western and public alike.	As two transmission line corridors are consolidated into one, it is anticipated that maintenance traffic levels would decrease when compared to existing maintenance traffic levels. Furthermore, Western would coordinate with the Forest Service to identify access spur roads that should be gated to discourage the creation of unauthorized user-created trails on National Forest System lands. The following revised text is provided in **Section 4.16.3** Impacts Common to All Alternatives of the Final EIS: "Direct and indirect impacts to transportation resources could come from increases in traffic due to increased vehicle trips during construction. It is anticipated, given the maintenance of only one transmission corridor, that traffic maintenance levels would decrease during operations from existing maintenance levels."	Glenn Casamassa
Transportation	West	All	Agency-USFS	Section 4.16.3 Impacts Common to All Alternatives – Seventh sentence – MUTCD conformance is standard for all road signs.	Text has been modified for clarity. Revised text is provided in **Section 4.16** of the Final EIS: "All road signs would conform to Manual on Uniform Traffic Control Devices (MUTCD) standards."	Glenn Casamassa
Transportation	West	All	Agency-USFS	Section 4.16.3 Impacts Common to All Alternatives – Final sentence – I have stated that there will be a negative impact to the transportation system (and all resources) of the Pole Hill area under alternatives C and C1. Final sentence does not reflect that.	The specific impact analysis for Alternatives C and C1 was not included under Draft EIS **Section 4.16.3**, Impacts Common to All Alternatives, but was located in Draft EIS **Section 4.16.5**, Impacts Unique to Specific Action Alternatives.	Glenn Casamassa
Transportation	West	All	Agency-USFS	Section 4.16.3 Impacts Common to All Alternatives – Second paragraph, sentence eight – and also access to a larger user class.	The specific impact analysis for Alternatives C and C1 was not included under Draft EIS **Section 4.16.3**, Impacts Common to All Alternatives, but was located in Draft EIS Section **4.16.5**, Impacts Unique to Specific Action Alternatives. 'Access to a larger user class' is not an impact common to all alternatives.	Glenn Casamassa

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Transportation	West	No Action	Agency-USFS	Section 4.16.4 No Action Alternative – Last sentence – Long-term impacts would NOT be similar to "Impacts Common to All Alternatives" on NFS lands.	Maintenance and replacement activities for the existing transmission lines under the No Action Alternative would be similar to construction and operational activities as described in Draft EIS **Section 4.16.3** Impacts Common to All Alternatives, and would result in similar short-term and long-term construction and operational impacts. Impacts Unique to Specific Action Alternatives were detailed in Draft EIS **Section 4.16.5.** See **Section 2.2.1.1** middle of first paragraph, "70-80% of structures will be replaced in the near future." Therefore, effects would be similar. Western would in all likelihood rebuild the entire lines over a period of years through their ongoing maintenance program in both ROW's in the near future in the absence of the proposed Project, resulting in access road maintenance and pole replacements along most of both ROWs.	Glenn Casamassa
Transportation	West		Agency-USFS	Section 4.16.5 Impacts Unique to Specific Action Alternatives – Paragraph seven, second sentence – Once again the reconstruction of 122 and 247.D will result in higher user comfort which will result in more users to the area.	Text in **Section 4.16.5** has been modified per the comment. It is likely that the public currently excluded from access would view improved access as highly beneficial, as opposed to the Forest Service view. Due to Forest Service concerns about improvements to the 4WD section of West Pole Hill Road, Western has determined that no improvements to this section of road would be made as part of the Agency Preferred Alternative.	Glenn Casamassa
Transportation	West		Agency-USFS	Section 4.16.5 Impacts Unique to Specific Action Alternatives – Good paragraph but last sentence needs to read "likelihood" rather than possibility, this is professional judgment based on similar projects along the Front Range. This would be an irreversible change to the 4x4 challenge section of the West Pole Hill Road.	Text in **Section 4.16.5** has been modified per the comment. Due to Forest Service concerns about improvements to the 4WD section of West Pole Hill Road, Western has determined that no improvements to this section of road would be made as part of the Agency Preferred Alternative.	Glenn Casamassa
Transportation	West		Agency-USFS	Section 4.16.7 Residual Impacts – First sentence – needs to read "likelihood" rather than possibility.	Text in **Section 4.16.7** has been modified per the comment. Due to Forest Service concerns about improvements to the 4WD section of West Pole Hill Road, Western has determined that no improvements to this section of road would be made as part of the Agency Preferred Alternative.	Glenn Casamassa
Transportation	West	C/C1	Agency-USFS	Table 4.16-2 Access Requirements on National Forest System Land by Alternative – Statement under the table is believed false. Impacts to some degree will occur to the transportation system on NFS land under alternatives C and C1.	Text was augmented to better reflect significant effects associated with Alternative C and C1. The individual resource effects in Chapter 4 were tied directly to the Significance Criteria (found in each resource section in chapter 4) using the Impact Thresholds that are described in Chapter 4. The Significance Criteria, including the terminology used, underwent a thorough review and approval process with the Forest Service before being used in the EIS process.	Glenn Casamassa
Transportation	West	C/C1	Agency-USFS	Section 4.16.8 Irreversible and Irretrievable Commitment of Resources – Once again the lasting access that this project would create under alternatives C and C1 would have an impact to the transportation system.	**Section 4.16.8** was augmented to better reflect effects associated with Alternative C and C1. Due to Forest Service concerns about improvements to the 4WD section of West Pole Hill Road, Western has determined that no improvements to this section of road would be made as part of the Agency Preferred Alternative.	Glenn Casamassa
Transportation	West		Agency-USFS	Section 4.16.9 Relationship Between Local Short-term Uses and Long-term Productivity – Disagree with the second sentence.	**Section 4.16.9** was augmented to better reflect effects associated with Alternative C and C1. Due to Forest Service concerns about improvements to the 4WD section of West Pole Hill Road, Western has determined that no improvements to this section of road would be made as part of the Agency Preferred Alternative.	Glenn Casamassa
Transportation	West		Agency-USFS	Chapter 8.0 INDEX – page 8-2 – Transportation, general comment that pages 3-131 and 4-159 don't exist, page numbers have changed to 3-126 and 4-147.	References to page numbers have been checked for accuracy and corrected where necessary.	Glenn Casamassa
Transportation	West	C/C1	Agency-USFS	Section 1.6.4.2 Other Issues Selected for Detailed Analysis – A bullet can be added to address one of the Forest Service's main concerns relating to the likelihood of increased traffic and resource damage under alternatives C and C1.	Bullet was added: "• Effects of increased traffic and resource damage under Alternatives C and C1 due to West Pole Hill Road improvement."	Glenn Casamassa
Transportation	West	C/C1	Agency-USFS	Table S-5 Comparison of Alternative Effects – Page S-21 – Don't agree with the statements for Alternatives C and C1. Less than significant is not the view of the Forest Service for the future of the transportation system.	Text was augmented to better reflect significant effects associated with Alternative C and C1. The individual resource effects in Chapter 4 were tied directly to the Significance Criteria (found in each resource section in chapter 4) using the Impact Thresholds that are described in Chapter 4. The Significance Criteria, including the terminology used, underwent a thorough review and approval process with the Forest Service before being used in the EIS process.	Glenn Casamassa
Transportation	West	C/C1	Agency-USFS	Table 2.8-2 Comparison of Alternative Effects – Page 2-49 – Don't agree with the statements for Alternatives C and C1. Less than significant is not the view of the Forest Service for the future of the transportation system.	Text was augmented to better reflect significant effects associated with Alternative C and C1. The individual resource effects in Chapter 4 were tied directly to the Significance Criteria (found in each resource section in chapter 4) using the Impact Thresholds that are described in Chapter 4. The Significance Criteria, including the terminology used, underwent a thorough review and approval process with the Forest Service before being used in the EIS process.	Glenn Casamassa

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Transportation	West	General	Agency-USFS	Transportation Conclusion It is apparent through the transportation comments that the Forest Service sees the reconstruction of West Pole Hill road as a negative impact to the transportation system of the Pole Hill area. This stance has never wavered and was never discussed on how it could be clearly portrayed. It has gotten better, but still lacks clarity to show that negative impacts are likely. It was downplayed and dismissed numerous times as indicated by the comment responses provided to the Forest Service by Western and the NEPA Contractor. Construction activities as stated in the DEIS are speaking to the construction of the structures and not the road. Under certain alternatives the reconstruction of Pole Hill Road is required for the power line installation. It is the reconstruction of the road that will produce long-term negative impacts to the Pole Hill transportation system and nearly every resource present within the Pole Hill area. Another area of concern and major point of confusion is that the transportation system on NFS land was not clearly defined. It seemed that more than once the transportation system was considered for the entire project and not separated between jurisdictions. Transportation analysis for NFS land needed its own section, period. When this project crosses NFS land, the transportation analysis changes drastically and they are not related to other public and private systems. This document needs to correctly reference page numbers or sections.	**Section 4.16** has been updated, per USFS comments, to more clearly defined impacts associated with the improvement to West Pole Hill Road. Western agrees that improved access to the forest would attract more forest users, and would result in impacts associated with that increased use. However, it is undeniable that the public currently excluded from access would view improved access as highly beneficial from their perspective, as opposed to the Forest Service's perspective of negative impacts, and both positions have merit. A separate Transportation Plan was produced in response to the Forest Service's request to discuss transportation issues on Forest Service managed areas. Due to Forest Service concerns about improvements to the 4WD section of West Pole Hill Road, Western has determined that no improvements to this section of road would be made as part of the Agency Preferred Alternative. The Final EIS has been reviewed to correct page or section references where needed. Incorrect section references in the first paragraph of **Section 4.16** were corrected.	Glenn Casamassa
Proposed Project	East		Public	Main issue was that the route up around the mountain on the east end of the line would run over/through properties up there. We need to make sure we move this route down the mountain to the north on our next set of maps, maybe to the edge of the burn area as suggested by the residents at the public meetings.	This route (Alternative A) was added to the Draft EIS in response to requests from members of the public who attended the routing workshops. Western is aware of several issues with this route, and it was not selected as part of the Agency Preferred Alternative.	Linda Toppe
Alternative	East	C&D	Public	We are the owners of the historic Pinewood Schoolhouse, located across from the eastern tip of Pinewood Reservoir, and directly in the path of Alternatives C and D for the Estes-to- Flatiron Transmission Lines Rebuild Project. We are also residents in the area who currently have WAPA transmission lines crossing our residential property at 239 Skinner Gulch Road. We would like to sign up to submit a formal oral comment at the October 29, 2014 Public Hearing at the Rialto Theater. Do we sign up that day, or by contacting you? Is there a time limit to the oral comments? Also, we plan to submit further comments in writing, which we understand can be emailed to this address as well, correct?	The section of the existing Western transmission line that passes through the Newell Lake subdivision was proposed for relocation from the beginning of the NEPA process due to encroachment and safety concerns. Information about commenting and the public hearings was provided to the commenter.	Gib and Lisa Coalwell
Alternative		A	Public	We know the very large poles that you'd like to use for this project would not only ruin our view, but seriously diminish the resale value of our home right when we need that money for our retirement. We know the only logical place for poles that big is on the backside of Green Mountain we all live on. I believe you refer to this route as "Alternative A – North Route".	Alternative A was analyzed in direct response to public comments received. A number of issues, including steep terrain, difficult access, and constructability were identified. In addition, Route A would not eliminate visual impacts to residents as there are homes on the back side of Green Mountain as well. This route was not selected to be part of the Agency Preferred Alternative. **Section 2.8** of the Final EIS addresses the rationale for Western's selection of its Agency Preferred Alternative.	Jeff Moore
Alternative	West		Agency-Mayors Office	The Town of Estes Park would like to reiterate its previous position requesting that the Department of Energy consider under-grounding the transmission lines that currently parallel US 36 within the town of Estes Park. In addition, the Town of Estes Park is very concerned that the Town long haul fiber optical lines that are currently in place on WAPA infrastructure along this route will not be replaced on the new project lines. This is critical infrastructure to the Town of Estes Park and its residents and businesses, and in last year's floods it was the ONLY method of communication available during the emergency. Currently this is the only fiber optic link out of the Estes Valley, as the other private line was destroyed during the 2013 flooding. Although the pricate line is being replaced, it will again be located in a vulnerable location, following the Big Thompson River to the Front Range, leaving the town at considerable risk if anoher flood occurs. If the Town is prohibited form including our long haul fiber line on WAPA infrastructure, we may be forced to install another parallel line, including additional poles, and causing additional unnecessary environmental impact. This additional cost to the taxpayers of the Town and additional adverse environmental impact can easily be avoided by the continued co-use of pubilcally owned WAPA infrastructure.	Please see **Section 2.8** of the Final EIS for a discussion of the selection of the Agency Preferred Alternative. For the reasons discussed there, an underground construction option was not selected to be part of the Agency Preferred Alternative. The new transmission line would include a fiber optic ground wire with capacity at least equal to the existing fiber optic connection. However, the allocation and use of the fiber optics is beyond the scope of this EIS, as is the apportionment of the electrical capacity of the transmission line.	Mayor Pinkham
Visual	West		Public	Potential Effects of this Project on Property Values, Landscape Views, and Appearance of Massive Towers for Property Owners in Meadowdale Hills. I would like comments and reassurance regarding the above noted concerns as to what can be expected. A large part of the reasons for residing in or visiting Estes Park is the natural beauty of the area. It seems to me this area is paying a heavy price for the benefit of others far away who could care less about the effects on our community. How. Is this being financed? Will we expect higher regional or federal taxes, and electric bills	As detailed in Draft EIS **Section 2.2.2**, shorter average height structures would be considered in sensitive communities, however, shorter structures mean shorter span lengths, which in turn require more structures. Regarding property values, most studies find little or no effect to property values, especially over time. Additionally, in the case of this project, property values already take into account the presence of the existing transmission lines because they have been built near or against the existing easements. Further information on the potential effects to property values is detailed in Final EIS **Section 4.13**. Western is a Federal agency, but its operations are largely funded through the marketing of Federal hydropower and customer funding, not tax dollars.	Edward Wheeler

	Section of Route	Alternative	Public or Agency	Comment	Response	Author
Alternative	East	B	Public	I live in the Saddle Notch division of the Pole Hill Community, past Pinewood Reservoir. The transmission lines go across and on my property at 16235 West County Road 18 E, the corner of Skinner Gulch Road and 18 E. I attended the Open House held at the Bison Center on Wednesday, September 24th. After looking at the different alternative routes suggested, I am in favor of Alternative B, the south route. It seems the most practical and least invasive of all the alternatives. I would like to see the transmission lines taken off my property permanently.	After consideration of many relevant factors, Western has selected Alternative B for this portion of the Agency Preferred Alternative. Please see **Section 2.8** of the Final EIS for a discussion of the rationale for the selection of the Agency Preferred Alternative.	Belinda Biddle
General	West		Agency-Upper Thompson Sanitation District	Could you please send me a close-up of the exact location of where the alternatives come close to our property on 2200 Mall Rd. and BOR property 2196 Mall Rd. We are currently investigating the acquisition of some additional land from the Crocker ranch folks directly east of those parcels, south of the Big Thompson River and need to know exactly where your proposed transmission line is slated to come down before connecting to the Mall Rd section. The map books do not get to that magnification detail. We need to get this right the first time around.	The requested information was provided to the commenter.	Chris Bieker
Alternative	West	General	Agency-Visit Estes Park	I have a very general question to ask you, although please don't allow this to represent the main area of interest we have in this project. We understand how dynamic and expensive this entire project is and appreciate all of your efforts in providing info. and seeking public comment. We have had a few inquiries come in asking which option allows for the most underground. At first glance, it looks like Variant A2 and Variant C1 have the underground, but I'm not sure which has more. I've been navigating around your site, however if you could send me the direct link to the public comments that are posted, that would be appreciated.	All public comments and their responses were posted on the Project website when responses were finalized and were also included in the Final EIS. Variant C1 would have the longest underground length at 2.7 miles.	Elizabeth Fogarty
Alternative	East	A	Public	I am totally against Alt. Plan A. These lines would go through some rough territory and go over or border houses as it does in our neighborhood. The most reasonable place for them is the OPEN (no homes under the lines) area on the South side of County Road 18. We understand that Estes Park is asking for underground lines in there area. If they came have this so should we be eligible for underground lines if this is the objection from land owners on the Southern existing lines. The Southern route already has the easements in place, there are very few homes on the Southern lines (Plan B) the ugly poles would be a further distance as far as esthetics are concerned. I don't believe they should follow County Rd. 18 E as they again would be to close to homes especially from the last rise on 18E to the dam. I hope that this letter will be read and our wishes are considered. These are really ugly lines and certainly will bring down our property values if they are in our back yards. PLEASE consider using the Southern existing right of ways. I am also sure that this would be the cheapest way to go.	After consideration of many relevant factors, Western has selected Alternative B for this portion of the Agency Preferred Alternative. Alternative A was included for analysis based on comments received from members of the public who supported consideration of this route; due to several issues this alternative was not selected as part of the Agency Preferred Alternative. Please see **Section 2.8** of the Final EIS for a discussion of the rationale used for the selection of the Agency Preferred Alternative.	Norma Dees
Transportation	East		Public	Pole Hill Road Association requests a written agreement with Western Area Power Association that documents WAPA's commitment to: 1) Repair any and all damages to Pole Hill Road Association, Quillan Park Road Association and Saddle North Ranch Road Association roads caused by this project. 2) Meet with the Pole Hill Road Association representative to establish agreement on the scope of repair work prior to bidding this project. Additionally, PHRA requests that potential damage to the road network be addressed in the revised EIS.	Western met with representatives of the Pole Hill Road Association on January 26, 2012 and provided a letter assuring its members that Western would require its contractor to repair any damage to the private portions of the Pole Hill Road as a result of their activity in relation to this project. Repairs would be based on a pre-construction survey of the road condition prior to the contractors use.	Pole Hill Road Assoc.
Special Status and Sensitive Plant Species	All	General	Agency-DOI	US Fish and Wildlife Service Comments: 1. The EIS states that the only T&E species that could occur in the project is the Ute ladies' tresses orchid. USFWS would disagree with this conclusion since the project area is within the range of the Preble's meadow jumping mouse (Zapus hudsonius preblei), which can occur up to 7600' and is known to occur in Larimer County.	Please refer to **Table 3.10-1** and the Biological Report. It was determined that suitable habitat within the known elevation range for the Preble's jumping mouse does not exist within the project area. Further wetland delineations are planned on the Agency Preferred Alternative if potential wetlands could be large enough to be impacted if the transmission line cannot span across them.	Robert F. Stewart
Special Status and Sensitive Plant Species	All	General	Agency-DOI	2. Also, the project area is potentially within the range of the Colorado butterfly plant (Gaura neomexicana var. coloradensis), which can occur up to 6400' and is known to occur in Larimer County.	It was determined that suitable habitat for this species does not exist within the project area. The Biological Report is presented as an appendix to the Final EIS to document all potential species and their occurrences.	Robert F. Stewart
Vegetation		General	Agency-DOI	3. Project actions that result in ground disturbance and removal of vegetation have the potential to result in direct impacts to these species, and potentially in indirect impacts if sedimentation issues result from project actions.	It was determined that suitable habitat for these species does not exist within the project area. Western would conduct pre-construction surveys for the selected alternative after the EIS process is complete and prior to construction to minimize any effects to T&E or Sensitive Species.	Robert F. Stewart
Special Status and Sensitive Plant Species	East	General	Agency-DOI	4. Additionally, Mexican spotted owl (Strix occidentalis lucida) is known to occur in mixed conifer areas along the Front Range of Colorado. If a new route was selected that crossed areas of dense mixed conifer stands in narrow rocky canyons, there is the potential that these areas could be occupied by the Mexican spotted owl and therefore, could impact that species.	All routes analyzed for the project have been evaluated for impacts to all special status species with the potential to occur within or adjacent to the project area. Currently, no suitable habitat exists for the MSO within the project area and along the Agency Preffered Alternative.	Robert F. Stewart

	Section of Route	Alternative	Public or Agency	Comment	Response	Author
Special Status and Sensitive Plant Species		General	Agency-DOI	5. We would expect the EIS to include a more thorough analysis of the potential for these species to occur in the project area, and to provide an analysis of the anticipated impacts.	The Final EIS includes the Biological Report as an appendix since it is referenced in both the Special Status Species plant and wildlife sections. **Section 3.10.1** has been updated with the text: "The assessments contained within the BR are based upon information obtained from several sources: (1) published literature, (2) unpublished agency reports and data, (3) Colorado Natural Heritage Program (CNHP) database search, and (4) field surveys. The CNHP database search for threatened, endangered, and proposed species was requested for a 1-mile corridor on each side of all ROWs. Results of the CNHP database search request were received on November 18, 2011. A more detailed request was submitted for the National Forest parcels crossed. The specifics of the request for National Forest land and the results of this request are provided in the Biological Report submitted to the ARNF for the National Forest portions of the project area."	Robert F. Stewart
Alternative	All	C/C1	Agency-DOI	National Park Service Comments: 1. NPS favors Alternative C, Variant C1 for the reason that the western 2.7 miles of the transmission line would be constructed underground and therefore less visible.	Please see **Section 2.8** of the Final EIS for a discussion of the rationale for the selection of the Agency Preferred Alternative. For the reasons given there, an underground option was not selected for the Agency Preferred Alternative. Because of the need to maintain a shrub-free 50-foot-wide zone over buried lines, an underground line may not be less visible than an overhead line from the Park; the cleared ROW has more visual influence than do the presence of structures at that distance. Please see **Appendix C** in the Final EIS for comparisons of visual simulations from the Park.	Robert F. Stewart
Visual	West		Agency-DOI	2. Section 4.12.1 states that, " . . .though individual transmission facilities can be seen by the unaided eye at miles from the project (outer extent of the middle ground distance zone) where not screened. Beyond 4 miles, individual facilities are generally difficult to discern. Landscape changes, such as ROW maintenance, may be discernible up to 12 miles away during optimal viewing conditions." We concur with this statement and it is relevant to the following comment.	Thank you for your comment.	Robert F. Stewart
Visual	West		Agency-DOI	3. Figure 3.12-1 depicts the Visual Resources Analysis Area and shows the middle ground extending up to 4 miles from the transmission line. Yet, the potential visibility within the project area is described in Section 3.12.2.2 as, "where potential structures averaging heights of 105 feet would be visible by a 6-foot tall viewer from highways, residences, and recreation areas within 1 mile of the project." We request that the "seen area" mapping for sensitive viewers include the entire middle ground specifically where it encompasses portions of Rocky Mountain National Park (i.e., extending up to 4 miles from the transmission line).	Thank you for your comment. We agree that the area of analysis should include the area within four miles, because structures and the ROW clearing would be apparent to sensitive viewers at that distance. Four miles is a standard distance for NEPA studies and USFS consistency analysis. This comment was addressed with additional "seen area" mapping. See **Section 3.12.2** of the Final EIS.	Robert F. Stewart
Visual	All	General	Agency-DOI	4. In our opinion the viewshed analysis did not use the same criteria throughout so in essence the analysis is comparing apples to oranges. The transmission line visibility criteria for the existing transmission line viewshed, Alternative A, Variant A1, Alternative B, Alternative C, and Alternative D show "High" visibility as "up to 7 miles of transmission line visible." The visibility criteria for Variant A2 and Variant C1 show "High" visibility as "more than 2 miles of transmission line visible." Please use consistent criteria and the same analysis area boundaries for the visual resource analysis so we can compare apples to apples.	The visibility criteria have been adjusted for consistency. **Section 4.12** in the Final EIS describes the visibility criteria.	Robert F. Stewart
Alternative	All	General	Agency-DOI	5. We support the adoption of Section 4.12.6 mitigation including VR-1, which states that "Rocks, brush, and woody debris will be salvaged and replaced to approximate pre-project visual conditions on graded structure pads, staging areas, and temporary access routes that are decommissioned post-construction, to re-establish the pre-disturbance surface character and aid in revegetation." "Implementation of VR-1, if adopted, would re-establish the pre-disturbance surface character following construction and accelerate long-term reclamation of graded pads, staging areas, and temporary access routes."	Thank you for your comment.	Robert F. Stewart
Visual	All	General	Agency-DOI	6. NPS supports the adoption of VR-2, which states that "Western will utilize non-specular conductors and non-reflective coatings on insulators." "Implementation of VR-2, if adopted, would reduce glare from transmission conductors and insulators."	Thank you for your comment. Western considered using self-weathering steel for its structures where appropriate. It was thought that in wooded areas, if used, this material would provide a protective barrier against the elements while also blending better aesthetically to the physical surroundings. However, the latest field experience information from the utility industry on self-weathering structures indicates that ongoing corrosion weakens these structures, therefore shortening their expected service life. For this reason, and the fact the Forest Service prefers dull galvanized steel, self-weathering steel structures would not be used for this project.	Robert F. Stewart
Visual	West	General	Agency-DOI	7. We support the adoption of VR-3, which states that "A rust-colored, weathered finish would be applied to transmission structures from Bald Mountain west to Estes Park." "Implementation of VR-3, if adopted, would reduce color contrasts and glare from transmission structures."	Western considered the use of both self-weathering and galvanized steel structures, depending on which would be more visually unobtrusive. However, the latest field experience information from the utility industry on self-weathering structures indicates that ongoing corrosion weakens these structures, therefore shortening their expected service life. For this reason, and the fact the Forest Service prefers dull galvanized steel, self-weathering steel structures would not be used for this project.	Robert F. Stewart

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Visual		General	Agency-DOI	8. During construction of the transmission lines and for vegetation management thereafter we request that to the maximum extent possible feathered tree lines be employed as opposed to straight tree lines. Transmission line clearings, and especially unnaturally straight clearings, can be highly visible on the landscape from many miles away. Feathered tree line clearings for the transmission line will help to reduce the adverse visual impact on Rocky Mountain National Park.	Western agrees that the feathering of ROW edges can result in a more natural appearance. However, feathering results in a wider cleared area, which may draw additional attention to the ROW. Western must point out that ROWs are cleared to NERC standards, and ROW width is partially determined by those standards. Therefore, feathering would have to occur outside of the ROW, and would result in more clearing on landowners' properties and a wider cleared area, since feathering cannot be accomplished by allowing more vegetation in the ROW. The ROW would already be managed to allow shrubs and low-growing trees to the extent compatible with fire management, maintenance access, and other considerations. Most landowners favor minimal impact on their properties, and Western has limited rights to clear vegetation (danger trees only) outside the ROW boundaries. These factors make feathering difficult to implement.	Robert F. Stewart
Proposed Project	All	General	Agency-DOI	Bureau of Reclamation Comments: All costs, direct or indirect, associated with the project that result from moving or replacing the SCADA fiber carried by the existing poles and which Reclamation jointly uses with WAPA and others should be considered a project cost of the ESTES TO FLATIRON TRANSMISSION LINES REBUILD PROJECT.	Bureau of Reclamation would not incur any costs as this is a Western Area Power Administration project.	Robert F. Stewart
General		General	Agency-Town of Estes	The Town of Estes Park strongly encourages and requests the Department of Energy consider alternatives to mitigate the following potential negative of the Estes-Flatiron Rebuild Project to the greater Estes Valley: 1) Impacts of transmission lines and towers and their effect on property owners near the right-of-way; and 2) Impacts of the transmission lines and towers on the rural character, majestic views, and the overall natural beauty of the area; and 3) Impacts to the local economy in the Estes Valley that emphasizes natural attractions for lodging, retail and recreational activities; and 4) Impacts of the transmission lnies and towers to the Estes Valley view sheds, corridors and aesthetic values that support a successful Estes Valley economic tourism base; and 5) Impacts of not undergrounding transmission lines which may leave above ground transmission lines and towers vulnerable to terrorist threats; may result in tower failure and potential wildfire issues to an area already dealing with the impact of bark beetle infestation; and potential environmental damage from lightning and arcing of transmission lines; and Consider the negative impacts of the proposed project's encroachment into the greater Estes Valley Planning Area; and Consider the impacts of the proposed project to an Estes Valley landmark located on U.S. Highway 36 known as the "Estes Park" welcome sign where visitors routinely photograph their arrival to Estes Park; and Consider undergrounding transmission lines now and in the future, specifically transmission lines and towers along the U.S. Highway 36 causeway when such projects are presented.	The issues cited by the Town of Estes Park have all been addressed in both the Draft and Final EISs. Potential socioeconomic impacts of the transmission towers on property owners and the local economy are detailed in **Sections 4.13.2.2** and **4.13.5**. Further analysis regarding the visual impact of the proposed project on the viewshed and overall rural character is found in **Section 4.12** with project simulations portrayed in Appendix C. Potential terrorist and fire impacts from the use of aboveground structures can be found in **Section 4.17**. Western must point out, however, that the two existing lines on maintained ROWs have been part of the landscape for 60+ years, and can hardly be considered a new 'encroachment'. Western's Agency Preferred Alternative would remove one existing line and abandon the existing ROW. This would allow the abandoned ROW to disappear from the visual landscape over time. This positive visual and property owner benefit needs to be recognized as an offset to the proposed taller structures. The new steel structures would be more impervious to wildfires than the existing wood poles, and because the new line would be more resistant to wind and other damage, any potential source of ignition would be minimized compared with the old lines. The Agency Preferred Alternative ensures that the new line would not be visible from the 'Welcome to Estes Park' sign, and would relocate the structures currently located adjacent to Highway 36.	Robert F. Stewart
Alternative	All	General	Public	As a biology student currently studying the issues of conservation biology I would like for the Western Area Power Administration (Western) to take path of reconstruction that has the lowest impact on the surrounding environment.I believe the no action alternative, is not feasible for the prolonged use of the power lines between Estes Park and the Flatirons and another alternative is called for.	Thank you for your comment. The fact that the No Action Alternative is not reasonable or feasible is the motiving force behind Western's proposed action to rebuild the existing transmission lines. Determining the environmental impacts of the alternatives to accomplish this goal is an important part of making an informed decision.	James M. Nichols
Alternative	All	B	Public	With consideration and concerns for the environment, while taking into account the overall cost of the proposed project in conjunction with the impact on local views and recreation. Planned Alternative B is the alternative with the best balance of all the issues kept in prospective. While the underground installation in alternative variants A1, A2 and C1 is appealing for the views they would save by going underground in the westernmost 2.7 miles, the cost is prohibitive. Alternative B is not the least expensive but has the smallest impact for the environment and involves the lowest right of way (ROW) acquisition. By following the ROW in use at present the maintenance and installation will leave less disturbance on the land and makes the best environmental sense.	On the eastern end of the project, Alternative B has been selected as part of the Agency Preferred Alternative.	James M. Nichols
Alternative	All	B	Public	To maintain a power line route for the sustainable future following an existing line in the ROW and building the new line with steel supports for prolonged reliability is a sound plan. With all alternatives having some impact on the wildlife, vegetation and recreational use of the area the 42 acres of new ROW is less than half of any other plan. As an avid outdoorsman I enjoy fishing and driving my jeep in and around this area of Larimer County and prefer the smallest amount of new land use provided by alternative B.	On the eastern end of the project, Alternative B has been selected as part of the Agency Preferred Alternative. Western also notes that consolidation of the two existing lines on one ROW allows the removal of the existing line and abandonment of the other ROW, allowing that ROW to revert to nature.	James M. Nichols

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Alternative	All	B	Public	If the original lines were able to withstand 60 to 75 years since being built a new transmission line built to new standards could last well into the future. Along with new construction methods and materials that can withstand the elements for longer use, the improvement of service roads will provide the means to sustain the transmission line for a very long time. With the ROW being widened in all alternatives the integrated vegetation management approach in the ROW is mandatory to maintain the electrical clearance for the life of the proposed project. This minor cost of ROW acquisition is acceptable in the alternative B plan and is an element of all alternatives. With the ROW expansion even included in the No Action Alternative this development of the land doesn't weigh heavily in my opinion.	Thank you for your comment.	James M. Nichols
Alternative	All	B	Public	I do appreciate the observation of animal and bird interference that construction will create and the effort to reduce this disturbance. Knowing that there is inevitable interaction with the local bird and wildlife I hope the seasonal restrictions and the proposed mitigation measures are not only implemented but also adhered to with out exception. With the habitat disturbances expected to be higher in the Alternative B to sensitive wildlife species than most other alternatives any change to improve this statistic would be met with approval.	Thank you for your comment.	James M. Nichols
Alternative	All	B	Public	As the improvement to the current transmission lines is a clearly needed project, I have submitted my analysis on the planned alternative that might have the lowest impact. This is not the only alternative and the other options have good aspects in their write-ups but I feel that Alternative B will have a strong following if the price does not make it undesirable.	Thank you for your comment. Alternative B has been selected as part of the Agency Preferred Alternative on the eastern end of the proposed Project.	James M. Nichols
Alternative	East	B	Public	Many people in our community support Alternative B. The advantages are many: - The south RoW was built in 1953. It is currently sufficiently wide for an open area. No additional easement will need to be acquired for the installation of modern transmission lines. This will avoid the high cost and long time frames of obtaining additional RoWs. -For more than 6 decades landowners have purchased and developed their properties around the south RoW. Land was purchased with the full knowledge and acceptance of the RoWs and structures. -Most existing structures are outside of the 300 foot buffer zone. -In the Pinewood Reservoir area the terrain is open and relatively flat. - Structures (houses, barns, storage buildings) are few and far apart. - Because much of it is ranch land, vegetation along the existing RoW consists of grasses and low shrubs. Where necessary it has already been cleared and is maintained. -There is easy access for installation and maintenance of the transmission lines and structures. There will be no need for additional access roads. Given the longer spans of the new structures, perhaps some of the access roads can be abandoned and returned to their original condition. The open terrain will require a minimum of roads, easing maintenance costs and limiting the damage caused by roads. - WAPA's assumed risk and liability from fire is minimized. Ignition sources from the lines themselves or from other causes will have minimal potential to cause fire compared to other Alternatives. In the unfortunate event of a fire, firefighters have easy year-round access to provide protection to homes and buildings as well as the lines themselves. Due to the general lack of trees, canopy fire dangers are minimized.	Alternative B has been selected as part of the Agency Preferred Alternative on the eastern end of the proposed Project.	Craig Driear
Alternative	East	B1	Public	From Table 2.8-1 of the Estes to Flatiron Transmission Lines Rebuild Project Draft EIS, Alternative B has the following advantages. Please note that these numbers are based on the entirety of the alternative. We have no breakdown for the Pinewood Reservoir area. The No Action Alternative was not included: It requires only 42 acres of new RoW acquisition, compared to 110-177 acres for other alternatives. Only 19 landowners are affected by Row acquisition versus 36-48 with the other alternatives.	Alternative B has been selected as part of the Agency Preferred Alternative on the eastern end of the proposed Project. In order to give the communities at either end of the proposed Project a better means of comparing impacts of alternatives at the local level, new impact summary tables are provided in **Section 2.9** of the Final EIS that focus on those communities.	Craig Driear
Alternative	East	B1	Public	We feel that Alternative B, as currently proposed, is the "least bad" alternative. However, there are two variants that would further improve Alternative B: Variant 1: Where required to ease the visual impact, wooden double circuit H-frames can be used instead of steel monopoles. We ask WAPA to reconsider the use of steel monopoles in favor of wooden double circuit H-frame design for the area around Pinewood Reservoir and Rattlesnake Park. The current visual impact should be improved as the H frames have longer spans resulting in fewer structures.	Double circuit wood-H-frames compromise transmission line reliability and don't meet WAPA's Purpose and Need. Steel monopoles combine long term transmission line reliability with the lowest life cycle cost compared to wood structures. Additionally, visual impact may be reduced based on the longer span length for steel monopoles compared to wood H-frames, roughly 25 percent fewer structures per mile (see **Table 2.2-1**).	Craig Driear
Alternative	East	B2	Public	Variant 2: Bury the lines in the vicinity of Rattlesnake Park and Pinewood Reservoir. In Estes Park the lines are being buried. There is no reason residents in the Pinewood Reservoir area should not have the same option. The land along the south route is open and the soil would allow the easy burial of transmission lines.	The rationale for the selection of the Agency Preferred Alternative is presented in **Section 2.8** of the Final EIS. Underground options were not selected for the reasons provided there.	Craig Driear

	Section of Route	Alternative	Public or Agency	Comment	Response	Author
Alternative	East	A	Public	In the vicinity of Green Mountain, this alternative has unique challenges when compared to B, C and D. -The terrain is very rugged, the forest dense, with few improved roads. - Approximately 11h miles of new RoWs will need to be acquired, an expensive and time consuming process. There exists the potential for litigation from resistant landowners. A simpler solution is to use the existing Rows. -If acquired, the new RoWs will need to be cleared and all of the wood and slash removed. Over such extreme terrain this is a difficult, dangerous and expensive proposition. The steep, newly cleared land will be subject to erosion from snow melt & rain. - Access roads to each new structure will be cut, of sufficient width to accommodate the large vehicles required to install the structures. The steep roads, now devoid of vegetation, will be expensive to maintain and open to severe erosion throughout the year. -Wildlife -- one of the major attractions of the area --will be adversely affected. - With the existing significant loss of trees from Pine Beetles and wildfires, we find it difficult to understand how the destruction of even more forest can be justified - especially when cleared RoWs are already available. - During the winter much of the transmission lines would be inaccessible for repair and maintenance. Fires are more likely to occur in the alternative A area, and would more difficult to fight, than with the other alternatives (especially B). In this already fire-prone area, transmission lines could further increase the risk. - As viewed on a map, the transmission lines cross very close to, if not directly over several homes. WAPA's assumed liability from fire losses would be greater than with the other alternatives (especially B).	Although Alternative A was added to the NEPA analysis at the request of members of the public, for several of the reasons raised by the commenter, and others, Alternative A was not selected for inclusion in the Agency Preferred Alternative in this area; Alternative B was selected. Western evaluated this option and determined that the route had a number of issues, including access, steep terrain, and general constructability. As a result of public input on the Draft EIS, summary tables of impacts have been added to the Final EIS **Section 2.9** that specifically assess impacts of the alternatives at each end of the line. This reorganizing of the data summary in Chapter 2 provides a better means of comparing and contrasting alternatives at the local level. Potential health effects are discussed in **Section 4.14** of the Final EIS, and property valuation issues are covered in **Section 4.13.5**.	Craig Driear
Alternative	East	A	Public	- Possible health effects from transmission lines have not been ruled out; the evidence is still inconclusive. We therefore feel that safety is best served by locating transmission as far as possible from people's homes, which can best be accomplished by Alternative B. - Along the Green Mountain deviation, properties would have a compromised viewshed and possible health factor, not foreseen when purchased. Plans to develop and improve the land overlooking or close to the proposed Alternative A route will be affected and may no longer be feasible. - Despite WAPA's conclusions (Estes-to-Flatiron Transmission Line Rebuild Project Draft EIS, section 4.13.3.2) "Most studies found no effect to [long term] property values ... " there will be a severe downward effect on the value of any property newly traversed by transmission lines. However, in section 4.13.5 they claim " ... estimates of the decrease in property values range from 2 to 9 percent." We are in the process of obtaining a statement of property devaluation. Preliminary estimates show a loss significantly more than their estimate, of at least 50 percent. -Table 2.8-1 of the Draft EIS show only 8 favorable outcomes to Alternative A, compared to a high of 19 for Alternative B. There is no breakdown of the effects by area - these are for the entire length of the Alternative A/A1/A2 plans. Negative outcomes include: -The most acres of New RoW acquisition (153/157/152 respectively) - The most landowners affected (46/48/42) - Except for the dual RoWs of Alternative D, the most RoW erodible acres (82/76/63)	Although Alternative A was added to the NEPA analysis at the request of members of the public, for several of the reasons raised by the commenter, and others, Alternative A was not selected for inclusion in the Agency Preferred Alternative in this area; Alternative B was selected. Western evaluated this option and determined that the route had a number of issues, including access, steep terrain, and general constructability. As a result of public input on the Draft EIS, summary tables of impacts have been added to the Final EIS **Section 2.9** that specifically assess impacts of the alternatives at each end of the line. This reorganizing of the data summary in Chapter 2 provides a better means of comparing and contrasting alternatives at the local level. Potential health effects are discussed in **Section 4.14** of the Final EIS, and property valuation issues are covered in **Section 4.13.5**.	
Alternative	All	A	Public	In today's Open House we were informed that Alternative A has been re-routed to follow Cottonwood Creek, passing through the area burned in the 2010 Reservoir Road Fire. The same argument applies to the Green Mountain area for any variant of Alternative A. For these reasons, and many of the same reasons stated in the previous presentation, we feel that Alternative B is still preferable.	Alternative A, requested for consideration by members of the public, was found to have a number of issues, and was not selected as part of the Agency Preferred Alternative. Alternative B was selected on the eastern end of the project for the Agency Preferred Alternative.	Craig Driear
Socioeconomics	East	A	Public	The proponents of Alternative A (hereafter referred to as "proponents") are those seeking the removal of the ROWs from their property. Proponents are also those seeking to remove the poles and lines from their scenic view across private and public lands. If the proponents are successful, a new and innocent group of landowners -- those along the proposed Alternative A route - would be burdened with new easements on their land. They would bear the cost in the form of new ROWs, and they would suffer from the diminished scenic value of their property. This amounts to an illegitimate transfer of property restrictions from one group of landowners to another.	As the commenter notes, Alternative A was identified by members of the public for analysis in the EIS. Western evaluated this option and determined that the route had a number of issues, including access, steep terrain, and general constructability. Alternative A was not included in the Agency Preferred Alternative.	Jeff Barina

	Section of Route	Alternative	Public or Agency	Comment	Response	Author
Socioeconomics	East	A	Public	The key issue is that the north and south ROWs have existed for decades. And most, if not all, of the proponents in the Pinewood area purchased their properties willingly and with full knowledge that their land was subject to these ROWs. Conversely, those along the route -- and not in favor of Alternative A -- had no such knowledge. They purchased property that was not subject to these easements.	Thank you for your comment. Alternative A is not part of the Agency Preferred Alternative.	Jeff Barina
Socioeconomics	East	A	Public	In essence then, this is a case wherein one group of landowners would transfer property restrictions to another. That first group stands to gain with increased land values at the expense of the second group, whose property will be devalued.	Thank you for your comment. Potential effect to property values are discussed in **Section 4.13** of the Final EIS, and are expected to be minor.	Jeff Barina
Alternative	East	B	Public	The solution is Alternative B: -- Alternative B uses the south ROW, a long-established easement familiar to and accepted by the landowners in the area. -- It successfully removes the north ROW from the property of most proponents and increases land values. -- It does not transfer property restrictions to a new, innocent set of landowners. The remaining issue of protecting scenic views is important, but it should not be paid for on the backs of other, innocent, private landowners - those landowners who are not even adjacent to the open space.	Alternative B has been selected as part of the Agency Preferred Alternative.	Jeff Barina
Visual	East	B	Public	Instead, the cost for protecting scenic views through public lands -which is a public benefit -- should be paid for by the public. One suggestion is to use the double-circuit wooden H-frame structures to minimize the visual impact to the scenic view. This is less expensive and much preferred to the steel monopoles. Another suggestion is using public funds, perhaps through park fees, Great Outdoors Colorado (GOCO) grants or other means, to help fund underground construction through the public open space areas.	The retention of wooden H-frame poles is detailed in Alternative D, which would rebuild both transmission lines 'in-kind'. The commenter's suggestion is not a viable option as a result of the short ruling span, fire risk, increased visual impact, and increased maintenance of the double-circuit 115-kV wood-pole H-frame structures. This alternative is also one of the more costly, as detailed in **Section 2.4**, would require maintenance of two ROWs, and be more susceptible to wildfires due to the use of wooden structures. Visually, the removal of one existing line and abandonment of one ROW needs to be compared against construction of one taller double-circuit line on a single ROW. Partial public funding is complicated by regulations governing Western's acceptance of funds from the public; legislation would likely be required to do this. Lacking public or appropriated funding from Congress, electrical power rates (either Western's wholesale power rates or participating utilities retail consumer rates) would pay for the proposed Project.	Jeff Barina
Alternative	East	B	Public	There are two existing power transmission lines in service near the Flatiron substation and Pinewood Reservoir. One line runs roughly on the north side of County Road 18E, and is referred as the "north" line. The second line runs roughly on the south side of the same road and is referred as the "south" line. These two transmission lines run along rights-of-way (ROWs) that have been established and used in their present location for decades, since the 1930's and 1950's. They should be reused for the transmission line rebuild to the greatest extent. Utilization of existing ROWs is beneficial for a variety of reasons, among them: - It is more efficient and allows faster progress for the rebuild effort; - Cost is typically much less than acquiring new ROWs; - Potential litigation and other delays from newly affected landowners is minimized.	Western agrees with the commenter that existing ROWs should be reutilized whenever practicable. However, transmission line upgrades also provide the opportunity to relocate sections of line to avoid encroachments, avoid sensitive resources, relieve identified impacts (e.g., erosion areas) , accommodate planned development, and otherwise respond to the situation as it presently exists.	Jeff Barina
Socioeconomics	East	A	Public	Arguments Against Alternative A: 2. Alternative A seeks to deviate from the existing, long-established ROWs. Property owners over the years have purchased land, planned, built homes/structures and otherwise developed their land based on these longtime established ROWs. Abandoning these ROWs and now imposing new easements causes severe, undue and unnecessary harm on a new set of landowners.	Members of the public at the routing workshops hosted by Western identified Alternative A as an option they wanted Western to analyze. Western did so, and found a number of issues with access, steep slopes, and constructability, among others. Alternative A was not selected to be a part of the Agency Preferred Alternative. Alternative B on the east end of the proposed Project has been included as part of the Agency Preferred Alternative.	Jeff Barina
Alternative	East	A	Public	Acquiring new ROWs along Alternative A is more costly and timeconsuming than using the existing ROWs of the "north" and "south" lines, resulting in slower and more expensive progress. Per WAPA, PVREA customers will bear these costs as higher electric bills.	Members of the public at the routing workshops hosted by Western identified Alternative A as an option they wanted Western to analyze. Western did so, and found a number of issues with access, steep slopes, and constructability, among others. Alternative A was not selected to be a part of the Agency Preferred Alternative. Alternative B on the east end of the proposed Project has been included as part of the Agency Preferred Alternative.	Jeff Barina
Transportation	East	A	Public	Alternative A would traverse extremely steep terrain. The steep terrain would make ROWs and access roads difficult to create, expensive to maintain, and subject to severe erosion. Snow cover on the steeper sections of these roads would make navigation of maintenance vehicles difficult or impossible. Transmission line maintenance would likely have to be excluded during winter months. More troubling is that essential or emergency repairs during winter months may be especially hampered by the steep, snow-covered access roads.	Alternative A was included in the Draft EIS at the request of members of the public. Western agrees that the concerns raised by the commenter are valid. Accordingly, Alternative A was not included in the Agency Preferred Alternative.	Jeff Barina
Accidents	East	A	Public	Alternative A would pass through thickly forested areas. Sources of ignition - from maintenance activities or the transmission lines themselves - could easily ignite a tinder-dry forested area.	Western would continue to utilize long-established safety practices during construction, operation, and maintenance of any alternative to ensure adequate protection against fire hazards. The new steel poles, coupled with new conductors and more modern design standards would also enhance fire safety. Information on fire management is located in **Section 4.7.3.3** Fuels and Fire Management. In any case, Alternative A has not been selected for inclusion in the Agency Preferred Alternative.	Jeff Barina

	Section of Route	Alternative	Public or Agency	Comment	Response	Author
Accidents	East	A	Public	There are many residences within tens of feet of Alternative A's routing. Even more residences and structures are within a quarter-mile of the proposed routing. The resulting liability from fire losses could be very significant. This liability would be compounded by WAPA's decision to deliberately and knowingly favor Alternative A, while a less fire-prone, less steep, less inhabited and more accessible option exists, such as the "south" ROW.	The route mapped for Alternative A was conceptual in nature and did not represent a centerline or final route. Western would employ a 110-foot ROW that would maintain an adequate and safe set-back between the transmission line and residences on all alternatives. Western would continue to utilize long-established safety practices during construction, operation, and maintenance to ensure adequate protection against fire hazards. The new steel poles, coupled with new conductors and more modern design standards would also enhance fire safety. More information on fire management is located in **Section 4.7.3.3** Fuels and Fire Management. Alternative A was not been selected for inclusion in the Agency Preferred Alternative.	Jeff Barina
Accidents	East	A	Public	Let me cite just one example: I'm sure you are aware that in 2011, there was a devastating fire in New Mexico. It was called the Las Conchas fire, one of the largest, most destructive fires in that state's history. The liability and those responsible for the damages are still being fought in court. The US Forest Service is billing the local electric cooperative (Jemez Mountains Electric Cooperative) for $38 million dollars in firefighting costs and damages. Homeowners and insurance companies are also litigating. The coop is claiming the Forest Service is liable. It is a protracted mess. The fire was started by a downed power line from a falling tree during high winds. We have the exact same conditions here in Colorado: --Thick forests with tall trees -- Very high winds -- tinder-dry conditions Why would we perpetuate the same disastrous mistake here in Colorado? Alternative A would do exactly that -- by running a new power transmission line through tall trees, in steep terrain, in a wind-prone area, that is extremely dry. The only difference this time? The fire would be known as the "WAPA Alternative A fire". A less liable, much safer, and smarter alternative exists with Alternative B.	Western would employ a 110 foot ROW that would maintain an adequate and safe set-back between the transmission line and residences. Western would continue to utilize long-established safety practices during construction, operation, and maintenance to ensure adequate protection against fire hazards. The new steel poles, coupled with new conductors and more modern design standards would also enhance fire safety. More information on fire management is located in **Section 4.7.3.3** Fuels and Fire Management. Western would also follow NESC vegetation management standards to ensure encroaching vegetation would not cause arcing and a potential ignition source. It should be pointed out that clearing to current NESC standards may increase visual impacts, just one of the unavoidable tradeoffs Western must consider. Alternative A was not included in the Agency Preferred Alternative.	Jeff Barina
Alternative	East	B	Public	Arguments For Alternative B (with two options): Alternative B is the preferred choice for the transmission line rebuild near the Flatiron - Pinewood Reservoir area. It re-uses the existing "south" ROW that has been in service for decades. Over the years, stakeholders have purchased land and developed their properties based on the location of this ROW.	Alternative B was selected as part of the Agency Preferred Alternative.	Jeff Barina
Alternative	East	B	Public	Alternative B uses the "south" ROW near the Flatiron substation, which already has adequate width to meet current standards. Costs are minimized since the acquisition of additional ROWs is not necessary.	Alternative B was selected as part of the Agency Preferred Alternative.	Jeff Barina
Alternative	East	B	Public	Table S4, "Measurement Indicators for Key and Other Issues", outlined in the draft Environmental Impact Statement (EIS), consistently shows Alternative B to have the smallest adverse impact on stakeholders. For example: Alternative B affects the fewest landowners (19 vs. 36-48); and fewest acres of new ROW acquisition (42 vs. 110-177). Alternative B also has the highest positive effect for the number of landowners with ROWs to be decommissioned (51 vs. 7-36). Totaling all line items in Table S4, Alternative B has 19 favorable outcomes. The nearest competitor is Alternative Cl at 11 favorable outcomes, while the undesirable Alternative A has only 8 favorable outcomes. Alternative Bis clearly the best choice, according to Table S4.	Alternative B was selected as part of the Agency Preferred Alternative.	Jeff Barina
Alternative	East	B	Public	Alternative B benefits the many landowners in the Newell Lake subdivision by decommissioning the transmission lines through the subdivision and along County Rd 18E.	Relocation of the existing transmission line through the Newell Lake subdivision was part of all action alternatives due to existing encroachments and safety concerns. Alternative B was selected as part of the Agency Preferred Alternative. However, one pole of each existing structure through the Newell Lake Subdivision would be left in place with the fiber optic ground wire in order to maintain a communications link with the Bureau of Reclamation operated dam.	Jeff Barina
Accidents	East	B	Public	WAPA's assumed risk and liability from fire hazard is minimized with the choice of Alternative B. The "south" ROW between the Flatiron substation and Pinewood reservoir is not in a forested area, has fewer at-risk structures and consists mostly of grasses and low-growing shrubs. Ignition sources are less likely to cause a wildfire outbreak, and tree canopy fires could not form. The proximity of County Road 18E provides easy access for firefighting ground equipment, and easy access to the transmission line. This choice compares very favorably to other alternatives that are routed through steep, inaccessible terrain with forested landscapes.	Alternative B was selected as part of the Agency Preferred Alternative.	Jeff Barina

	Section of Route	Alternative	Public or Agency	Comment	Response	Author
Proposed Project	East	B	Public	An Option: Alternative B passes by the south end of Pinewood Reservoir, through an area some refer to as "Rattlesnake Park". The visual impact from Alternative B can be reduced with the use of wooden H-frame structures that can support a double circuit, contrary to what is stated in the draft EIS, page 2-41: 2.7.2 Alternative Structure Types In addition to routing options, alternative project designs were considered and presented during the public workshops held in October 2012. Other structure types considered included a lattice structure and double-circuit H-frame. Neither the lattice nor double-circuit H-frame designs were supported by public comments, and were not carried forward for further analysis. The wooden double-circuit H-frame designs would be far less objectionable than the steel monopoles. We would like WAPA to reconsider in favor of the wooden double-circuit H-frame designs.	Double circuit wood-H-frames compromise transmission line reliability and don't meet WAPA's Purpose and Need. Steel monopoles combine long term transmission line reliability with the lowest life cycle cost compared to wood structures. Additionally, visual impact may be reduced based on the longer span length for steel monopoles compared to wood H-frames, roughly 25 percent fewer structures per mile (see **Table 2.2-1**).	Jeff Barina
Proposed Project	East	B	Public	A Second Option: Add a Variant to Alternative B that includes underground burial of the transmission line through Pinewood Reservoir County Park, also known as "Rattlesnake Park". This is analogous to the Variant Cl, in which the westernmost 2.7 mile section near Lake Estes is constructed underground. Stakeholders on the eastern end should receive equivalent consideration for this option as are stakeholders on the western end.	A discussion of the rationale for not considering underground construction is found in **Section 2.8** of the Final EIS.	Jeff Barina
Land Use and Recreation	All	D,C	Public	In talking with Western Power representatives, we have discovered that if the new structures described in the EIS under Alternative D, and possibly Alternative C, are put in place, we could lose most of the land on which the schoolhouse sits, due to the size of the right-of-way needed, especially if the structure is a turning pole, which requires an even larger footprint.	Alternative B was selected for inclusion in the Agency Preferred Alternative, rendering this concern moot.	Gib Coalwell
Land Use and Recreation	East	General	Public	As required, Western Power looked into the impact of its proposals on historical structures in the area, but we do not believe the agency did its due diligence. To begin with, the EIS contains inaccurate information. On page 1-5 of the EIS, Western Power states: *It should be noted that both of the existing transmission line ROWs were in place prior to these neighborhood developments; the homes were built with the existing transmission lines in place.* That information is incorrect. The schoolhouse was in place long before the right-of-way were procured, and the transmission lines were put into place. The current North line, which runs approximately 300 feet north of the schoolhouse, was constructed 28 years after the schoolhouse was built.	Text has been revised to state that most but not all of the existing development occurred after the transmission lines were constructed.	Gib Coalwell
Cultural	East	General	Public	Furthermore, the agency looked at the schoolhouse not once, but twice, but could not rule out its historical significance (see page 3- 124 for details). While labeling several sites as "determined not eligible" for the National Register of Historic Places, the EIS states the schoolhouse is "recommended" as not eligible, most likely due to the agency's finding that no National Register of Historic Places assessment has been found. We're now in the process of changing that. After seeing that Western Power could not definitively say the schoolhouse was not eligible for National Register of Historic Places status, we looked into the matter, and found that the building should easily qualify under the "Rural School Buildings in Colorado" designation, which is part of the "Multiple Property Listing" types, defined as a series of individual and/or district listings of thematically-related historic properties. ...we are currently in the process of submitting the Pinewood Schoolhouse to be listed in the National Register of Historic Places, and the Colorado State Register of Historic Properties.	As detailed in the Addendum report, Western made the determination that the schoolhouse is not eligible and the Colorado State Historic Preservation Office (SHPO) concurred. This determination is based on modifications to the original structure over the years that has resulted in the schoolhouse no longer retaining sufficient historic integrity, as defined in 36 CFR 60, to be included in National Register of Historic Places. Since the Colorado SHPO has determined that the schoolhouse is not eligible, it is also not eligible for the Colorado State Register of Historic Properties. Western is aware of the owners' plans to restore the Pinewood Schoolhouse, and does not dispute that the property has historical interest. Alternative B was selected as part of the Agency Preferred Alternative in this area, so the Project would not affect the schoolhouse.	Gib Coalwell
Cultural	East	General	Public	We would like to point out that in the EIS, Western Power does refer to historical significance as a reason to avoid placing lines. On page S-12 of the EIS summary, you can read about how an alternative route that would have run along the Flatiron Penstocks was dropped, in part, because "the penstocks are iconic facilities that date to the 1940s and have historic significance." With all due respect to those silver pipes, we believe the 1910 schoolhouse has much more iconic appeal and historic significance.	The structural modifications to the Pinewood School have resulted in diminished integrity as defined in 36 CFR 60 National Register of Historic Places. The Colorado SHPO concurred that the property was not eligible for inclusion on either the Federal or State Register of Historic Places. Furthermore, while the historical significance of the penstocks was considered, additional rationale for not moving forward with additional analysis was the lack of opportunities for visual concealment provided by the surrounding terrain. Both of these rationale provided the justification for dismissing this alternative from further analysis. Alternative B has been made part of the Agency Preferred Alternative in this area.	Gib Coalwell
Cultural	East	General	Public	In addition, we have found no mention of the penstocks as being eligible for the National Register of Historic Places, so why did Western Power describe them as having "historic significance," and use that criteria as a means to drop a proposed alternative route, when it did not give that same consideration to the schoolhouse?	The fact that Alternatives C and D were fully analyzed does not mean that the Pinewood Schoolhouse was ignored. Indeed, it was one of the factors that lead to Alternative B being selected for inclusion in the Agency Preferred Alternative. The penstocks and associated facilities are not listed in the NRHP register (See **Tables 3.15-1** and **3.15-2**). There were other factors considered in dismissing the alternative near the Flatiron Penstocks from further analysis.	Gib Coalwell

	Section of Route	Alternative	Public or Agency	Comment	Response	Author
Cultural	All	C,D	Public	To further solidify the argument against Alternatives C and D, on page 4-146, the EIS states that both alternatives have a greater number of historic properties encountered than the other proposed options. Alternative C would affect nine historic sites, while Alternative D would affect 12 such sites. So, we respectfully ask that Western Power consider dropping both Alternatives C and D.	All potential alternatives have impacts, and only those that are clearly not reasonable or feasible, do not meet the purpose and need for action, or have unacceptable levels of impact even at the conceptual level are eliminated from full analysis. Others that do meet these criteria are fully analyzed in order to develop the pros and cons needed to make an informed decision; they are not 'dropped'. However, they may not be selected because of the cons, and in this case Western has selected Alternative B as part of its Agency Preferred Alternative in the vicinity of the Pinewood Schoolhouse.	Gib Coalwell
Alternative	East	A	Public	In closing, we wish to add that while we strongly oppose alternatives C and D, we believe that Alternative A on the east side of the project (Pinewood Reservoir area) is equally unfeasible, as backed by arguments you will hear from our neighbors in that area. Alternative B, where the power lines and 100-foot right-of-ways already exist, seems to be the most feasible and logical choice.	Western has selected Alternative B in this area as part of its Agency Preferred Alternative.	Gib Coalwell
Alternative	All	A	Public	Alternative A: This Alternative is the most destructive. This alternative was not presented at the last meeting for the development of the DOE/EIS Draft, therefore I was surprised, even blindsided to see it listed.	Alternative A was evaluated in direct response to public requests at the public routing workshop. It was not selected as part of the Agency Preferred Alternative.	Dennis Schump and Sharon Meyer
Alternative	East	A	Public	With Alternate "A" on the east side of the Newel subdivision, it would place a new pole row in a pristine, rugged area that was not involved in the Reservoir Road Fire. There are steep hills and a deep valley through the proposed route. The area is heavily forested with Douglas fir and Ponderosa pine; many of the trees are hundreds of year old. Two easements are currently being used: they have been used over 60 years; there is no need or an excuse for a new row.	Alternative A was evaluated in direct response to public requests at the public routing workshop. It was not selected as part of the Agency Preferred Alternative.	Dennis Schump and Sharon Meyer
Electrical	East	A	Public	If Alternative "A" were approved a corner pole would be placed on my property; a massive 8' round 110 foot pole near pole 14.1 would be easily seen from Loveland. The original power poles were arranged in an East - West direction; looking west of Loveland the poles are somewhat behind each other minimizing damage to the view. The section of Alterative "A" east of the Newel subdivision would run North - South, making it look like a row of radio Antenna's on top of Green Mountain. Radio frequency interference from the power lines would be located only 350-375' from our home. I am very concerned about possible interference from the power lines to my CRT-D heart pacemaker, also knowing that the power lines would be directly overhead if I walk in many areas of my property	Exact pole locations have not been determined at this time. **Section 4.12** details visual impacts by alternative and visual impact mitigation measures. As detailed in **Section 4.14.3.5**, the maximum induced electrical field of any of the proposed alternatives is estimated at 0.5 kV/m, well below the estimated interference threshold of 3.4-kV/M. Therefore, with operation at 115 kV, the proposed project would not pose a risk to pacemakers. In any case, Alternative A was not selected to be part of the Agency Preferred Alternative.	Dennis Schump and Sharon Meyer
Electrical	East	A	Public	We are concerned about power line interference with cell phones, cardiac heart monitoring and internet service: We currently have good but minimal 4G reception from Sprint. The RFI from the 115KV power lines may reduce the signal to noise ratio enough to prevent reliable reception. Skybeam internet reception may also be impaired since we have a straight shot to the Skybeam tower in Loveland; the new power lines would be directly in between the Skybeam transmitter and our home. Also I have radio operated heart monitor that could be impaired.	EMF from modern transmission lines is at a very low 60 hertz, far lower than the 800-2,500 megahertz ultra-high frequency ranges used by cell phones. EMF at 60 hertz do not cause cell phone or landline interference. In fact, cell phone transmitter/receiver equipment found on typical cell towers is routinely mounted to transmission line structures in developed areas where space is limited. For similar reasons the transmission line would not affect radio or TV frequencies. In isolated instances loose or damaged conductors or hardware can cause arcing, which can result in broadband interference at close distances. Once reported these issues are easily resolved.	Dennis Schump and Sharon Meyer
Socioeconomics	East	A	Public	The area is composed of 35 acre lots that were historically designated as view lots known as Pinewood Mountain Estates. Homes in this area have been built to enjoy the natural beauty and views of the area at significant expense, if Alternative "A" is chosen; I would expect significant depreciation of our property and nearby properties.	Potential effect to property values are discussed in **Section 4.13** of the Final EIS, and are expected to be minor. In any case, Alternative A was not selected to be part of the Agency Preferred Alternative.	Dennis Schump and Sharon Meyer
Alternative	East	A	Public	If Alternative "A" must be used "worst case scenario", please look at this minor proposed easement change for Alternative "A"; rather than using pole 14.1, use pole 13.5. Run the line north from pole 13.5 and then draw a line east from pole 12.3 using an intersecting line. While this point would be a 90 degree turn, adding a couple poles would soften the transition that might make this idea more feasible. This change would minimize the environmental impact to the rugged far eastern side of Newell subdivision (Pinewood Mountain Estates), it also creates a fire break for the Newell community. This alternative runs through the reservoir fire on the north side. See attached PDF map file.	Alternative A was not selected to be part of the Agency Preferred Alternative.	Dennis Schump and Sharon Meyer

	Section of Route	Alternative	Public or Agency	Comment	Response	Author
Alternative	All	B	Public	Alternative B: Of all alternatives, I find Alternative "B" the most sensible and least destructive approach to take. From the Flatiron substation past Pinewood Reservoir most of the poles are over grassy meadows with very few trees, under these circumstances the installation should be easier/safer for installation and maintenance. All of 115KW poles would be removed from the Pinewood lake subdivision. Shorter poles could be used over the grass area. A reduction of RFI and potential health concerns would be appreciated. Removal of large power poles from a subdivision should be seen as a positive improvement. The easements for Alternative "B" and poles have been in existence for almost 60 years. We are used to viewing the poles through this easement. I am very disappointed that an underground option for Alternative "B" was not considered through the Rattlesnake (Pinewood lake) area while the Estes Park Variant "A2" was available. Cost should be much less than the Estes Parks variant.	Alternative B was selected as part of the Agency Preferred Alternative. Removal of the portion of the existing line through the subdivision was proposed as part of all the action alternatives due to encroachments and safety concerns. However, one pole of each structure and the fiber optic ground wire would be left in place to maintain communications with the Bureau of Reclamation operated dam. EMF is discussed in **Section 4.14.5.1** of the Final EIS. Please see **Section 2.8** for a discussion of the rationale used in selecting the Agency Preferred Alternative.	Dennis Schump and Sharon Meyer
Alternative, Visual	All	C	Public	Alternative C: Alternative "C" should be discarded as there is no improvement to the neighborhood or views. The final results are many unsightly poles with lots of overhead wire. see no advantage to using Alternate "C". This problem could and should be addressed, (See Alternative "B").	Reasonable and feasible alternatives that meet the agency's purpose and need must be fully analyzed in the EIS. The pros and cons identified for each alternative allows the decision maker to make an informed decision. Alternative B has been selected to be part of the Agency Preferred Alternative.	Dennis Schump and Sharon Meyer
Alternative, Visual	All	D	Public	Alternative D: Alternative"D" should also be discarded as there is no improvement to the neighborhood or views. The final results are many unsightly poles with lots of overhead wire. see no advantage to using Alternate "D". This problem could and should be addressed, (see Alternative "B").	Reasonable and feasible alternatives that meet the agency's purpose and need must be fully analyzed in the EIS. The pros and cons identified for each alternative allows the decision maker to make an informed decision. Alternative B has been selected to be part of the Agency Preferred Alternative.	Dennis Schump and Sharon Meyer
Alternative	All	A2	Public	My choice would be A2 -burying the lines, at least where it impacts views, property and visitors. Future thinking and spreading cost over the lifetime of the projects, makes this the best choice. We are lucky to be surrounded by natural beauty, we are the caretakers for future generations, as well as, all the people who visit and enjoy the beauty and peace of this majestic place.	Underground options would require a 50-foot completely cleared (i.e., no shrubs) ROW which, at a distance, could be more visible than an overhead option. Please see **Section 4.12.5** of the Final EIS for a comparison of visual impacts, and **Section 2.8** for a discussion of the rationale used in selecting the Agency Preferred Alternative.	Susan Johnston
Proposed Project	West	General	Public	Project would cause major impact to Pole Hill Road during the construction phase Project would permanently alter the natural environment along this road (in the subdivision and in the park beyond) Property values would be significantly reduced This project would impact the beauty of this mountain community The proposed steel structures are significantly larger with additional cables than the current poles This is just the wrong project to be running through a subdivision	Impacts from Alternatives C and C1 improvement of West Pole Hill Road are detailed in **Section 4.16**. Due to Forest Service concerns about improvements to the 4WD section of West Pole Hill Road, Western has determined that no improvements to this section of road would be made as part of the Agency Preferred Alternative. The proposed Project is to replace an existing line - it is not a new line going through undisturbed land. The Project would allow for the removal of one of the existing two lines and abandonment of the associated ROW, improving the visual setting from its current state. Alternatives that maximize the use of existing ROWs are considered to have the least economic effects. Any influence on property values should already be factored into the current existing valuation due to the presence of the existing transmission line, and the easement is already an encumbrance on the property. The replacement of an existing line with a new one should not have a substantial effect on a given property, and landowners have an opportunity to adjust the location of structures on their properties to better suit their needs (within certain engineering constraints). It is Western's goal to have the least possible effect to individual landowners, subdivisions as a whole, and businesses. The economic effect of the proposed project is detailed in **Section 4.13**. In order to reduce visibility, special design measures would be locally considered, including the use of structures with a lower height and shorter span. Lower height structures, if selected, would be approximately 10 to 20 higher than the existing H-frame wooden poles. Commenter is correct that the new double-circuit steel poles would be taller, although any change in conductor diameter would likely be indiscernible. Rationale for the selection of the Agency Preferred Alternative is detailed in **Section 2.8**.	Larry Olson
Alternative	All	No Action	Public	No Action Alternative o Would not support. Steel towers are needed; Single Right-Of-Way is needed; Transmission system upgrades are needed.	Thank you for your comment.	Larry Olson
Alternative	All	A/A1/A2	Public	Alternative A (Variant A 1, A2) -Would support. This routes the project North of Meadowdale Hills subdivision and along the existing North transmission line Right-Of-Way. FIRST CHOICE.	Thank you for your comment.	Larry Olson
Alternative	West	B	Public	Alternative B -Would not support. This routes overhead lines through the Meadowdale subdivision.	Thank you for your comment.	Larry Olson
Alternative	All	C/C1	Public	Alternative C (Variant C1) -Would not support alternative C which routes overhead lines through the subdivision - Could support Variant C1 with underground lines through the subdivision. There would be construction impact. SECOND CHOICE.	Thank you for your comment.	Larry Olson
Alternative	All	D	Public	Alternative D - This is not a good solution. Would not support. This has wooden poles overhead through subdivision and a North & South Right-Of-Way.	Thank you for your comment.	Larry Olson

	Section of Route	Alternative	Public or Agency	Comment	Response	Author
General	West	General	Public	My request is that several of the major decision makers take a tour through Meadowdale Hills subdivision before the decision is made regarding routing of this project. -Take a look. Drive to a house or two. Imagine yourself living there. Then, walk from the house to Pole Hill and continue down to US 36. -You will be able to imagine this visual impact of overhead lines. Residents will be impacted by this for the next 75 - 100 years. We can do better.	Members of the Project team have been to the Meadowdale Hills subdivision, and have examined the route alternatives from the air. The subdivision is crossed by an existing transmission line with adequate existing ROW in most places, so any assessment of impact has to take that fact into account. Most alternatives include the complete removal of one of the existing lines and abandonment of the ROW, a net gain in visual resources to the Estes Park area.	Larry Olson
Alternative	All	A&B	Public	At the meeting held on at the Rialto Theater in Loveland on October 29 all the residence from the Pinewood Reservoir area who spoke stated that Alternative B in that area was their preference and the only reasonable alternative and were against Alternative A except for one person who preferred Alternative A. (There were also folks who spoke against C and D.) All the representatives who were present from Estes Park (or more correctly were concerned about the Estes Park route) who spoke stated they wanted Alternative A in that area. The middle segment is nearly the same for both alternatives so there was no preference stated as I recall. Therefore, it appears the best approach for those present at the Rialto meeting was a combination of Alternatives A and B. As a resident of the Pinewood Reservoir area I do not want my preference (our preference) to come at the expense of the folks affected in the Estes Park area but want a solution that meets both our preferences.	As a result of public input on the Draft EIS, summary tables of impacts have been added to the Final EIS **Section 2.9** that specifically assess impacts of the alternatives at each end of the line. This reorganizing of the data summary in Chapter 2 provides a better means of comparing and contrasting alternatives at the local level. Western respects the reasonableness of the commenter's views, and would make separate and independent decisions on routes on both ends of the proposed Project. As a result Western has used portions of several alternatives to arrive at an Agency Preferred Alternative. Alternative B has been selected on the eastern portion of the project area. Please see **Section 2.8** of the Final EIS for a discussion of the rationale used in selecting the Agency Preferred Alternative.	Phillip Hunger
Alternative	West	A2	Public	The Estes-Flatirons Rebuild will clearly advance our man-made amenities by making our electric power more reliable and fire resistant. The gains in this area, however, may or may not result in a loss of natural amenities. Through WAPA's current plans to consolidate the power lines, fewer intrusions on the natural beauty will occur. By burying the remaining power lines in the Estes Valley, no power lines or power poles will be visible. By following the path they have labeled Variant A2, the clear cutting associated with any of the methods can be moved farther from our transportation routes, residential communities, and recreational areas. Variant A2 gives us clear gains in man-made amenities and enhancements of our natural amenities as well. By taking this opportunity to add value to our community through both better man-made amenities and better display of our natural amenities, WAPA can add value to the Estes Valley in yet another way. The Estes Valley survives economically by hosting millions of guests who are visiting Rocky Mountain National Park. While these guests enjoy the beauty of our natural environment, our shop owners try to make their visits enjoyable, memorable, and restful. By contributing positively to the natural beauty of the Estes Valley, WAPA will contribute to our guests' experiences and to the economic health of the Estes Valley. This can best be accomplished by modernizing our electric transmission using Variant A2, as that minimizes the barriers to the natural beauty and the disruption of our neighborhoods. It seems fair that we citizens of the Estes Valley share with WAPA's other electric service recipients in the costs of having high quality electric service. It also seems fair that all of WAPA's customers share as equally as possible in minimizing the environmental costs of providing their service. By undergrounding the Estes-Flatirons transmission lines using Variant A2 and sharing that extra cost with all affected regional electric customers, WAPA can improve the nature experience of millions of Americans and treat the citizens of the Estes Valley equitably at a monthly cost per customers that is very low. In summary, I ask that you encourage WAPA to enhance the natural beauty of the Estes Valley, add to the economic health of the Estes Valley, and treat its regional customers fairly through embracing Variant A2. If Variant A2 is simply not possible, the next best method for accomplishing these goals is best through Alternative A.	Commenter correctly states that the proposed Project would improve reliability and reduce risk of wildfire-relayed outages, but at the cost of some impact to environmental resources. Removal of one line and abandonment of the existing ROW would allow that line route to revert back to natural vegetation and eventually merge with the rest of the area, and that aspect of the proposed Project is thus a tangible improvement to the Estes Park vicinity. Other adjustments to the line route as included in the Agency Preferred Alternative have also reduced existing impacts, especially visual. Underground vs. overhead lines result in several tradeoffs, as discussed in **Sections 2.2.2**, **2.2.4**, and **2.8**. **Section 2.8** presents the rationale that led to the selection of the Agency Preferred Alternative. Western must carefully consider the costs of its projects, as all costs are recovered in the wholesale power rates it charges its utility customers, and not through tax dollars. In joint participation projects where Western partners with other utilities, the partners must recover their investment through their rates, typically retail rates to end users such as the residents of Estes Park. The costs of this Project would be similarly recovered and would be, therefore, similarly spread to ratepayers directly or indirectly.	Charley L. Dickey IV
Alternative		A2	Public	Form Letter with minor text changes (see Comment Letter 22)	Commenter correctly states that the proposed project would improve reliability and reduce risk of wildfire-relayed outages, but at the cost of some impact to environmental resources. Removal of one line and abandonment of the existing ROW would allow that line route to revert back to natural vegetation and eventually merge with the rest of the area, and that aspect of the proposed Project is thus a tangible improvement to the Estes Park vicinity. Other adjustments to the line route as included in the Agency Preferred Alternative have also reduced existing impacts, especially visual. Underground and overhead construction are fully discussed in **Sections 2.2.2** and **2.2.4** of the Final EIS. This section presents the rationale that led to the selection of the Agency Preferred Alternative. Western must carefully consider the costs of its projects, as all costs are recovered in the wholesale power rates it charges its utility customers, and not through tax dollars. In joint participation projects where Western partners with other utilities, the partners must recover their investment through their rates, typically retail rates to end users such as the residents of Estes Park. The costs of this Project would be similarly recovered and would be, therefore, similarly spread to ratepayers directly or indirectly.	Jean McGuire

	Section of Route	Alternative	Public or Agency	Comment	Response	Author
General	West	General	Public	My comments are specific to the west end of the project. The west end has very different factors than the east end; and it seems the two pieces of the project (and perhaps the center section as a 3rd piece) need to be evaluated on their own merits. Prior to moving forward in the decision-making process, WAPA needs to rewrite the evaluations of the alternatives based on the comparative impacts of each alternative to the west end and east end independently.	Western has adopted the approach suggested by this and other commenters. Impact summary tables have been developed for local impacts at either end of the proposed Projects, and are located in **Section 2.9** of the Final EIS. The corresponding Agency Preferred Alternative figure shows the areas that the data in the tables represents. The data shown was used by Western in support of its determination of the Agency Preferred Alternative.	Keith Pearson
Alternative	West	A2	Public	The most important asset of the Estes Valley is the scenery. It is not a resource that we own… it is a national treasure, belonging to the millions of visitors from around the country. We do not own it, but we are entrusted with its stewardship. Tourism is the lifeblood of Estes Park. This is the reason that Governor Hickenlooper forced the re-opening of Rocky Mountain National Park during the government shutdown. And tourism is the reason the state and national agencies placed US-36 at the top of the priority list after the floods of 2013. These efforts were not only for the sake of Estes Park, but also for the benefit of the State of Colorado, recognizing that tourism in this area is a driving force in the state's economy. The scenery is the reason that tourism is such a big part of our economy. It isn't for the shopping or the dining. People come here for the views. And we must adamantly fight to preserve those views. Therefore, Variant A2, the buried option, is the preferred alternative. WAPA should explore all enabling technologies and funding sources, public and private, to make A2 possible.	Western is very much aware of the value placed on the visual aspects of their environment. **Section 2.8** of the Final EIS describes the rationale behind the selection of the Agency Preferred Alternative. The abandonment of one entire existing ROW is a feature of all alternatives except Alternative D and No Action, and would result in a substantial improvement to visual resources. An underground option was not selected for the reasons discussed in that section. Partial public funding is complicated by regulations governing Western's acceptance of funds from the public; specific Federal-level legislation would likely be required to do this.	Keith Pearson
Alternative, Visual, Economics	West	A2	Public	Form Letter with following addition: I would like to add my support of the option Variant A2 as mentioned and supported by many businesses in the Estes Valley. As a small businessman who is reliant upon the vitality and success of other businesses I must agree that anything done in the Estes Park area must consider the image for our visitors. As I am certain you are aware, considering our visitor based economy, image is one of the primary things we have to offer. I hope you will seriously consider the position expressed in the attached letter.	Western is very much aware of the value placed on the visual aspects of their environment. **Section 2.8** of the Final EIS describes the rationale behind the selection of the Agency Preferred Alternative. Abandonment of one existing ROW would result in an overall improvement to visual resources.	Kent H. Smith
Alternative	East	A &B	Public	My comments pertain to the eastern end of the power transmission line near the Flatiron Substation and Pinewood Reservoir. The proposed route referred to as "Alternative A" and to which all alternatives are compared should not be on the table at all. It is perplexing as to how this proposed route came up for consideration in the first place and why alternatives are being compared to it instead of "Alternative B" which is the established current route with existing rights-of-way since 1930's. During public hearings, resident stakeholders present in Loveland and Estes Park support was overwhelming in support of "Alternative B" (East side) with only 1 resident in support of "Alternative A" (East side).	Members of the public at the routing workshops hosted by Western identified Alternative A as an option they wanted Western to analyze. Western did so, and found a number of issues with access, steep slopes, and constructability, among others. Alternatives were compared and contrasted with each other, not just Alternative A. Alternative A was not selected to be a part of the Agency Preferred Alternative. Alternative B on the east end of the proposed Project has been included as part of the Agency Preferred Alternative.	Lucinda Van Inwagen
Alternative	East	A &B	Public	Two primary thoughts come to mind on how "Alternative A" was proposed in the first place. The first thought: Western Area Power Authorities eyeballed a map without considering the rugged, steep terrain, environmental impact such as deforesting of healthy trees and erosion created by construction, exceptional access challenges to maintenance of power lines and citizen safety created by power outages and the very real potential of fire causing loss of life and property for the people along the Alternative A route. The second thought: Behind the scenes, there have been lines of communication by individuals with possible influence or pressure in order to gain from shifting the existing route, "Alternative B", with historical existing easements to place burden on residents along "Alternative A". Simply stated, shifting from the existing practical route "Alternative B" with easements along the flat, grassy, easily accessible open space areas would directly benefit a small number of residents, primarily ranchers, through the removal of power lines on existing easements dating back to the 1930', thereby shifting the burden and negatives impacts including environmental, potential of fire, and loss of property equity, to innocent individual home owners.	Members of the public at the routing workshops hosted by Western identified Alternative A as an option they wanted Western to analyze. Western did so, and found a number of issues with access, steep slopes, and constructability, among others. Alternatives were compared and contrasted with each other, not just Alternative A. Alternative A was not selected to be a part of the Agency Preferred Alternative.	Lucinda Van Inwagen

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Alternative	All	A	Public	The core truth of the matter, consideration of "Alternative A "is a bad idea, irresponsible and should be off the table due to: ● Significant and real fire hazards with the potential of devastation and loss of property and human life. Any fires along "Alternative A" would surely be hard and costly to defend, requiring firefighters and air support. Issues with construction or maintenance along this route could result in costly lawsuits and litigation involving homeowners, Poudre Valley Rural Area Electric, Western Area Power Authority or the US Forest Service. ● Difficult access and cost to maintain lines during winter and heavy wet seasonal rains would be significantly increased, hampered by the steep, rugged terrain covered by trees in this area. This area historically receives snowfall up to twice as much as the lower flatlands – 8 inches is easily 16 inches of snowfall in this area. It's predictably guaranteed that there would be periods when power line crews would not be able to access this route during severe storms and power outages. Customers would be without power for extended periods of time, which raises health and safety concerns. ● Negative environmental impact including deforestation and erosion to a currently beautiful natural scenic landscape that residents paid a premium to enjoy. Ponderosa Pines are the primary species of tree in the area yet there are a significant number of Douglas Firs in the proposed "Alternative A" area. Defore station including the removal of the Douglas Firs would have negativeecological consequences and disrupt environmental balance. ● Direct financial impact to innocent homeowners affected by "Alternative A". Despite what has been indicated on the environmental impact report, property owners along "Alternative A" (East) would lose the tranquility, views and at least 50% of their property values. Residents along "Alternative A" have higher end homes and paid high premiums their properties. Speaking for us, we have made significant additional investment to our homes including sweat equity improvements over the years. ● Overall understatement and underestimate of the significant costs and impacts of shifting the existing rights of way along "Alternative B" to "Alternative A".	Members of the public at the routing workshops hosted by Western identified Alternative A as an option they wanted Western to analyze. Western did so and, as mentioned by the commenter, found a number of issues with access, steep slopes, and constructability, among others. Alternative A was not selected to be a part of the Agency Preferred Alternative. Alternative B on the east end of the proposed Project has been included as part of the Agency Preferred Alternative.	Lucinda Van Inwagen
Alternative	East	B		Western Area Power Authority has a great public/community relations opportunity here-- to listen and absorb public input, consider valid concerns and comments from the Pinewood Area residents and then make the best possibly route choice for this project which is "Alternative B" (East side). It's very clear that "Alternative B" should be the only route under consideration for the project's east side.	Alternative B on the east end of the proposed Project has been included as part of the Agency Preferred Alternative.	Lucinda Van Inwagen
General	West	General	Public	The truth is, based on today's EPA standards, this project would never have been undertaken in today's environmental milieu. To add to the offense, it is my understanding none of the power generated as a consequence of all this local visual torture actually benefits the citizens in the Estes valley, despite the fact we must tolerate the presence of these eyesores on a daily basis. Now, the time has inevitably arrived that the transmission lines in the Estes region are to be replaced and relocated; the time for decision is upon us.	Western disagrees with the commenter's initial statement. Additionally, Estes Park does receive power generated in the area, in addition to contractual power-flow through Platte River Power Authority of which Estes Park is a part owner; therefore, when the local power plant is not running, Estes Park still receives power from the transmission lines. Transmission lines are a critical element of America's energy infrastructure. Since 1938 and 1953, these lines have both provided and delivered reliable power to Estes and other regions nearby.	Bert Bergland
Visual	All	General	Public	The report provided by WAPA for public consumption is concerning. What seems to be minimized in this report is the impact of a 300 foot swath of clear cut along the course of the project. What many readers of the environmental impact may fail to recognize is that 300' is the equivalent to the length of a football field! Hence, this project would result in an enormous physical and visual scar across the public and private forests east of Estes Park 100 yards wide and 14+ miles long. Additionally, this obnoxious visual scar would be continually "maintained", meaning this clear cut it will exist in perpetuity.	Commenter is misinformed. The ROW width would be 110 feet, as described in **Section 2.2.2**. The ROW would be maintained to NESC standards to ensure reliability. Shrubs and low- or slow-growing species would be allowed within the ROW in compliance with the NERC standards, which are not discretionary. Failure to maintain clearances can result is substantial fines, especially if a utility allows vegetation to encroach and an outage results.	Bert Bergland
Alternative, Visual	All	General	Public	There is at least one more "alternative" that is not offered: closure of the entire system that currently exists, meaning complete removal of the exceptionally distasteful power plant, the hideous metal conduits that scar the north face of Prospect Mountain, the unsightly power grid at the power plant that has marred the Hwy 7- Hwy 36 intersection, ugly metal lattice power structures and lines that currently cross Lake Estes at the causeway, all transmission line structures between East Estes valley to Flatiron, all of which have marred the environment for well over a half century. That is, simply rid us of this entire distasteful invasion of ugliness. Use the money now planned to update the hideous to build a power plant elsewhere, and rid us of this once and for all.	The alternative suggested by the commenter is neither reasonable nor feasible, and it does not respond to the purpose and need for the proposed Project. Therefore, it falls outside the scope of the NEPA analysis.	Bert Bergland

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Alternative, Visual	West	A2	Public	At the very least, we in Estes Park not only expect, but request at a minimum, the burying of the existing power lines across the Lake Estes causeway which have marred the otherwise glorious vistas of Rocky Mountain National Park and the Continental Divide for over half a century. The truth is, Estes Park neither needs, wants nor benefits from this eyesore, and could easily do without its continued existence.	Western understands that Estes Park residents would like to see the lattice steel transmission line along the causeway into the town removed. That section of line is not part of the proposed Project and is therefore outside the scope of this EIS.	Bert Bergland
General	East	C & D	Public	Duplicate of comment letter 17 In talking with Western Power representatives, we have discovered that if the new structures described in the EIS under Alternative D, and possibly Alternative C, are put in place, we could lose most of the land on which the schoolhouse sits, due to the size of the right-of-way needed, especially if the structure is a turning pole, which requires an even larger footprint. As required, Western Power looked into the impact of its proposals on historical structures in the area, but we do not believe the agency did its due diligence. To begin with, the EIS contains inaccurate information. On page 1-5 of the EIS, Western Power states: It should be noted that both of the existing transmission line ROWs were in place prior to these neighborhood developments; the homes were built with the existing transmission lines in place. That information is incorrect. The schoolhouse was in place long before the right-of-way were procured, and the transmission lines were put into place. The current North line, which runs approximately 300 feet north of the schoolhouse, was constructed 28 years after the schoolhouse was built. Furthermore, the agency looked at the schoolhouse not once, but twice, but could not rule out its historical significance (see page 3- 124 for details). While labeling several sites as "determined not eligible" for the National Register of Historic Places, the EIS states the schoolhouse is "recommended" as not eligible, most likely due to the agency's finding that no National Register of Historic Places assessment has been found. We're now in the process of changing that. After seeing that Western Power could not definitively say the schoolhouse was not eligible for National Register of Historic Places status, we looked into the matter, and found that the building should easily qualify under the "Rural School Buildings in Colorado" designation, which is part of the "Multiple Property Listing" types, defined as a series of individual and/or district listings of thematically-related historic properties. ...we are currently in the process of submitting the Pinewood Schoolhouse to be listed in the National Register of Historic Places, and the Colorado State Register of Historic Properties. We would like to point out that in the EIS, Western Power does refer to historical significance as a reason to avoid placing lines. On page S-12 of the EIS summary, you can read about how an alternative route that would have run along the Flatiron Penstocks was dropped, in part, because "the penstocks are iconic facilities that date to the 1940s and have historic significance."	Alternative B on the east end was selected for inclusion in the Agency Preferred Alternative, rendering this concern moot. Text has been revised to state that most but not all of the existing development occurred after the transmission lines were constructed. As detailed in the Addendum report, Western has made the determination that the schoolhouse is not eligible and the Colorado State Historic Preservation Office (SHPO) has concurred. This is based on structural modifications to its original construction over the years that has resulted in the structure no longer retaining sufficient historic integrity as defined in 36 CFR 60 to be included in National Register of Historic Places. Since the Colorado SHPO has determined that the schoolhouse is not eligible, it is also not eligible for the Colorado State Register of Historic Properties. Western is aware of the owners' plans to restore the Pinewood Schoolhouse, and does not dispute that the property has historical interest. The fact that Alternatives C and D were fully analyzed does not mean that the Pinewood Schoolhouse was ignored. Indeed, it was one of the factors that lead to Alternative B being selected for inclusion in the Agency Preferred Alternative. The penstocks and associated facilities are not listed in the NRHP register (See **Tables 3.15-1** and **3.15-2**). There were other factors considered in dismissing the alternative near the Flatiron Penstocks from further analysis.	Gib and Lisa Coalwell
General	East	C & D	Public	With all due respect to those silver pipes, we believe the 1910 schoolhouse has much more iconic appeal and historic significance. In addition, we have found no mention of the penstocks as being eligible for the National Register of Historic Places, so why did Western Power describe them as having "historic significance," and use that criteria as a means to drop a proposed alternative route, when it did not give that same consideration to the schoolhouse? To further solidify the argument against Alternatives C and D, on page 4-146, the EIS states that both alternatives have a greater number of historic properties encountered than the other proposed options. Alternative C would affect nine historic sites, while Alternative D would affect 12 such sites. So, we respectfully ask that Western Power consider dropping both Alternatives C and D. In closing, we wish to add that while we strongly oppose alternatives C and D, we believe that Alternative A on the east side of the project (Pinewood Reservoir area) is equally unfeasible, as backed by arguments you will hear from our neighbors in that area. Alternative B, where the power lines and 100-foot right-of-ways already exist, seems to be the most feasible and logical choice.	Alternative B on the east end was selected for inclusion in the Agency Preferred Alternative, rendering this concern moot. Text has been revised to state that most but not all of the existing development occurred after the transmission lines were constructed. As detailed in the Addendum report, Western has made the determination that the schoolhouse is not eligible and the Colorado State Historic Preservation Office (SHPO) has concurred. This is based on structural modifications to its original construction over the years that has resulted in the structure no longer retaining sufficient historic integrity as defined in 36 CFR 60 to be included in National Register of Historic Places. Since the Colorado SHPO has determined that the schoolhouse is not eligible, it is also not eligible for the Colorado State Register of Historic Properties. Western is aware of the owners' plans to restore the Pinewood Schoolhouse, and does not dispute that the property has historical interest. The fact that Alternatives C and D were fully analyzed does not mean that the Pinewood Schoolhouse was ignored. Indeed, it was one of the factors that lead to Alternative B being selected for inclusion in the Agency Preferred Alternative. The penstocks and associated facilities are not listed in the NRHP register (See **Tables 3.15-1** and **3.15-2**). There were other factors considered in dismissing the alternative near the Flatiron Penstocks from further analysis.	

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Alternative		A2	Public	Form Letter - See comment letter 22 The Estes-Flatirons Rebuild will clearly advance our man-made amenities by making our electric power more reliable and fire resistant. The gains in this area, however, may or may not result in a loss of natural amenities. Through WAPA's current plans to consolidate the power lines, fewer intrusions on the natural beauty will occur. By burying the remaining power lines in the Estes Valley, no power lines or power poles will be visible. By following the path they have labeled Variant A2, the clear cutting associated with any of the methods can be moved farther from our transportation routes, residential communities, and recreational areas. Variant A2 gives us clear gains in man-made amenities and enhancements of our natural amenities as well. By taking this opportunity to add value to our community through both better man-made amenities and better display of our natural amenities, WAPA can add value to the Estes Valley in yet another way. The Estes Valley survives economically by hosting millions of guests who are visiting Rocky Mountain National Park. While these guests enjoy the beauty of our natural environment, our shop owners try to make their visits enjoyable, memorable, and restful. By contributing positively to the natural beauty of the Estes Valley, WAPA will contribute to our guests' experiences and to the economic health of the Estes Valley. This can best be accomplished by modernizing our electric transmission using Variant A2, as that minimizes the barriers to the natural beauty and the disruption of our neighborhoods. It seems fair that we citizens of the Estes Valley share with WAPA's other electric service recipients in the costs of having high quality electric service. It also seems fair that all of WAPA's customers share as equally as possible in minimizing the environmental costs of providing their service. By undergrounding the Estes-Flatirons transmission lines using Variant A2 and sharing that extra cost with all affected regional electric customers, WAPA can improve the nature experience of millions of Americans and treat the citizens of the Estes Valley equitably at a monthly cost per customers that is very low. In summary, I ask that you encourage WAPA to enhance the natural beauty of the Estes Valley, add to the economic health of the Estes Valley, and treat its regional customers fairly through embracing Variant A2. If Variant A2 is simply not possible, the next best method for accomplishing these goals is best through Alternative A.	Commenter correctly states that the proposed Project would improve reliability and reduce risk of wildfire-relayed outages, but at the cost of some impact to environmental resources. Removal of one line and abandonment of the existing ROW would allow that line route to revert back to natural vegetation and eventually merge with the rest of the area, and that aspect of the proposed Project is thus a tangible improvement to the Estes Park vicinity. Other adjustments to the line route as included in the Agency Preferred Alternative would also reduce~~d~~ existing impacts, especially visual. Underground and overhead constriction are fully discussed in **Sections 2.2.2** and **2.2.4**. **Section 2.8** presents the rationale that led to the selection of the Agency Preferred Alternative. Western must carefully consider the costs of its projects, as all costs are recovered in the wholesale power rates it charges its utility customers, and not through tax dollars. In joint participation projects where Western partners with other utilities, the partners must recover their investment through their rates, typically retail rates to end users such as the residents of Estes Park. The costs of this Project would be similarly recovered and would be, therefore, similarly spread to ratepayers directly or indirectly.	Christian Collinet
Alternative		A2	Public	Form Letter with minor text edits - See comment letter 22 The Estes-Flatirons Rebuild will clearly advance our man-made amenities by making our electric power more reliable and fire resistant. The gains in this area, however, may or may not result in a loss of natural amenities. Through WAPA's current plans to consolidate the power lines, fewer intrusions on the natural beauty will occur. By burying the remaining power lines in the Estes Valley, no power lines or power poles will be visible. By following the path they have labeled Variant A2, the clear cutting associated with any of the methods can be moved farther from our transportation routes, residential communities, and recreational areas. Variant A2 gives us clear gains in man-made amenities and enhancements of our natural amenities as well. By taking this opportunity to add value to our community through both better man-made amenities and better display of our natural amenities, WAPA can add value to the Estes Valley in yet another way. The Estes Valley survives economically by hosting millions of guests who are visiting Rocky Mountain National Park. While these guests enjoy the beauty of our natural environment, our shop owners try to make their visits enjoyable, memorable, and restful. By contributing positively to the natural beauty of the Estes Valley, WAPA will contribute to our guests' experiences and to the economic health of the Estes Valley. This can best be accomplished by modernizing our electric transmission using Variant A2, as that minimizes the barriers to the natural beauty and the disruption of our neighborhoods. It seems fair that we citizens of the Estes Valley share with WAPA's other electric service recipients in the costs of having high quality electric service. It also seems fair that all of WAPA's customers share as equally as possible in minimizing the environmental costs of providing their service. By undergrounding the Estes-Flatirons transmission lines using Variant A2 and sharing that extra cost with all affected regional electric customers, WAPA can improve the nature experience of millions of Americans and treat the citizens of the Estes Valley equitably at a monthly cost per customers that is very low. In summary, I ask that you encourage WAPA to enhance the natural beauty of the Estes Valley, add to the economic health of the Estes Valley, and treat its regional customers fairly through embracing Variant A2. If Variant A2 is simply not possible, the next best method for accomplishing these goals is best through Alternative A.	Commenter correctly states that the proposed Project would improve reliability and reduce risk of wildfire-relayed outages, but at the cost of some impact to environmental resources. Removal of one line and abandonment of the existing ROW would allow that line route to revert back to natural vegetation and eventually merge with the rest of the area, and that aspect of the proposed Project is thus a tangible improvement to the Estes Park vicinity. Other adjustments to the line route as included in the Agency Preferred Alternative would also reduce~~d~~ existing impacts, especially visual. Underground and overhead constriction are fully discussed in **Sections 2.2.2** and **2.2.4**. **Section 2.8** presents the rationale that led to the selection of the Agency Preferred Alternative. Western must carefully consider the costs of its projects, as all costs are recovered in the wholesale power rates it charges its utility customers, and not through tax dollars. In joint participation projects where Western partners with other utilities, the partners must recover their investment through their rates, typically retail rates to end users such as the residents of Estes Park. The costs of this Project would be similarly recovered and would be, therefore, similarly spread to ratepayers directly or indirectly.	Janine Dawley

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Alternative		A2	Public	Form Letter - See comment letter 22 The Estes-Flatirons Rebuild will clearly advance our man-made amenities by making our electric power more reliable and fire resistant. The gains in this area, however, may or may not result in a loss of natural amenities. Through WAPA's current plans to consolidate the power lines, fewer intrusions on the natural beauty will occur. By burying the remaining power lines in the Estes Valley, no power lines or power poles will be visible. By following the path they have labeled Variant A2, the clear cutting associated with any of the methods can be moved farther from our transportation routes, residential communities, and recreational areas. Variant A2 gives us clear gains in man-made amenities and enhancements of our natural amenities as well. By taking this opportunity to add value to our community through both better man-made amenities and better display of our natural amenities, WAPA can add value to the Estes Valley in yet another way. The Estes Valley survives economically by hosting millions of guests who are visiting Rocky Mountain National Park. While these guests enjoy the beauty of our natural environment, our shop owners try to make their visits enjoyable, memorable, and restful. By contributing positively to the natural beauty of the Estes Valley, WAPA will contribute to our guests' experiences and to the economic health of the Estes Valley. This can best be accomplished by modernizing our electric transmission using Variant A2, as that minimizes the barriers to the natural beauty and the disruption of our neighborhoods. It seems fair that we citizens of the Estes Valley share with WAPA's other electric service recipients in the costs of having high quality electric service. It also seems fair that all of WAPA's customers share as equally as possible in minimizing the environmental costs of providing their service. By undergrounding the Estes-Flatirons transmission lines using Variant A2 and sharing that extra cost with all affected regional electric customers, WAPA can improve the nature experience of millions of Americans and treat the citizens of the Estes Valley equitably at a monthly cost per customers that is very low. In summary, I ask that you encourage WAPA to enhance the natural beauty of the Estes Valley, add to the economic health of the Estes Valley, and treat its regional customers fairly through embracing Variant A2. If Variant A2 is simply not possible, the next best method for accomplishing these goals is best through Alternative A.	Commenter correctly states that the proposed Project would improve reliability and reduce risk of wildfire-relayed outages, but at the cost of some impact to environmental resources. Removal of one line and abandonment of the existing ROW would allow that line route to revert back to natural vegetation and eventually merge with the rest of the area, and that aspect of the proposed Project is thus a tangible improvement to the Estes Park vicinity. Other adjustments to the line route as included in the Agency Preferred Alternative would also reduce~~d~~ existing impacts, especially visual. Underground and overhead construction are fully discussed in **Sections 2.2.2** and **2.2.4**. **Section 2.8** presents the rationale that led to the selection of the Agency Preferred Alternative. Western must carefully consider the costs of its projects, as all costs are recovered in the wholesale power rates it charges its utility customers, and not through tax dollars. In joint participation projects where Western partners with other utilities, the partners must recover their investment through their rates, typically retail rates to end users such as the residents of Estes Park. The costs of this Project would be similarly recovered and would be, therefore, similarly spread to ratepayers directly or indirectly.	Paul and Ingrid Drouin
Alternative		A2	Public	Form Letter - See comment letter 22 The Estes-Flatirons Rebuild will clearly advance our man-made amenities by making our electric power more reliable and fire resistant. The gains in this area, however, may or may not result in a loss of natural amenities. Through WAPA's current plans to consolidate the power lines, fewer intrusions on the natural beauty will occur. By burying the remaining power lines in the Estes Valley, no power lines or power poles will be visible. By following the path they have labeled Variant A2, the clear cutting associated with any of the methods can be moved farther from our transportation routes, residential communities, and recreational areas. Variant A2 gives us clear gains in man-made amenities and enhancements of our natural amenities as well. By taking this opportunity to add value to our community through both better man-made amenities and better display of our natural amenities, WAPA can add value to the Estes Valley in yet another way. The Estes Valley survives economically by hosting millions of guests who are visiting Rocky Mountain National Park. While these guests enjoy the beauty of our natural environment, our shop owners try to make their visits enjoyable, memorable, and restful. By contributing positively to the natural beauty of the Estes Valley, WAPA will contribute to our guests' experiences and to the economic health of the Estes Valley. This can best be accomplished by modernizing our electric transmission using Variant A2, as that minimizes the barriers to the natural beauty and the disruption of our neighborhoods. It seems fair that we citizens of the Estes Valley share with WAPA's other electric service recipients in the costs of having high quality electric service. It also seems fair that all of WAPA's customers share as equally as possible in minimizing the environmental costs of providing their service. By undergrounding the Estes-Flatirons transmission lines using Variant A2 and sharing that extra cost with all affected regional electric customers, WAPA can improve the nature experience of millions of Americans and treat the citizens of the Estes Valley equitably at a monthly cost per customers that is very low. In summary, I ask that you encourage WAPA to enhance the natural beauty of the Estes Valley, add to the economic health of the Estes Valley, and treat its regional customers fairly through embracing Variant A2. If Variant A2 is simply not possible, the next best method for accomplishing these goals is best through Alternative A.	Commenter correctly states that the proposed Project would improve reliability and reduce risk of wildfire-relayed outages, but at the cost of some impact to environmental resources. Removal of one line and abandonment of the existing ROW would allow that line route to revert back to natural vegetation and eventually merge with the rest of the area, and that aspect of the proposed Project is thus a tangible improvement to the Estes Park vicinity. Other adjustments to the line route as included in the Agency Preferred Alternative would also reduce~~d~~ existing impacts, especially visual. Underground and overhead construction are fully discussed in **Sections 2.2.2** and **2.2.4**. **Section 2.8** presents the rationale that led to the selection of the Agency Preferred Alternative. Western must carefully consider the costs of its projects, as all costs are recovered in the wholesale power rates it charges its utility customers, and not through tax dollars. In joint participation projects where Western partners with other utilities, the partners must recover their investment through their rates, typically retail rates to end users such as the residents of Estes Park. The costs of this Project would be similarly recovered and would be, therefore, similarly spread to ratepayers directly or indirectly.	Rainer Schelp

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Alternative		A2	Public	Form Letter - See comment letter 22 The Estes-Flatirons Rebuild will clearly advance our man-made amenities by making our electric power more reliable and fire resistant. The gains in this area, however, may or may not result in a loss of natural amenities. Through WAPA's current plans to consolidate the power lines, fewer intrusions on the natural beauty will occur. By burying the remaining power lines in the Estes Valley, no power lines or power poles will be visible. By following the path they have labeled Variant A2, the clear cutting associated with any of the methods can be moved farther from our transportation routes, residential communities, and recreational areas. Variant A2 gives us clear gains in man-made amenities and enhancements of our natural amenities as well. By taking this opportunity to add value to our community through both better man-made amenities and better display of our natural amenities, WAPA can add value to the Estes Valley in yet another way. The Estes Valley survives economically by hosting millions of guests who are visiting Rocky Mountain National Park. While these guests enjoy the beauty of our natural environment, our shop owners try to make their visits enjoyable, memorable, and restful. By contributing positively to the natural beauty of the Estes Valley, WAPA will contribute to our guests' experiences and to the economic health of the Estes Valley. This can best be accomplished by modernizing our electric transmission using Variant A2, as that minimizes the barriers to the natural beauty and the disruption of our neighborhoods. It seems fair that we citizens of the Estes Valley share with WAPA's other electric service recipients in the costs of having high quality electric service. It also seems fair that all of WAPA's customers share as equally as possible in minimizing the environmental costs of providing their service. By undergrounding the Estes-Flatirons transmission lines using Variant A2 and sharing that extra cost with all affected regional electric customers, WAPA can improve the nature experience of millions of Americans and treat the citizens of the Estes Valley equitably at a monthly cost per customers that is very low. In summary, I ask that you encourage WAPA to enhance the natural beauty of the Estes Valley, add to the economic health of the Estes Valley, and treat its regional customers fairly through embracing Variant A2. If Variant A2 is simply not possible, the next best method for accomplishing these goals is best through Alternative A.	Commenter correctly states that the proposed Project would improve reliability and reduce risk of wildfire-relayed outages, but at the cost of some impact to environmental resources. Removal of one line and abandonment of the existing ROW would allow that line route to revert back to natural vegetation and eventually merge with the rest of the area, and that aspect of the proposed Project is thus a tangible improvement to the Estes Park vicinity. Other adjustments to the line route as included in the Agency Preferred Alternative would also reduce~~d~~ existing impacts, especially visual. Underground and overhead construction are fully discussed in **Sections 2.2.2** and **2.2.4**. **Section 2.8** presents the rationale that led to the selection of the Agency Preferred Alternative. Western must carefully consider the costs of its projects, as all costs are recovered in the wholesale power rates it charges its utility customers, and not through tax dollars. In joint participation projects where Western partners with other utilities, the partners must recover their investment through their rates, typically retail rates to end users such as the residents of Estes Park. The costs of this Project would be similarly recovered and would be, therefore, similarly spread to ratepayers directly or indirectly.	Scot A. Ritchie
Alternative		A2	Public	Form Letter - See comment letter 22 The Estes-Flatirons Rebuild will clearly advance our man-made amenities by making our electric power more reliable and fire resistant. The gains in this area, however, may or may not result in a loss of natural amenities. Through WAPA's current plans to consolidate the power lines, fewer intrusions on the natural beauty will occur. By burying the remaining power lines in the Estes Valley, no power lines or power poles will be visible. By following the path they have labeled Variant A2, the clear cutting associated with any of the methods can be moved farther from our transportation routes, residential communities, and recreational areas. Variant A2 gives us clear gains in man-made amenities and enhancements of our natural amenities as well. By taking this opportunity to add value to our community through both better man-made amenities and better display of our natural amenities, WAPA can add value to the Estes Valley in yet another way. The Estes Valley survives economically by hosting millions of guests who are visiting Rocky Mountain National Park. While these guests enjoy the beauty of our natural environment, our shop owners try to make their visits enjoyable, memorable, and restful. By contributing positively to the natural beauty of the Estes Valley, WAPA will contribute to our guests' experiences and to the economic health of the Estes Valley. This can best be accomplished by modernizing our electric transmission using Variant A2, as that minimizes the barriers to the natural beauty and the disruption of our neighborhoods. It seems fair that we citizens of the Estes Valley share with WAPA's other electric service recipients in the costs of having high quality electric service. It also seems fair that all of WAPA's customers share as equally as possible in minimizing the environmental costs of providing their service. By undergrounding the Estes-Flatirons transmission lines using Variant A2 and sharing that extra cost with all affected regional electric customers, WAPA can improve the nature experience of millions of Americans and treat the citizens of the Estes Valley equitably at a monthly cost per customers that is very low. In summary, I ask that you encourage WAPA to enhance the natural beauty of the Estes Valley, add to the economic health of the Estes Valley, and treat its regional customers fairly through embracing Variant A2. If Variant A2 is simply not possible, the next best method for accomplishing these goals is best through Alternative A.	Commenter correctly states that the proposed Project would improve reliability and reduce risk of wildfire-relayed outages, but at the cost of some impact to environmental resources. Removal of one line and abandonment of the existing ROW would allow that line route to revert back to natural vegetation and eventually merge with the rest of the area, and that aspect of the proposed Project is thus a tangible improvement to the Estes Park vicinity. Other adjustments to the line route as included in the Agency Preferred Alternative would also reduce~~d~~ existing impacts, especially visual. Underground and overhead construction are fully discussed in **Sections 2.2.2** and **2.2.4**. **Section 2.8** presents the rationale that led to the selection of the Agency Preferred Alternative. Western must carefully consider the costs of its projects, as all costs are recovered in the wholesale power rates it charges its utility customers, and not through tax dollars. In joint participation projects where Western partners with other utilities, the partners must recover their investment through their rates, typically retail rates to end users such as the residents of Estes Park. The costs of this Project would be similarly recovered and would be, therefore, similarly spread to ratepayers directly or indirectly.	Paula Scheil

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Alternative	All	General	Public	The Draft Environmental Impact Statement DOE/EIS-0483 is Incomplete. The draft EIS does not adequately compare the additional possible variants in which one alternative is preferred for the eastern segment and another alternative is preferred for the western segment. Such a hybrid alternative could be optimized for both the eastern and western ends. For example: Alternative B is the preferred option for the Pinewood area, while Alternative A could be the preferred option for the Lake Estes area. The draft EIS does not compare this hybrid variant, and it is not included in the Table S- 4, "Measurement Indicators for Key and Other Issues". This has the potential to omit from consideration the best, most cost-effective routing possible for the power line rebuild.	Western has since the beginning of the proposed Project considered using segments of various alternatives to create an Agency Preferred Alternative, and we regret that this possibility was not made more clear. Western has in fact used portions of several alternatives - please see **Section 2.8** for a description of the Agency Preferred Alternative and the rationale used to select it. Western has also prepared new summary impact tables for the Final EIS to both show the impacts at both ends of the proposed Project without the influence of data from the rest of the line, and to help determine the Agency Preferred Alternative.	Jeff Barina
Electrical	All	B	Public	The Effects on Human Health from Nearby Transmission Lines The effects of electro-magnetic fields (EMF) on human health are inconclusive, at present. Debate continues in the medical field over the causal relationship between EMF and diseases, such as leukemia. However, the draft EIS dismisses the possible health concerns as "negligible". Meanwhile, the medical community cautions that the possibility is not negligible, and that power lines should be located away from more populated areas. In the Pinewood area, Alternative B is the least populated route. The least populated route should also be chosen for the Estes Park area.	Commenter is correct that 40-odd years of research has not demonstrated a link between EMF exposure and human health effects. While some suggestions of a relationship have been reported, the degree of association has been weak, and study results have not been replicated, a critical factor in scientific proof. The transmission lines would be designed to minimize EMF and would produce electric fields that are 70 percent less at the edge of the ROW than the existing lines, due to the cancellation effects from conductor arrangement on double-circuit lines. Additionally, the new double-circuit line would reduce magnetic field levels to less than the existing H-frame line within a 110-foot ROW. A more detailed description of EMF as they relate to potential health effects is found in **Sections 3.14.1.3** and **4.14.5.1**. Alternative B has been included as part of the Agency Preferred Alternative, but not because of EMF concerns.	Jeff Barina
Electrical, Economics	East	B	Public	The Negative Effects on Property Values from EMF Sources Regardless of a final determination of effects on health, EMF sources are perceived by the public as potentially or actually harmful to health. It matters not whether this is factual. Private property values will decline precipitously, not only from the visual blight of transmission lines, but also from the public perception that power transmission lines create EMFs that can harm health. Soothing words minimizing EMF effects as "negligible" will not allay these fears, nor will they convince a buyer to purchase property near a power line. This is especially pertinent to landowners on which new ROWs will be acquired, such as landowners along Alternative A near Pinewood. For that reason, Alternative B with its existing ROW is the preferred route near Pinewood.	Commenter may well be correct that proximity to a transmission line and EMF source may cause a potential buyer to not purchase a particular property. However, property valuations are based on actual property transactions, and the studies done on transmission lines and property values largely show no or minor negative impacts to property values, and that any impacts tend to diminish over a few years. What the studies indicate is that while some people may object to the presence of a transmission line, there are still enough ready buyers that property values are not greatly affected, and the longer a line is present the more it becomes part of the backgrounds, and the less of a factor it is. Western also notes that these studies look at the impact of a new transmission line on property values, and not an upgrade of an existing line, where valuation considerations would be expected to be embedded in the present value of the property, and the presence of a line has been accepted.	Jeff Barina
Vegetation	East	A & B	Public	Forest Diversity Negatively Affected by Removal of a Minority Species The forest between the Flatiron substation and Lake Estes is predominately Ponderosa pine trees, with a minority species of Douglas fir trees. Alternative A would route the transmission lines over Green Mountain and through a healthy stand of fir trees, which is a minority species in the Pinewood area. The destruction of this minority species will negatively impact the forest in various ways: i. Reduced diversity of the forest ii. Diminished regeneration of pine beetle-kill areas iii. Increased forest susceptibility to mistletoe disease These negative impacts are not in play with the choice of Alternative B in the Pinewood area.	The exact route that Alternative A would take around the back side of Green Mountain was never established, and siting could take into account the presence of Douglas fir trees and avoid them to the extent possible. However, Alternative A was not included in the Agency Preferred Alternative.	Jeff Barina
Alternative	East	General	Public	...these comments will apply only to the eastern segment of the rebuild project, the area around Pinewood reservoir and the Flatiron substation. There are two existing power transmission lines in service near the Flatiron substation and Pinewood Reservoir. One line runs roughly on the north side of County Road 18E, and is referred as the "north" line. The second line runs roughly on the south side of the same road and is referred as the "south" line. These two transmission lines run along rights-of-way (ROWs) that have been established and used in their present location for decades, since the 1930's and 1950's. They should be reused for the transmission line rebuild to the greatest extent. Utilization of existing ROWs is beneficial for a variety of reasons, among them: - It is more efficient and allows faster progress for the rebuild effort; - Cost is typically much less than acquiring new ROWs; - Potential litigation and other delays from newly affected landowners are minimized.	Western agrees with the commenter that existing ROWs should be reutilized whenever practicable. However, transmission line upgrades also provide the opportunity to relocate sections of line to avoid encroachments, avoid sensitive resources, relieve identified impacts (e.g., erosion areas) , accommodate planned development, and otherwise respond to the situation as it presently exists.	Jeff Barina
Socioeconomics	All	A	Public	Arguments Against Alternative A: Alternative A seeks to deviate from the existing, long-established ROWs. Property owners over the years have purchased land, planned, built homes/structures and otherwise developed their land based on these long-time established ROWs. Abandoning these ROWs and now imposing new easements causes severe, undue and unnecessary harm on a new set of landowners.	Alternative A was not selected as part of the Agency Preferred Alternative on the eastern end of the proposed Project.	Jeff Barina

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Alternative	All	A	Public	Acquiring new ROWs along Alternative A is more costly and time-consuming than using the existing ROWs of the "north" and "south" lines, resulting in slower and more expensive progress. PVREA customers will bear these costs as higher electric bills.	Alternative A was not selected as part of the Agency Preferred Alternative.	Jeff Barina
Transportation	All	A	Public	Alternative A would traverse extremely steep terrain. The steep terrain would make ROWs and access roads difficult to create, expensive to maintain, and subject to severe erosion. Snow cover on the steeper sections of these roads would make navigation of maintenance vehicles difficult or impossible. Transmission line maintenance would likely have to be excluded during winter months. More troubling is that essential or emergency repairs during winter months may be especially hampered by the steep, snow-covered access roads.	Alternative A was included in the Draft EIS at the request of members of the public. Western agrees that the concerns raised by this commenter and others are valid. Alternative A was not included in the Agency Preferred Alternative.	Jeff Barina
Alternative	All	A	Public	Alternative A would pass through thickly forested areas. Sources of ignition – from maintenance activities or the transmission lines themselves – could easily ignite a tinder-dry forested area.	Western would continue to utilize long-established safety practices during construction, operation, and maintenance of any alternative to ensure adequate protection against fire hazards. The new steel poles, coupled with new conductors and more modern design standards would also enhance fire safety. More information on fire management is located in **Section 4.7.3.3** Fuels and Fire Management. In any case, Alternative A has not been selected for inclusion in the Agency Preferred Alternative.	Jeff Barina
Alternative		A	Public	There are many residences within tens of feet of Alternative A's routing. Even more residences and structures are within a quarter-mile of the proposed route. The resulting liability from fire losses could be very significant. This liability would be compounded by WAPA's decision to deliberately and knowingly favor Alternative A, while a less fire-prone, less steep, less inhabited and more accessible option exists, such as the "south" ROW.	Western would employ a 110-foot-wide ROW that would maintain an adequate and safe set-back between the transmission line and residences on all alternatives. Western would continue to utilize long-established safety practices during construction, operation, and maintenance to ensure adequate protection against fire hazards. The new steel poles, coupled with new conductors and more modern design standards would also enhance fire safety. More information on fire management is located in **Section 4.7.3.3** Fuels and Fire Management. In any case, Alternative A has not been selected for inclusion in the Agency Preferred Alternative.	Jeff Barina
Alternative	All	A	Public	Let me cite just one example: I'm sure you are aware that in 2011, there was a devastating fire in New Mexico. It was called the "Las Conchas fire", one of the largest, most destructive fires in that state's history. The liability and those responsible for the damages are still being fought in court. The US Forest Service is billing the local electric cooperative (Jemez Mountains Electric Cooperative) for $38 million dollars in firefighting costs and damages. Homeowners and insurance companies are also litigating. On the other hand, the coop is claiming the Forest Service is liable. It is a protracted mess. The fire was started by a downed power line from a falling tree during high winds. We have the exact same conditions here in Colorado: --Thick forests with tall trees -- Very high winds -- tinder-dry conditions Why would we perpetuate the same disastrous mistake here in Colorado? Alternative A would do exactly that -- by running a new power transmission line through tall trees, in steep terrain, in a wind-prone area, that is extremely dry. The only difference this time? The fire would be known as the "WAPA Alternative A fire". A less liable, much safer, and smarter alternative exists with Alternative B.	Western would employ a 110-foot-wide ROW (**Table 2.2-1**) that would maintain an adequate and safe set-back between the transmission line and residences. Western would continue to utilize long-established safety practices during construction, operation, and maintenance to ensure adequate protection against fire hazards. The new steel poles, coupled with new conductors and more modern design standards would also enhance fire safety. More information on fire management is located in **Section 4.7.3.3** Fuels and Fire Management. Western would also follow NESC vegetation management standards to ensure encroaching vegetation would not cause arcing and a potential ignition source. It should be pointed out that clearing to current (National Electric Safety Code) NESC standards may increase visual impacts, just one of the unavoidable tradeoffs Western must consider. Alternative A was not included in the Agency Preferred Alternative.	Jeff Barina
Alternative	East	B	Public	Arguments For Alternative B (with two options): Alternative B is the preferred choice for the transmission line rebuild near the Flatiron – Pinewood Reservoir area. It re uses the existing "south" ROW that has been in service for decades. Over the years, stakeholders have purchased land and developed their properties based on the location of this ROW.	Thank you for your comment. Alternative B has been selected as part of the Agency Preferred Alternative on the eastern end of the proposed Project.	Jeff Barina
Alternative	East	B	Public	Alternative B uses the "south" ROW near the Flatiron substation, which already has adequate width to meet current standards. Costs are minimized since the acquisition of additional ROWs is not necessary.	Alternative B was selected as part of the Agency Preferred Alternative.	Jeff Barina
Alternative	All	B	Public	Table S4, "Measurement Indicators for Key and Other Issues", outlined in the draft Environmental Impact Statement (EIS), consistently shows Alternative B to have the smallest adverse impact on stakeholders. For example: Alternative B affects the fewest landowners (19 vs. 36-48); and fewest acres of new ROW acquisition (42 vs. 110-177). Alternative B also has the highest positive effect for the number of landowners with ROWs to be decommissioned (51 vs. 7-36). Totaling all line items in Table S4, Alternative B has 19 favorable outcomes. The nearest competitor is Alternative C1 at 11 favorable outcomes, while the undesirable Alternative A has only 8 favorable outcomes. Alternative B is clearly the best choice, according to Table S4.	Alternative B was selected as part of the Agency Preferred Alternative. The rationale for the Agency Preferred Alternative is detailed in **Section 2.8**.	Jeff Barina

	Section of Route	Alternative	Public or Agency	Comment	Response	Author
Alternative	East	B	Public	Alternative B benefits the many landowners in the Newell Lake subdivision by decommissioning the transmission lines through the subdivision and along County Rd 18E.	Alternative B was selected as part of the Agency Preferred Alternative.	Jeff Barina
Alternative	East	B	Public	WAPA's assumed risk and liability from fire hazard is minimized with the choice of Alternative B. The "south" ROW between the Flatiron substation and Pinewood reservoir is not in a forested area, has fewer at-risk structures and consists mostly of grasses and low-growing shrubs. Ignition sources are less likely to cause a wildfire outbreak, and tree canopy fires could not form. The proximity of County Road 18E provides easy access for firefighting ground equipment, and easy access to the transmission line. Alternative B compares very favorably to other alternatives that are routed through steep, inaccessible terrain with forested landscapes.	Alternative B was selected as part of the Agency Preferred Alternative.	Jeff Barina
Visual	East	B	Public	An Option: Alternative B passes by the south end of Pinewood Reservoir, through an area some refer to as "Rattlesnake Park". The visual impact from Alternative B can be reduced with the use of wooden H-frame structures that can support a double circuit, contrary to what is stated in the draft EIS, page 2-41: 2.7.2 Alternative Structure Types In addition to routing options, alternative project designs were considered and presented during the public workshops held in October 2012. Other structure types considered included a lattice structure and double-circuit H-frame. Neither the lattice nor double-circuit H-frame designs were supported by public comments, and were not carried forward for further analysis. The wooden double-circuit H-frame designs would be far less objectionable than the steel monopoles. We would like WAPA to reconsider in favor of the wooden double-circuit H-frame designs.	Double circuit wood-H-frames compromise transmission line reliability and don't meet WAPA's Purpose and Need. Steel monopoles combine long term transmission line reliability with the lowest life cycle cost compared to wood structures. Additionally, visual impact may be reduced based on the longer span length for steel monopoles compared to wood-H-frames, roughly 25 percent fewer structures per mile (see **Table 2.2-1**).	Jeff Barina
Alternative	East	B	Public	A Second Option: Add a Variant to Alternative B that includes underground burial of the transmission line through Pinewood Reservoir County Park, also known as "Rattlesnake Park". This is analogous to the Variant C1, in which the westernmost 2.7 mile section near Lake Estes is constructed underground. Stakeholders on the eastern end should receive equivalent consideration for this option as are stakeholders on the western end.	A discussion of the rationale for not considering underground construction is found in **Section 2.8** of the Final EIS.	Jeff Barina
Socioeconomics	All	A	Public	Comments: Rebuttal to Arguments for Alternative A The proponents of Alternative A (hereafter referred to as "proponents") are those seeking the removal of the rights-of-way (ROWs) from their property. Proponents are also those seeking to remove the poles and lines from their scenic view across private and public lands. If the proponents are successful, a new and innocent group of landowners - - those along the proposed Alternative A route – would be burdened with new easements on their land. They would bear the cost in the form of new ROWs, and they would suffer from the diminished value of their property. This amounts to an illegitimate transfer of property encumbrances and restrictions from one group of landowners to another.	As the commenter notes, Alternative A was identified by members of the public for analysis in the EIS. Western evaluated this option and determined that the route had a number of issues, including access, steep terrain, and general constructability. Alternative A was not included as part of the Agency Preferred Alternative.	Jeff Barina
Socioeconomics	East	A	Public	The key issue is that the north and south ROWs have existed for decades. And most, if not all, of the proponents in the Pinewood area purchased their properties willingly and with full knowledge that their land was subject to these ROWs. Conversely, those along the proposed route -- and not in favor of Alternative A -- had no such knowledge. They purchased property that was specifically not subject to these easements.	Thank you for your comment. Alternative A is not part of the Agency Preferred Alternative.	Jeff Barina
Socioeconomics	All	A	Public	In essence then, this is a case wherein one group of landowners would transfer property restrictions to another. That first group stands to gain with increased land values at the expense of the second group, whose property will be newly encumbered and newly devalued. WAPA, in choosing Alternative A, would be the facilitating agency for this illegitimate transfer of property restrictions.	Alternative B has been selected as part of the Agency Preferred Alternative on the eastern end of the proposed Project. **Section 4.13.5** of the Final EIS discusses the potential impacts on land valuation.	Jeff Barina
Alternative	All	B	Public	The solution is Alternative B: -- Alternative B uses the south ROW, a long-established easement familiar to and accepted by the landowners in the area. -- It successfully removes the north ROW from the property of most proponents and increases land values. -- It does not transfer property restrictions to a new, innocent set of landowners.	Alternative B has been selected as part of the Agency Preferred Alternative. The rationale for the Agency Preferred Alternative is detailed in **Section 2.8**.	Jeff Barina

	Section of Route	Alternative	Public or Agency	Comment	Response	Author
Socioeconomics	All	General	Public	The remaining issue of protecting scenic views across public open space is important, but it should not be paid for on the backs of other, innocent, private landowners – those landowners who are not even adjacent to the open space.	Thank you for your comment.	Jeff Barina
Socioeconomics	All	General	Public	Instead, the cost for protecting scenic views through public lands – which is a public benefit -- should be paid for by the public. One suggestion is to use the double-circuit wooden H-frame structures to minimize the visual impact to the scenic view. This is less expensive and much preferred to the steel monopoles. Another suggestion is using higher electric rates to pay the added cost of underground construction. Yet a third method would use public funds - perhaps through park fees, Great Outdoors Colorado (GOCO) grants or other means - to help fund underground construction through the public open space areas.	A discussion of the rationale for not considering underground construction is found in **Section 2.8** of the Final EIS. Double circuit wood-H-frames compromise transmission line reliability and don't meet WAPA's Purpose and Need. Steel monopoles combine long term transmission line reliability with the lowest life cycle cost compared to wood structures. Additionally, visual impact may be reduced based on the longer span length for steel monopoles compared to wood-H-frames, roughly 25 percent fewer structures per mile (see **Table 2.2-1**). Partial public funding is complicated by regulations governing Western's acceptance of funds from the public; legislation would likely be required to do this. Lacking public or appropriated funding from Congress, electrical power rates (either Western's wholesale power rates or participating utilities retail consumer rates) would pay for the proposed Project in any event.	Jeff Barina
Alternative	West	A2	Public	My family supports burying power lines in the Estes Valley and Variant A2. Burying lines in the valley and routing new lines in a manner that doesn't impact view corridors for Colorado's premier national park, Rocky Mountain National Park is what must be done. This is not a short term item (rerouting power lines) and the greatest care must be taken to do it right. Form Letter - See comment letter 22	Visual impacts are complicated, and underground construction may not reduce visual impacts as much as supposed. A 50-foot completely cleared ROW would be required to be maintained over an underground line. **Section 3.12.2.1** shows visual simulations looking back from near the Park, and it is the ROW that is apparent and not the structures. An above-ground line would allow for shrubs and low- or slow-growing woody species in the ROW which would add darker greens to the more tan grass areas. **Section 2.8** provides a discussion of the rationale supporting the selection of the Agency Preferred Alternative.	Ron & Ann Wilcocks
Alternative		A2	Agency-ARD Directors	Form Letter with minor text edits - See comment letter 22 Furthermore, the desires of full time citizens of Estes Park are often ignored. ARD has tried to represent the interests of citizens by making responsible development our major theme.	Commenter correctly states that the proposed project would improve reliability and reduce risk of wildfire-relayed outages, but at the cost of some impact to environmental resources. Removal of one line and abandonment of the existing ROW would allow that line route to revert back to natural vegetation and eventually merge with the rest of the area, and that aspect of the proposed Project is thus a tangible improvement to the Estes Park vicinity. Other adjustments to the line route as included in the Agency Preferred Alternative would also reduce~~d~~ existing impacts, especially visual. Underground and overhead line construction are fully discussed in **Sections 2.2.2** through **2.2.4** of the Final EIS. **Section 2.8** of the Final EIS presents the rationale that led to the selection of the Agency Preferred Alternative. Western must carefully consider the costs of its projects, as all costs are recovered in the wholesale power rates it charges its utility customers, and not through tax dollars. In joint participation projects where Western partners with other utilities, the partners must recover their investment through their rates, typically retail rates to end users such as the residents of Estes Park. The costs of this Project would be similarly recovered and would be, therefore, similarly spread to ratepayers directly or indirectly.	Thomas Gootz, Rebecca Urquhart, Chris Reveley
Visual	All	General	Public	The proposed and significantly taller steel poles will greatly impact the existing natural landscape. The proposed steel poles will be 40% higher and will provide an industrial look to the natural forest lands. Because the route follows the ridge lines, the impact of the taller steel poles will be even more pronounced. It is my understanding that it will take more steel poles spaced closer together to accomplish the same support the current wooded "H" structures now provide. Lower height wooden structures, while not attractive; blend with the natural forest environment better than reflective galvanized steel towers the height of a ten story building.	Commenter understands that the steel poles would be taller and closer together, which is generally incorrect. **Table 2.2-1** shows that the ruling spans would be longer for the steel pole line, therefore visual impact may be reduced based on the longer span length for steel monopoles compared to wood-H-frames, roughly 25 percent fewer structures per mile. Steel monopoles combine long term transmission line reliability with the lowest life cycle cost compared to wood structures. Reduced structure height would reduce the span length between structures at the visual expense of more structures per mile. Opinions vary as to whether fewer taller structures or more shorter structures is visually less impacting, and the effects vary with viewer location. It is not possible to use the height of the existing structures with a double-circuit line due to the necessity of maintaining proper clearances from the ground and between conductors. The effects of structure types are taken into consideration by Western as discussed in **Section 2.2.2** of the Final EIS.	Steven A. Goodroad
Alternative	All	General	Public	WAPA should use its existing rights of way and not increase the easement width. Increasing the clear-cut easement width combined with the steel poles will exacerbate the "industrial" look and impacts to the natural forest lands.	The ROW width is dictated by the double-circuit 115-kV line and NERC clearance standards. Compliance is required; failure to maintain specified clearance from vegetation can result in outages, potential fire ignition, and substantial fines to utilities including Western. Sufficient NERC specified clearances for the existing line or any proposed alternative, including D, would need to be implemented.	Steven A. Goodroad
Wildlife	All	General	Public	I believe WAPA's EIS falls short addressing the impacts steel towers will have on our raptor population. Because the steel towers are used as a part of the grounding system for the power line, they are known to increase accidental electrocution of raptors. Non-conductive wood poles in combination with phase protection at the poles would help mitigate accidental raptor electrocutions.	Electrocution of raptors is not an issue with transmission lines of this voltage, because the clearances between grounded components such as structures and davits to the energized conductor needed to prevent flashover are too great for the largest raptor to contact ground and conductor at the same moment to be electrocuted. Raptor electrocution is, as the commenter notes, an issue with lower voltage sub-transmission and distribution lines where clearances are reduced. Wood poles are not as conductive as steel of course, but they are a ground and do not offer protection against electrocution.	Steven A. Goodroad
Electrical	All	General	Public	WAPA's proposed power line is in an area of very dry air subject to very high winds. The effects of positive static electricity generated by the lines on taller steel poles and how this energy may impact people and animals living near the new line was minimally considered, stating induced current and the electromagnetic field would be less than the existing transmission line. A supporting study for WAPA's assertions would be helpful in putting this concern to rest.	Western operates and maintains nearly 18,000 miles of transmission lines in all or parts of 15 western states, so the climatic conditions in this area are nothing unusual. Both wood and steel structures are properly grounded to carry lightning strikes or static charges safely to ground. Induced currents are unrelated to wind and weather, and are a function of the magnetic field of the operating line. Fences and other metal objects close to the line or in the ROW would be grounded appropriately to prevent induced currents. **Section 4.14** details the affects of EMF and other electrical effects. As previously noted, the new transmission line would produce less EMF at the edge of the ROW than the current transmission line. Additional supporting information and analysis is available in **Appendix D**.	Steven A. Goodroad
Proposed Project	All	General	Public	It is important to have a reliable power line and since WAPA is not increasing the power capacity of the transmission line, the existing design seems logical with the least impacts. Using the existing wood pole design also seem like it would be the most cost effective option.	The commenter's suggestion is not a viable option as a result of the short ruling span, fire risk, increased visual impact, and increased maintenance of the double-circuit 115-kV wood-pole H-frame structures. This option would be more expensive and more visually impacting than a single steel pole double-circuit alternative because both existing lines would have to be rebuilt, and no ROW would be abandoned. An underground option was not selected for the Agency Preferred Alternative - please see **Section 2.8** of the Final EIS for the rationale for selecting the Agency Preferred Alternative. Alternative D also has more visual and environmental impacts than the Agency Preferred Alternative.	Steven A. Goodroad

	Section of Route	Alternative	Public or Agency	Comment	Response	Author
Alternative		A2	Public	Form Letter - See comment letter 22 The Estes-Flatirons Rebuild will clearly advance our man-made amenities by making our electric power more reliable and fire resistant. The gains in this area, however, may or may not result in a loss of natural amenities. Through WAPA's current plans to consolidate the power lines, fewer intrusions on the natural beauty will occur. By burying the remaining power lines in the Estes Valley, no power lines or power poles will be visible. By following the path they have labeled Variant A2, the clear cutting associated with any of the methods can be moved farther from our transportation routes, residential communities, and recreational areas. Variant A2 gives us clear gains in man-made amenities and enhancements of our natural amenities as well. By taking this opportunity to add value to our community through both better man-made amenities and better display of our natural amenities, WAPA can add value to the Estes Valley in yet another way. The Estes Valley survives economically by hosting millions of guests who are visiting Rocky Mountain National Park. While these guests enjoy the beauty of our natural environment, our shop owners try to make their visits enjoyable, memorable, and restful. By contributing positively to the natural beauty of the Estes Valley, WAPA will contribute to our guests' experiences and to the economic health of the Estes Valley. This can best be accomplished by modernizing our electric transmission using Variant A2, as that minimizes the barriers to the natural beauty and the disruption of our neighborhoods. It seems fair that we citizens of the Estes Valley share with WAPA's other electric service recipients in the costs of having high quality electric service. It also seems fair that all of WAPA's customers share as equally as possible in minimizing the environmental costs of providing their service. By undergrounding the Estes-Flatirons transmission lines using Variant A2 and sharing that extra cost with all affected regional electric customers, WAPA can improve the nature experience of millions of Americans and treat the citizens of the Estes Valley equitably at a monthly cost per customers that is very low. In summary, I ask that you encourage WAPA to enhance the natural beauty of the Estes Valley, add to the economic health of the Estes Valley, and treat its regional customers fairly through embracing Variant A2. If Variant A2 is simply not possible, the next best method for accomplishing these goals is best through Alternative A.	Commenter correctly states that the proposed project would improve reliability and reduce risk of wildfire-relayed outages, but at the cost of some impact to environmental resources. Removal of one line and abandonment of the existing ROW would allow that line route to revert back to natural vegetation and eventually merge with the rest of the area, and that aspect of the proposed Project is thus a tangible improvement to the Estes Park vicinity. Other adjustments to the line route as included in the Agency Preferred Alternative would also reduce~~d~~ existing impacts, especially visual. Underground and overhead line construction are fully discussed in **Sections 2.2.2** and **2.2.4** of the Final EIS. **Section 2.8** of the Final EIS presents the rationale that led to the selection of the Agency Preferred Alternative. Western must carefully consider the costs of its projects, as all costs are recovered in the wholesale power rates it charges its utility customers, and not through tax dollars. In joint participation projects where Western partners with other utilities, the partners must recover their investment through their rates, typically retail rates to end users such as the residents of Estes Park. The costs of this Project would be similarly recovered and would be, therefore, similarly spread to ratepayers directly or indirectly.	Leanne Lauren
Alternative		General	Public	Duplicate of comment letter 20	Members of the Project team have been to the Meadowdale Hills subdivision, and have examined the route alternatives from the air. The subdivision is crossed by an existing transmission line, so any assessment of impact has to take that fact into account. Most alternatives include the complete removal of one of the existing lines and abandonment of the ROW, a net gain in visual resources to the Estes Park area.	Larry Olson
Alternative	West	General	Public	Is there any discussion of burying the lines..... From the Estes Park Power Plant east bound following US 36 across the lake to the Estes Park town city limit at (Mall Road) ? If so just that alone would be a huge improvement!!!! I would go steel from there...	While Western is aware of the desire to remove the steel lattice structures along the causeway, these structures are not included as part of the agency's present project scope. At some point in the future, when these structures are in need of replacement, undergrounding this section would very likely be considered.	Dave Ranglos

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Alternative		A2	Public	Form Letter - See comment letter 22 The Estes-Flatirons Rebuild will clearly advance our man-made amenities by making our electric power more reliable and fire resistant. The gains in this area, however, may or may not result in a loss of natural amenities. Through WAPA's current plans to consolidate the power lines, fewer intrusions on the natural beauty will occur. By burying the remaining power lines in the Estes Valley, no power lines or power poles will be visible. By following the path they have labeled Variant A2, the clear cutting associated with any of the methods can be moved farther from our transportation routes, residential communities, and recreational areas. Variant A2 gives us clear gains in man-made amenities and enhancements of our natural amenities as well. By taking this opportunity to add value to our community through both better man-made amenities and better display of our natural amenities, WAPA can add value to the Estes Valley in yet another way. The Estes Valley survives economically by hosting millions of guests who are visiting Rocky Mountain National Park. While these guests enjoy the beauty of our natural environment, our shop owners try to make their visits enjoyable, memorable, and restful. By contributing positively to the natural beauty of the Estes Valley, WAPA will contribute to our guests' experiences and to the economic health of the Estes Valley. This can best be accomplished by modernizing our electric transmission using Variant A2, as that minimizes the barriers to the natural beauty and the disruption of our neighborhoods. It seems fair that we citizens of the Estes Valley share with WAPA's other electric service recipients in the costs of having high quality electric service. It also seems fair that all of WAPA's customers share as equally as possible in minimizing the environmental costs of providing their service. By undergrounding the Estes-Flatirons transmission lines using Variant A2 and sharing that extra cost with all affected regional electric customers, WAPA can improve the nature experience of millions of Americans and treat the citizens of the Estes Valley equitably at a monthly cost per customers that is very low. In summary, I ask that you encourage WAPA to enhance the natural beauty of the Estes Valley, add to the economic health of the Estes Valley, and treat its regional customers fairly through embracing Variant A2. If Variant A2 is simply not possible, the next best method for accomplishing these goals is best through Alternative A.	Commenter correctly states that the proposed project would improve reliability and reduce risk of wildfire-relayed outages, but at the cost of some impact to environmental resources. Removal of one line and abandonment of the existing ROW would allow that line route to revert back to natural vegetation and eventually merge with the rest of the area, and that aspect of the proposed Project is thus a tangible improvement to the Estes Park vicinity. Other adjustments to the line route as included in the Agency Preferred Alternative would also reduce~~d~~ existing impacts, especially visual. Underground and overhead line construction are fully discussed in **Sections 2.2.2** and **2.2.4. Section 2.8** of the Final EIS presents the rationale that led to the selection of the Agency Preferred Alternative. Western must carefully consider the costs of its projects, as all costs are recovered in the wholesale power rates it charges its utility customers, and not through tax dollars. In joint participation projects where Western partners with other utilities, the partners must recover their investment through their rates, typically retail rates to end users such as the residents of Estes Park. The costs of this Project would be similarly recovered and would be, therefore, similarly spread to ratepayers directly or indirectly.	Lori Smith
Alternative	East	B	Public	Concerning the proposed power lines near Pinewood Reservoir, my husband and I would like to offer our preference for Alternative B. We are landowners in this area and feel that Alternative B is the best option both for us and for the majority of stakeholders living near Pinewood, as it doesn't cross smaller residential lots and maintains the current lines and easements that have been in place for decades. Alternatives C and D in particular may threaten our ability to build a home on our property, depending on the specific placement of towers. Alternative A is displeasing to many of our neighbors, who likewise would prefer not to have monopoles and structures on their land. In closing, we would like to state again our preference for Alternative B.	In this area, Alternative B has been selected as part of the Agency Preferred Alternative.	Alicia and Dillon Sprague
General	All		Public	First of all I would encourage Western Power to consider the Estes Flatiron project as the first step in an ongoing and larger engineering project, and plan not only for the current consolidation of the existing transmission system, but consider the impact of what we do today on future infrastructure projects.	Every transmission project is part of the larger interconnected power system, and each region has a 10-year construction plan, so Western does consider future infrastructure needs as it makes decisions on current construction projects. The rationale for selecting the Agency Preferred Alternative is presented in **Section 2.8** of the Final EIS.	Chip Sproul
Alternative	West	A	Public	Alternative A routes the project North of the Meadowdale Hills subdivision and along the existing North transmission line Right-Of –Way. The installation of a new six line system consisting of one hundred foot towers does not belong in a residential neighborhood negatively impacting over one hundred home owners. I am sure the money spent today to place power lines underground along the North route (Alternative A) will be appreciated not only in the short run by improving the views as you approach Estes Park and Rocky Mountain National Park, but also by succeeding generations of engineers planning the infrastructure for the second half of the twenty first century. In short, let's extend our Planning Horizon beyond today by undergrounding as much as possible and look forward to undergrounding the current structures along Lake Estes.	Western points out that the proposed Project is not a new project, but would replace two existing lines with one transmission line and abandon one entire existing ROW under most alternatives. As described in **Section 2.8** of the Final EIS, undergrounding transmission lines has its own set of issues and impacts that are very different than burying a distribution line. The rationale supporting the selection of the Agency Preferred Alternative is presented in **Section 2.8**.	Chip Sproul
Visual	West	General	Agency-Estes Valley Land Trust	EVLT very much supports the variant alternatives that reflect the burying of the transmission lines. In section 4.12.6 Mitigation, the DEJS states "The most effective mitigating strategy for scenic resources is proper siting and structure design." EVLT disagrees: rather the most effective long-term mitigation strategy for protection of the scenic resources of the Estes Valley is burial of the lines. EVLT recognizes the additional cost involved, but believes that over the long term, this is the most effective strategy and requests that the final EIS language reflect this comment. EVLT has long-term responsibilities to protect its easements, and indeed under federal and state law, those responsibilities are in perpetuity. We would like to see WAPA also take a long term perspective and bury the transmission line as shown in variants CI or A2.	An underground transmission line also requires a cleared ROW of, in this scenario, at least 50 feet. While an aboveground line requires structures and conductors, its ROW can contain shrubs and low-growing trees. Where spans cross draws and ravines there may be no clearing of vegetation at all save access to the structures themselves. An underground transmission line would require total clearance of woody vegetation across the entire ROW, for its entire length. The effects of the structures and conductors diminish in front-lit, side-lit, and back-lit lighting conditions; in background terrain situations; and with a relatively short distance. The ROW clearings typically cause visual impacts throughout each day that are greater than the effects of the structures. An underground line cleared ROW in forested landscapes could be more visible than an overhead line ROW, as the latter would have darker shrubs and low trees to blend with the surrounding vegetation. Individuals will have varying opinions about which ROW is less obtrusive to them, but Western believes that the completely cleared ROW needed for underground construction would result in negligible benefits in many areas, and would be worse in some.	Mary Banken

	Section of Route	Alternative	Public or Agency	Comment	Response	Author
Land Use and Recreation	West	B,D	Agency-Estes Valley Land Trust	Our second comment is that it is our understanding that the Right of Way owned by WAPA through the existing EVLT CE properties are 11 O' and that is the width required for alternatives B and D. In other words, EVLT understands that expansion of the RO W's through EVLT owned CE's for these alternatives would not occur, beyond that which existed at the time the easements were acquired. We requested a GIS data layer of the WAPA ROW at the open house on September 23rd to assist in the verification of the location of the ROW relative to EVLT's CE's (we have followed up this verbal request with emails to WAPA but have had no response). Our comments assume that the ROW's through EVLT's CE's would not be increased. EVLT would be opposed to any expansion from the existing ROW though its easements regardless of their current width if it is determined by WAPA that it is necessary to increase the width of these easements. Further, if any ground disturbance in EVLT CE's occurs with resulting soil disturbance, as indicated in the DEIS, EVLT would expect that the original topography and condition be reestablished and the disturbed areas restored.	Western has provided the requested GIS data layer. Where Western has existing ROW of 110 feet (the 'South Route'), no additional ROW would be required. Reclamation of construction disturbance is discussed in **Sections 4.4** and **4.7** of the Final EIS.	Mary Banken
General	West		Public	Quite simply, you have before you the once-in-a-lifetime opportunity to make a significant positive impact on the beauty, economy, health and legacy of Estes Valley and its residents and visitors. This is not a responsibility to be taken lightly or based on a single consideration.	Western has a large number of considerations it needs to factor into a decision on the proposed Project. The rationale used to determine the Agency Preferred Alternative is presented in **Section 2.8** of the Final EIS.	Rich and Joy Harvey
Alternative		General	Public	We strongly encourage WAPA and the Estes Park and Estes Valley leaders to seriously consider the underground options for new transmission lines.	Underground construction was considered in two options near the west end of the proposed project. The issues and impacts associated with underground construction are presented in **Section 2.2.4** of the Final EIS, and the rationale used to determine the Agency Preferred Alternative is presented in **Section 2.8**.	Rich and Joy Harvey
Visual	West	General	Public	WAPA's proposed above ground alternatives for the Estes to Flatiron Transmission Lines rebuild project while decreasing the number of poles would increase the number of lines carried by each pole, the power carried by each line, as well as significantly increasing the height of the poles and lines. For some this may raise the lines above their line of sight but for many others this would extend the lines and poles directly into their now beautiful view. The existing power lines and poles currently in place on the Lake Estes causeway are a constant reminder of the negative impact a good project can have if the implementation is less than wise. This is our chance to correct that negative impact.	While most alternatives considered would indeed include double-circuit, taller steel structures, those alternatives would also include the removal of the other existing line and abandonment of that ROW, which would have substantial beneficial visual effects as compared to the existing conditions. Western is well aware that the removal of the lattice steel structures along the causeway would greatly improve the visual situation coming into Estes Park, but that segment is not included in the proposed Project and is beyond the scope of the EIS.	Rich and Joy Harvey
Land Use and Recreation		General	Public	Our expectation and that of many Estes Valley residents is that this project would be consistent with the Vision, Mission and Goals of Estes Park, i.e., the 2014 Strategic Plan for Estes Park. The town Vision: "The Town of Estes Park will enhance our position as a premier mountain community." When arriving in Estes Park via Highway 36 the immediate view of massive transmission poles and lines does not bring to mind "a premier mountain community." On the contrary, it causes one to think, "How did this happen?" "The Mission of the Town of Estes Park is to provide high-quality, reliable services for the benefit of our citizens, guests, and employees while being good stewards of public resources and our natural setting." How is the placement of new above ground transmission lines consistent with "...being good stewards of public resources and our natural setting."? The Key Outcomes, Goals and Board Objectives of this 2014 Strategic Plan are not consistent with the projected impacts of new above-ground transmission lines. New construction projects and extensive remodels within Estes Valley are required to place utility lines underground. How is it that WAPA and the Estes to Flatiron project is exempted from this requirement???	The proposed Project is not a 'new transmission line'. It is a rebuild and consolidation of two existing lines that have been part of the local landscape for over 60 years. Further, the Agency Preferred Alternative results in the consolidation of both lines into one, allowing the removal of one line and abandonment of the ROW so that 16 miles of existing ROW can be allowed to revert to nature. The trade-off is taller structures on the remaining existing ROW.	Rich and Joy Harvey
Socioeconomics	West	General	Public	There is no argument that the proposed power lines/poles would negatively impact our land values. WAPA has estimated a decrease in value to individual properties of between 10% and 30%. (Of course, it is in their best interest to minimize the estimate of negative impacts.) How can the community leaders condone this loss or any loss to property values? A very experienced realtor with an investment in the welfare of the local community has predicted a much higher loss to our land values. Would it not be in the best interest of the entire Estes Valley community to mitigate this negative impact??	Commenter may well be correct that proximity to a transmission line and EMF source may cause a potential buyer to not purchase a particular property. However, property valuations are based on actual property transactions, and most studies done on transmission lines and property values largely show no or minor negative impacts to property values, and that any impacts tend to diminish over a few years. What the studies indicate is that while some people may object to the presence of a transmission line, there are still enough ready buyers that property values are not greatly affected, and the longer a line is present the more it becomes part of the backgrounds, and the less of a factor it is. Western also notes that these studies look at the impact of a new transmission line on property values, and not an upgrade of an existing line, where valuation considerations would be expected to be embedded in the present value of the property, and the presence of a line has been accepted. please see **Section 4.13** for a more detailed discussion. As detailed in **Section 2.2.2**, shorter average height structures with a shorter span length could be considered in sensitive communities; however, the tradeoff for somewhat shorter structures is shorter spans and more structures. As visual impacts are subjective and vary by viewer, some would prefer taller, fewer structures, and others shorter but more numerous structures.	Rich and Joy Harvey
General	West		Public	The WAPA representatives at the most recent open house held here in Estes Park on October 30, 2014 referenced a "not in my back yard" attitude expressed by those residents who would be directly impacted by the proposed alternative routes for the transmission lines. What we heard from those concerned citizens who took the time and effort to speak publicly was a much broader more global concern for the future of Estes Valley's health and welfare. Is not the Estes Valley all our backyards? And yes, we all have an obligation to protect our 'backyard' and those of our neighbors.	There are many considerations Western must take into account for a project of this type, including those raised by local residents, those imposed by law and regulations, those associated with the agency's mission, and the realities of the physical and human environment. Western must seek to balance many competing, conflicting, and sometimes mutually exclusive factors in order to arrive at a decision.	Rich and Joy Harvey

	Section of Route	Alternative	Public or Agency	Comment	Response	Author
Alternative, Visual, Electrical	West	General	Public	You are aware of the many benefits of underground transmission line installation as it relates to protection from wildfire, protection of the views and decreased exposure to electromagnetic fields. These positive effects should not be underestimated. A most insightful paper, Underground Electric Transmission Lines, submitted by the Public Service Commission of Wisconsin is available on the WAPA web site @ ww2.wapa.gov. We highly encourage you to read it. The Underground Electric Transmission Lines paper submitted by the Public Service Commission of Wisconsin provides valuable information regarding the impact of underground lines both pro and con. However, what may be a negative for one community may not be the same for Estes Park and Estes Valley. The impact of an underground line on the environment is less than the lifetime scar of a 300 foot clear-cut right of way for an above ground transmission line. The significant impact of placing transmission lines underground is the economic cost. The residents of Estes Valley understand that. What is somewhat more difficult to measure is the value of the benefits such as: improvement in visual impact, the improved health benefits by reducing the effect of the electromagnetic field, the reduced loss in land values, the increased appeal of the Town of Estes and the Estes Valley to the many visitors who support our economy, and the legacy that will be left behind for future generations to experience and emulate. How do you weigh these benefits against the economic cost of the underground alternative? The answer must come from those who will carry that responsibility, the residents of the Estes Valley and those who will benefit from improved electric power.	Underground transmission lines typically have shielded electric fields, but higher magnetic fields than overhead lines because the conductors are closer to the ground surface. Western is familiar with the Wisconsin publication, which as the commenter notes is available on our web site. Commenter is incorrect that the cleared ROW would be 300 feet; Western would use a 110-foot-wide ROW, which the present 'South Route' already has. It should also be noted that shrubs and small trees would be allowed to grow across an above-ground line ROW, while an underground line would require a completely cleared 50-foot strip directly above the buried lines. This comment illustrates some of the many factors and effects, some measurable and some very subjective, that must be considered in order to make an informed decision. The rationale used to support the identification of the Agency Preferred Alternative is presented in **Section 2.8** of the Final EIS.	Rich and Joy Harvey
General	West		Public	If you are to listen and really hear those giving input there is a tremendous amount of support by neighbors and customers of power carried by these lines to share that economic responsibility. Spread over the many consumers and the years of service the responsibility in the opinion of many is worth sharing and more than worth the cost. Many individual landowners who will be directly affected have voiced their willingness to support an impact to their land that will support such an overall beneficial outcome for the Estes community. Is not the support of the community in the form of positive public opinion and a willingness to support this project both morally and economically worth its weight in gold? In the words of a long time resident and very wise woman, 'Let's do it right this time." This outcome is indeed truly priceless.	Western appreciates the comments and concerns voiced by the public; a fundamental goal of the NEPA process is to elicit public participation and input, and to use the results of that participation to make informed agency decisions. The discussion of the rationale used to support the selection of an Agency Preferred Alternative clearly reflects this input, although inevitably not everyone will be satisfied. The elimination of one of the existing lines and abandonment of the ROW to be reclaimed by nature would provide a substantial benefit to the area, a fact that has been largely overlooked.	Rich and Joy Harvey
Alternative		A2	Public	Form Letter - See comment letter 22 The Estes-Flatirons Rebuild will clearly advance our man-made amenities by making our electric power more reliable and fire resistant. The gains in this area, however, may or may not result in a loss of natural amenities. Through WAPA's current plans to consolidate the power lines, fewer intrusions on the natural beauty will occur. By burying the remaining power lines in the Estes Valley, no power lines or power poles will be visible. By following the path they have labeled Variant A2, the clear cutting associated with any of the methods can be moved farther from our transportation routes, residential communities, and recreational areas. Variant A2 gives us clear gains in man-made amenities and enhancements of our natural amenities as well. By taking this opportunity to add value to our community through both better man-made amenities and better display of our natural amenities, WAPA can add value to the Estes Valley in yet another way. The Estes Valley survives economically by hosting millions of guests who are visiting Rocky Mountain National Park. While these guests enjoy the beauty of our natural environment, our shop owners try to make their visits enjoyable, memorable, and restful. By contributing positively to the natural beauty of the Estes Valley, WAPA will contribute to our guests' experiences and to the economic health of the Estes Valley. This can best be accomplished by modernizing our electric transmission using Variant A2, as that minimizes the barriers to the natural beauty and the disruption of our neighborhoods. It seems fair that we citizens of the Estes Valley share with WAPA's other electric service recipients in the costs of having high quality electric service. It also seems fair that all of WAPA's customers share as equally as possible in minimizing the environmental costs of providing their service. By undergrounding the Estes-Flatirons transmission lines using Variant A2 and sharing that extra cost with all affected regional electric customers, WAPA can improve the nature experience of millions of Americans and treat the citizens of the Estes Valley equitably at a monthly cost per customers that is very low. In summary, I ask that you encourage WAPA to enhance the natural beauty of the Estes Valley, add to the economic health of the Estes Valley, and treat its regional customers fairly through embracing Variant A2. If Variant A2 is simply not possible, the next best method for accomplishing these goals is best through Alternative A.	Commenter correctly states that the proposed project would improve reliability and reduce risk of wildfire-relayed outages, but at the cost of some impact to environmental resources. Removal of one line and abandonment of the existing ROW would allow that line route to revert back to natural vegetation and eventually merge with the rest of the area, and that aspect of the proposed Project is thus a tangible improvement to the Estes Park vicinity. Other adjustments to the line route as included in the Agency Preferred Alternative would also reduce~~d~~ existing impacts, especially visual. Underground and overhead line construction are fully discussed in **Sections 2.2.2** and **2.2.4**. **Section 2.8** of the Final EIS presents the rationale that led to the selection of the Agency Preferred Alternative. Western must carefully consider the costs of its projects, as all costs are recovered in the wholesale power rates it charges its utility customers, and not through tax dollars. In joint participation projects where Western partners with other utilities, the partners must recover their investment through their rates, typically retail rates to end users such as the residents of Estes Park. The costs of this Project would be similarly recovered and would be, therefore, similarly spread to ratepayers directly or indirectly.	Robert (Butch) and Leah Lundstedt

	Section of Route	Alternative	Public or Agency	Comment	Response	Author
Visual	West	General	Public	Although the Rebuild Project will make our electric power more reliable and fire resistant, placing the Towers above ground along Highway 36 and through the Meadowdale Hills neighborhood will significantly diminish the pristine and scenic nature of the entire Estes Valley. Highway 36 is the gateway to the town of Estes and Hermit Park and provides a first impression to the thousands of visitors who travel there to escape the undesireable characteristics of urban living.	Western took the visual aspect of the proposed Project into account, as evidenced by the selection of the Agency Preferred Alternative and its supporting rationale, and the proposed removal of the structures presently adjacent to Highway 36.	Bill & Sue Oakes
Alternative	West	General	Public	The best way to contribute to the natural beauty of the Estes Valley and to the economic impact that tourism provides, is to underground the transmission lines and allocate the additional cost among all of the affected regional electric customers. If placing the lines underground simply cannot be done, then the other best alternative is to run them through the mostly uninhabited Crocker Ranch. With all due respect for the work that has been done to enhance the power system in the Estes Park area, we urge WAPA to either underground the transmission lines or place the towers through Crocker Ranch, out of sight of those who visit Estes Park and contribute to the economic success of the entire Estes Valley.	The selection of the Agency Preferred Alternative took into account many factors, and necessitated several resource trade-offs. The rationale for the selection of the Agency Preferred Alternative is presented in **Section 2.8** of the Final EIS. All alternatives cross the Crocker Ranch, as they have been since being identified. This is not a new project, and involves rebuilding lines that have been present in the area for many decades. Additionally, all alternatives except D and No Action would remove one entire existing line and the ROW would be abandoned. This would improve the present visual impacts.	Bill & Sue Oakes
Socioeconomics	West	General	Public	I realize from all that has been written about this project that there is much to gain in "creature comforts" by this Estes-Flatirons Rebuild. With the knowledge that we now have, the technology available, and the backing of the residents of the Estes Valley, it seems like the perfect opportunity to make a change that will be valued now and for generations to come. It seems fair that we citizens of the Estes Valley share with WAPA's other electric service recipients in the costs of having high quality electric service. It also seems fair that all of WAPA's customers share as equally as possible in minimizing the environmental costs of providing their service. By undergrounding the Estes-Flatirons transmission lines using Variant A2 and sharing that extra cost with all affected regional electric customers, WAPA can improve the nature experience of millions of Americans and treat the citizens of the Estes Valley equitably at a monthly cost per customers that is very low.	The rationale discussed in **Section 2.8** of the Final EIS provides a review of the many factors Western must consider when making a decision on the proposed Project. Visual concerns are just one of those factors, and Western must again point out that this is not a new transmission line, but a replacement project for two existing lines that have been in place for over 60 years. The Agency Preferred Alternative would result in the removal of one line and abandonment of its ROW, which would revert back to its natural state within a few years and represent a substantial visual improvement over the present condition. As a responsible Federal agency, Western must also consider cost in its decisions, both construction and operations and maintenance costs.	Paulette Robles
Land Use and Recreation	East	General	Public	Table 3.113 has incorrect information in it. I believe the information for Pinewood Reservoir County Park should be updated based on the changes the County is making that are scheduled to be completed next spring. They are in the process of adding additional campsites and have completed an additional mile of trail along CR18E. The trail mileage would be closer to 5 miles rather than the 4 stated in the table. I am not sure what the final newly enlarged campground count will be, but it will be greater than what is also stated in the table.	**Table 3.11-3** has been updated with the latest possible information regarding Pinewood Reservoir County Park.	Barbara Sax
Land Use and Recreation	East	General	Public	Table 3.111 has incorrect information in it. It does not appear you included the lower portion of Green Mountain Drive or all of the homes on Newell Dr in the Newell Lake View Subdivision numbers based on the map on page 383. I believe they should have been included somewhere as current lines run by some of the houses and everyone walks and drives the same roads. I included homes on Green Mountain Dr, Greenwood Dr, Sylvia Ct, Newell Dr, and CR 18E (between Green Mountain Dr & Greenwood on the East side of the lake. ● I believe the Estimated Undeveloped Lots is less than the 7 indicated in the table ● Developed Lots is closer to 63 ● Total Residential is closer to 62. The location is directly East of Pinewood Reservoir not the North. (Please look at your maps as the community runs directly east of the entire length on the lake.)	The Larimer County Assessor has been consulted again to ensure that the most current and up to date Newell Lake View Subdivision information has been incorporated into **Section 3.11**. Portions of the roads and adjacent residences mentioned in the comment are outside the boundaries of the Newell Lake View Subdivision and are not included within the subdivision tally. Text has been added in the section acknowledging these properties.	Barbara Sax
Visual	East	General	Public	I have two main goals that I have listed in the order of importance 1. keep Transmission Lines from running across any of the Newell Lake View Area properties. 2. protect the viewshed of Pinewood Lake My main issue with the Draft is that it does not adequately address the goal of protecting the viewshed of Pinewood Lake. The draft recognizes that there is a sensitivity to the viewshed of Pinewood Lake and Alternative A was added to address those, but several inaccurate statements have been made. I question the accuracy of this statement in regards to Alternative C.	Visual impacts are just one of the many potential environmental impacts and other factors Western must consider, and we acknowledge it as being an important one. Removal of the portion of the existing transmission line across the Newell Lake View Subdivision is and has been a component of every alternative, including No Action, since the beginning of the process due to encroachment and safety concerns.	Barbara Sax

	Section of Route	Alternative	Public or Agency	Comment	Response	Author
Visual	East	A, C, D	Public	Page S13& 241 "Several alternatives, specifically Alternatives A and C, avoid the viewshed south of Pinewood Lake, providing an alternative that eliminates these impacts at a much lower cost." Alternative C does not avoid the viewshed issue. As shown in figure 3.126 & 3.127 of the Draft, Alternative C clearly falls into both the Recreational and Residential Viewsheds. It runs by a number of houses along CR 18 E obstructing the view of the Newell Lakeview Subdivision and close to the new trail segment on the other side of CR 18E. Alternative D also has the same issue. This statement has been used throughout the Draft as a reason not to pursue a number of other alternatives, such as other Northern paths, like Cottonwood Creek. The fact is we do not have several alternatives as stated in the draft, that address the Pinewood Lake viewshed issue. We only have one Alternative A.	Commenter is correct, Alternative C is within the viewshed of Pinewood Reservoir (lake), and the text in the Executive Summary and **Section 2.9** have been adjusted to reflect this. Alternative B has been selected as part of the Agency Preferred Alternative in this area.	Barbara Sax
Visual	East	A & C	Public	Also when I read the draft I got the impression that our original comments made at the community brainstorming session at the Bison Center, and the statements sent to you following the last review period have been understated or largely ignored in the draft, as a number of residents commented that they were concerned with the larger transmission lines impacting their view of the Pinewood Lake area. Since the major subdivision that looks at the lake is named the Newell Lake View Subdivision, the view of the area around the lake is obviously of great concern. I agree that Alternative A protects the viewshed, but the draft's statement that Alternative C eliminates the viewshed concern is not correct and I feel it may have adversely affected the methodology in coming up with Pinewood Lake viewshed alternatives.	The text in the Executive Summary and **Section 2.9** have been corrected based on the viewshed of Alternative C. Alternative B has been selected as part of the Agency Preferred Alternative in this area.	Barbara Sax
Proposed Project, economic, visual	East	A	Public	Extra costs associated with protecting the Pinewood Lake viewshed for generations of users to come are justified to maintain the rustic nature of the area. The additional costs depreciated over the life of the next transmission lines greatly reduces any financial impact.	Both costs and visual impacts have been considered in the selection of the Agency Preferred Alternative. Please see **Section 2.8** of the Final EIS for a discussion of the rationale for selecting this alternative.	Barbara Sax
Alternative	East	A	Public	Although I like the concept of choosing a path north of the dam on Pinewood Lake I have to question the methodology used in selecting the route chosen in Alternative A. The route goes very close to many of the homes on the Northern Boundary of the Newell Lakeview Area. Faced with a choice between protecting a viewshed they value or having lines run through their property close to their homes, homeowners will willingly give up pursuit of protecting the viewshed. By routing alternative A close to homes in the Newell Lakeview Area you have divided the community. The homeowners affected have aggressively recruited neighbors to support their cause to choose Alternative B to prevent this from happening, skewing comments you will receive away from protecting the lakeview to protecting their neighbors.	Alternative A was identified during public routing workshops, and Western was asked to evaluate it. The route shown on the maps was conceptual only, and not intended to represent a final centerline. We have heard from residents supporting Alternative A, and others who oppose it. In the end, weighing all of the factors Western must consider led to the selection of Alternative B as part of the Agency Preferred Alternative. Please see **Section 2.8** of the Final EIS for a more detailed discussion.	Barbara Sax
Alternative	East	A	Public	I question how homeowners would have responded if Alternative A had just been placed just a ⅓ of a mile north of the existing route so that it ran more through the burned area and not through the Newell Lakeview Area properties. I believe there needs to be a revision to the existing Alternative A. This should be expected when a new proposal is placed into the draft. The newly revised Alternative A should run north of the Newell Lakeview Area community, which consists of approximately 216 acres in size and is the highest populated area on the east side of the project, and instead be focused to minimize the impact on homeowners. There are many acres of burned land and vacant properties that would make a much more viable alternative to homeowners. Perhaps there are even property owners who would welcome the compensation they would receive with new ROWs.	Alternative A was identified during public routing workshops, and Western was asked to evaluate it. The route shown on the maps was conceptual only, and not intended to represent a final centerline. Several serious issues were identified with any route in this area, including access, steep slopes, and constructability, among others. We have heard from residents supporting Alternative A, and others who oppose it. In the end, weighing all of the factors Western must consider led to the selection of Alternative B as part of the Agency Preferred Alternative. Please see **Section 2.8** of the Final EIS for a more detailed discussion.	Barbara Sax
Wildlife	East	B	Public	In addition to the major concern on the viewshed for the Pinewood Lake area by the Newell Lakeview Area residents, the ranch residents and the visitors to Pinewood Lake area, I am concerned about the impact on elk migration, nesting ospreys, and the broadcasting of internet and phone services to the Newell Lakeview area residents.	Impacts to elk and other big game species were are analyzed in **Sections 4.9.5.1** and **4.9.5.2** of the Draft EIS. Based on the project-specific design criteria for avian wildlife (**Section 2.5.1**), breeding raptors would not be impacted by these alternatives. Concerns about communication services are addressed in **Section 4.14**.	Barbara Sax
General	East	General	Public	I believe it would have been quite easy to have drafted a "Protect the Viewshed on Pinewood Lake document" based on what I have previously stated to collect hundreds of signatures from individuals who recreate in the Pinewood Lake area, by visiting campgrounds, fishing areas, and libraries, to oppose placing transmission lines as outlined in Options B, C or D. I have refrained from doing that based on the comments provided on The Dropin Learning Session Fact Sheet which states "NEPA isn't a voting exercise don't simply provide an expression of preference for one alternative versus another." I agree with your statement for many reasons. Please do not give credit to others who have collected signatures.	Thank you for your comment. Western included the quoted statement deliberately in an effort to obtain feedback on *why* members of the public liked or did not like certain aspects of the proposed Project, and elicit thoughts about how issues could be mitigated or resolved, allowing Western to respond more meaningfully.	Barbara Sax

	Section of Route	Alternative	Public or Agency	Comment	Response	Author
Visual	All	General	Public	The anodized Silver poles look better against the sky, rock, grass and the lake and should be the color of choice.	Western considered both galvanized steel 'silver' monopoles and self-weathering steel 'brown' monopoles (see comparison in Section 4.12). The USFS Landscape Architect concurs with the commenter's assessment; a mix of both steel types may be used depending on setting. There are supporters of both types, further proof that visual impacts are very subjective and highly variable (see comparison in Section 4.12). However, the latest field experience information from the utility industry on self-weathering structures indicates that ongoing corrosion weakens these structures, therefore shortening their expected service life. For this reason, and the fact the Forest Service prefers dull galvanized steel, self-weathering steel structures would not be used for this project.	Barbara Sax
Alternative	East	C & D	Public	Alternative C or D should not be selected as the lots are smaller and they impact many homeowners along CR 18E next to Pinewood Lake as well as the viewshed of the Newell Lakeview Area residents higher on the mountain and the recreational areas of the Lake. In addition they threaten the historic school house on the SE side of the lake.	Alternative B was selected for the Agency Preferred Alternative in this area.	Barbara Sax
Alternative	East	B	Public	Alternative B should not be selected as it has a major impact on the viewshed of the Pinewood Lake Recreation area and the residential areas of the Newell Lake Subdivision and the ranches on the West side of the lake.	Thank you for your comment. Please see **Section 2.8** for a discussion of the rationale used to arrive at a decision on the Agency Preferred Alternative. Alternative B was selected to be a part of the Agency Preferred Alternative in this area.	Barbara Sax
Alternative, Visual	East	A	Public	The draft does not adequately address the Pinewood Lake viewshed concerns brought up in previous sessions. Alternative A should be modified by taking a more northerly route that does not go through the heavily populated Newell Lakeview Area and strives to minimize impact on homeowners by routing through burned and unoccupied land. Other options to minimize the Pinewood Lake viewshed concerns should also be presented, as the one alternative (which is not even supported by the community it is meant to help) is not enough.	Thank you for your comment. Please see **Section 2.8** for a discussion of the rationale used to arrive at a decision on the Agency Preferred Alternative. Alternative A was identified during public routing workshops, and Western was asked to evaluate it. The route shown on the maps was conceptual only, and not intended to represent a final centerline. Weighing all of the factors Western must consider led to the selection of Alternative B as part of the Agency Preferred Alternative. Please see **Section 2.8** of the Final EIS for a more detailed discussion.	Barbara Sax
Alternative	East	A	Public	The Newell Lakeview Area has the largest population (approx 116) on the East side of the project. The only solution that we could all totally embrace is one where no Transmission Lines run through the community and the Pinewood Lake viewshed is protected. This aligns with the the opinions of those recreating on Pinewood Lake who would not want to see transmission lines run by the trails, lake, or campground as presented in option B,C or D. So far, the only solution presented needs to be revised by considering a more carefully thought out rerouting of Alternative A.	Thank you for your comment. Please see **Section 2.8** for a discussion of the rationale used to arrive at a decision on the Agency Preferred Alternative. Alternative A was identified during public routing workshops, and Western was asked to evaluate it. The route shown on the maps was conceptual only, and not intended to represent a final centerline. Weighing all of the factors Western must consider led to the selection of Alternative B as part of the Agency Preferred Alternative. Please see **Section 2.8** of the Final EIS for a more detailed discussion.	Barbara Sax
Alternative		General	Public	Duplcate to comment letter 22 The Estes-Flatirons Rebuild will clearly advance our man-made amenities by making our electric power more reliable and fire resistant. The gains in this area, however, may or may not result in a loss of natural amenities. Through WAPA's current plans to consolidate the power lines, fewer intrusions on the natural beauty will occur. By burying the remaining power lines in the Estes Valley, no power lines or power poles will be visible. By following the path they have labeled Variant A2, the clear cutting associated with any of the methods can be moved farther from our transportation routes, residential communities, and recreational areas. Variant A2 gives us clear gains in man-made amenities and enhancements of our natural amenities as well. By taking this opportunity to add value to our community through both better man-made amenities and better display of our natural amenities, WAPA can add value to the Estes Valley in yet another way. The Estes Valley survives economically by hosting millions of guests who are visiting Rocky Mountain National Park. While these guests enjoy the beauty of our natural environment, our shop owners try to make their visits enjoyable, memorable, and restful. By contributing positively to the natural beauty of the Estes Valley, WAPA will contribute to our guests' experiences and to the economic health of the Estes Valley. This can best be accomplished by modernizing our electric transmission using Variant A2, as that minimizes the barriers to the natural beauty and the disruption of our neighborhoods. It seems fair that we citizens of the Estes Valley share with WAPA's other electric service recipients in the costs of having high quality electric service. It also seems fair that all of WAPA's customers share as equally as possible in minimizing the environmental costs of providing their service. By undergrounding the Estes-Flatirons transmission lines using Variant A2 and sharing that extra cost with all affected regional electric customers, WAPA can improve the nature experience of millions of Americans and treat the citizens of the Estes Valley equitably at a monthly cost per customers that is very low. In summary, I ask that you encourage WAPA to enhance the natural beauty of the Estes Valley, add to the economic health of the Estes Valley, and treat its regional customers fairly through embracing Variant A2. If Variant A2 is simply not possible, the next best method for accomplishing these goals is best through Alternative A.	Commenter correctly states that the proposed Project would improve reliability and reduce risk of wildfire-relayed outages, but at the cost of some impact to environmental resources. Removal of one line and abandonment of the existing ROW would allow that line route to revert back to natural vegetation and eventually merge with the rest of the area, and that aspect of the proposed Project is thus a tangible improvement to the Estes Park vicinity. Other adjustments to the line route as included in the Agency Preferred Alternative would also reduce~~d~~ existing impacts, especially visual. Underground and overhead constriction are fully discussed in **Sections 2.2.2** and **2.2.4. Section 2.8** presents the rationale that led to the selection of the Agency Preferred Alternative. Western must carefully consider the costs of its projects, as all costs are recovered in the wholesale power rates it charges its utility customers, and not through tax dollars. In joint participation projects where Western partners with other utilities, the partners must recover their investment through their rates, typically retail rates to end users such as the residents of Estes Park. The costs of this Project would be similarly recovered and would be, therefore, similarly spread to ratepayers directly or indirectly.	Mike Sax

	Section of Route	Alternative	Public or Agency	Comment	Response	Author
Alternative	West	A	Public	We are supporting Alternative A for the following reasons: Our current property, located in Ravencrest Estates, has a land easement that provides for a 55 feet on either side of the current transmission centerline. Alternative A would remove this proposed transmission line from our property, and the proposed 105 feet steel monopoles that would wheel 230 kilovolts of electricity close to our home. We are very concerned about this health risk. We have not seen nor been provided with any new information from Western Area Power Administration ("WAPA") that 230 kilovolts of electricity close to a residential home does not cause or create any health concerns from these additional Electromagnetic Fields ("EMFs"). Even the NIHS booklet dated April 4, 1999 provided by WAPA, states that EMF exposure can't be recognized as entirely safe. Since the data on EMF's have not been conclusive, it would be prudent for WAPA to avoid this health risk. Alternative A would solve this issue for us and our neighbors. WAPA would also save millions of dollars in litigation costs due to significant health effects. By removing this line from our property and others, the proposed transmission line would be consolidated with the existing North Transmission Line ROW on the Western side, where no residential homes nor farms are located.	**Section 4.14** of the Final EIS discusses EMF and potential health risk issues. Additionally, **Tables 4.14-1** and **4.14-2** portray the estimated differences in EMF from the proposed new structures and the current H-frame structures. The new line, like the old ones, would be operated at 115-kV, and would have lower EMF than the existing line due to higher conductor clearances and the cancellation effects of a double-circuit line. Voltages are not additive as the commenter suggests. The rationale supporting the selection of the Agency Preferred Alternative is provided in **Section 2.8** of the Final EIS.	Reggie and Mary Elizabeth Smith
Alternative	West	A	Public	Alternative A would also eliminate all the current transmission lines along Route 36, which would significantly improve the visual impact for visitors coming to Estes Park. A vista clear of power lines would have tremendous economic benefit for Estes Park and Larimer County tourism.	Western notes that consolidation of the two existing lines on one ROW allows the removal of the existing line and abandonment of the other ROW, allowing that ROW to revert to natural conditions and lessening the visual impact. The rationale supporting the selection of the Agency Preferred Alternative is provided in **Section 2.8** of the Final EIS.	Reggie and Mary Elizabeth Smith
Alternative	West	A	Public	Property values for the homeowners close to the transmission line would also be negatively impacted if Alternative A is not implemented on the Western side. These large monopoles will decrease property values by more than 30%. Lower property values will also mean lower tax revenues for Larimer County and a reduction in new home construction as fewer people would be willing to move to this area. People do not want to live near steel monopoles as described in the EIS.	Please refer to the discussion of property valuation in **Section 4.13** of the Final EIS. Commenter may well be correct that proximity to a transmission line and EMF source may cause a potential buyer to not purchase a particular property. However, property valuations are based on actual property transactions, and most studies done on transmission lines and property values largely show no or minor negative impacts to property values, and that any impacts tend to diminish over a few years. What the studies indicate is that while some people may object to the presence of a transmission line, there are still enough ready buyers that property values are not greatly affected, and the longer a line is present the more it becomes part of the backgrounds, and the less of a factor it is. Western also notes that these studies look at the impact of a new transmission line on property values, and not an upgrade of an existing line, where valuation considerations would be expected to be embedded in the present value of the property, and the presence of a line has been accepted; please see **Section 4.13** for a more detailed discussion. As detailed in **Section 2.2.2**, shorter average height structures with a shorter span length could be considered in sensitive communities; however, the tradeoff for somewhat shorter structures is shorter spans and more structures. As visual impacts are subjective and vary by viewer, some would prefer taller, fewer structures, and others shorter but more numerous structures.	Reggie and Mary Elizabeth Smith
Alternative	All	A	Public	From a cost point of view, Alternative A has the second lowest life cycle cost of $22.6 million, a difference of only $500,000 over the lowest cost alternative. The difference of $500,000 is marginal when amortized over 80 years. That difference amounts to only $6,250 per year.	Thank you for your comment. Cost, while important, is just one of many factors considered when making a decision on a project such as this.	Reggie and Mary Elizabeth Smith
Alternative	All	A2	Public	We would also support Alternative A Variant A-2 as the power lines would be underground and the electric fields at the ROW would be at zero kilovolts.	Electric fields are measured in Volts per meter, and as the commenter notes would be zero at the ground surface. These fields from overhead lines are also easily shielded by vegetation and buildings. No potential associations between electric fields and suspected human health issues have been identified. Magnetic fields are measured in milligauss, and buried transmission lines would likely result in higher exposure at ground level than from overhead lines, because magnetic fields are not shielded by burial. Exposure is solely a function of distance from the energized conductor.	Reggie and Mary Elizabeth Smith

	Section of Route	Alternative	Public or Agency	Comment	Response	Author
Alternative		A2	Public	Form Letter - See comment letter 22 The Estes-Flatirons Rebuild will clearly advance our man-made amenities by making our electric power more reliable and fire resistant. The gains in this area, however, may or may not result in a loss of natural amenities. Through WAPA's current plans to consolidate the power lines, fewer intrusions on the natural beauty will occur. By burying the remaining power lines in the Estes Valley, no power lines or power poles will be visible. By following the path they have labeled Variant A2, the clear cutting associated with any of the methods can be moved farther from our transportation routes, residential communities, and recreational areas. Variant A2 gives us clear gains in man-made amenities and enhancements of our natural amenities as well. By taking this opportunity to add value to our community through both better man-made amenities and better display of our natural amenities, WAPA can add value to the Estes Valley in yet another way. The Estes Valley survives economically by hosting millions of guests who are visiting Rocky Mountain National Park. While these guests enjoy the beauty of our natural environment, our shop owners try to make their visits enjoyable, memorable, and restful. By contributing positively to the natural beauty of the Estes Valley, WAPA will contribute to our guests' experiences and to the economic health of the Estes Valley. This can best be accomplished by modernizing our electric transmission using Variant A2, as that minimizes the barriers to the natural beauty and the disruption of our neighborhoods. It seems fair that we citizens of the Estes Valley share with WAPA's other electric service recipients in the costs of having high quality electric service. It also seems fair that all of WAPA's customers share as equally as possible in minimizing the environmental costs of providing their service. By undergrounding the Estes-Flatirons transmission lines using Variant A2 and sharing that extra cost with all affected regional electric customers, WAPA can improve the nature experience of millions of Americans and treat the citizens of the Estes Valley equitably at a monthly cost per customers that is very low. In summary, I ask that you encourage WAPA to enhance the natural beauty of the Estes Valley, add to the economic health of the Estes Valley, and treat its regional customers fairly through embracing Variant A2. If Variant A2 is simply not possible, the next best method for accomplishing these goals is best through Alternative A.	Commenter correctly states that the proposed project would improve reliability and reduce risk of wildfire-relayed outages, but at the cost of some impact to environmental resources. Removal of one line and abandonment of the existing ROW would allow that line route to revert back to natural vegetation and eventually merge with the rest of the area, and that aspect of the proposed Project is thus a tangible improvement to the Estes Park vicinity. Other adjustments to the line route as included in the Agency Preferred Alternative would also reduce~~d~~ existing impacts, especially visual. Underground and overhead line construction are fully discussed in **Sections 2.2.2** and **2.2.4. Section 2.8** presents the rationale that led to the selection of the Agency Preferred Alternative. Western must carefully consider the costs of its projects, as all costs are recovered in the wholesale power rates it charges its utility customers, and not through tax dollars. In joint participation projects where Western partners with other utilities, the partners must recover their investment through their rates, typically retail rates to end users such as the residents of Estes Park. The costs of this Project would be similarly recovered and would be, therefore, similarly spread to ratepayers directly or indirectly.	David Batey
Alternative		A2	Public	Form Letter - See comment letter 22 The Estes-Flatirons Rebuild will clearly advance our man-made amenities by making our electric power more reliable and fire resistant. The gains in this area, however, may or may not result in a loss of natural amenities. Through WAPA's current plans to consolidate the power lines, fewer intrusions on the natural beauty will occur. By burying the remaining power lines in the Estes Valley, no power lines or power poles will be visible. By following the path they have labeled Variant A2, the clear cutting associated with any of the methods can be moved farther from our transportation routes, residential communities, and recreational areas. Variant A2 gives us clear gains in man-made amenities and enhancements of our natural amenities as well. By taking this opportunity to add value to our community through both better man-made amenities and better display of our natural amenities, WAPA can add value to the Estes Valley in yet another way. The Estes Valley survives economically by hosting millions of guests who are visiting Rocky Mountain National Park. While these guests enjoy the beauty of our natural environment, our shop owners try to make their visits enjoyable, memorable, and restful. By contributing positively to the natural beauty of the Estes Valley, WAPA will contribute to our guests' experiences and to the economic health of the Estes Valley. This can best be accomplished by modernizing our electric transmission using Variant A2, as that minimizes the barriers to the natural beauty and the disruption of our neighborhoods. It seems fair that we citizens of the Estes Valley share with WAPA's other electric service recipients in the costs of having high quality electric service. It also seems fair that all of WAPA's customers share as equally as possible in minimizing the environmental costs of providing their service. By undergrounding the Estes-Flatirons transmission lines using Variant A2 and sharing that extra cost with all affected	Commenter correctly states that the proposed project would improve reliability and reduce risk of wildfire-relayed outages, but at the cost of some impact to environmental resources. Removal of one line and abandonment of the existing ROW would allow that line route to revert back to natural vegetation and eventually merge with the rest of the area, and that aspect of the proposed Project is thus a tangible improvement to the Estes Park vicinity. Other adjustments to the line route as included in the Agency Preferred Alternative would also reduce existing impacts, especially visual. Underground and overhead line construction are fully discussed in **Sections 2.2.2** and **2.2.4**. **Section 2.8** presents the rationale that led to the selection of the Agency Preferred Alternative. Western must carefully consider the costs of its projects, as all costs are recovered in the wholesale power rates it charges its utility customers, and not through tax dollars. In joint participation projects where Western partners with other utilities, the partners must recover their investment through their rates, typically retail rates to end users such as the residents of Estes Park. The costs of this Project would be similarly recovered and would be, therefore, similarly spread to ratepayers directly or indirectly.	JoAnn Batey

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Alternative		A2	Public	Form Letter - See comment letter 22 The Estes-Flatirons Rebuild will clearly advance our man-made amenities by making our electric power more reliable and fire resistant. The gains in this area, however, may or may not result in a loss of natural amenities. Through WAPA's current plans to consolidate the power lines, fewer intrusions on the natural beauty will occur. By burying the remaining power lines in the Estes Valley, no power lines or power poles will be visible. By following the path they have labeled Variant A2, the clear cutting associated with any of the methods can be moved farther from our transportation routes, residential communities, and recreational areas. Variant A2 gives us clear gains in man-made amenities and enhancements of our natural amenities as well. By taking this opportunity to add value to our community through both better man-made amenities and better display of our natural amenities, WAPA can add value to the Estes Valley in yet another way. The Estes Valley survives economically by hosting millions of guests who are visiting Rocky Mountain National Park. While these guests enjoy the beauty of our natural environment, our shop owners try to make their visits enjoyable, memorable, and restful. By contributing positively to the natural beauty of the Estes Valley, WAPA will contribute to our guests' experiences and to the economic health of the Estes Valley. This can best be accomplished by modernizing our electric transmission using Variant A2, as that minimizes the barriers to the natural beauty and the disruption of our neighborhoods. It seems fair that we citizens of the Estes Valley share with WAPA's other electric service recipients in the costs of having high quality electric service. It also seems fair that all of WAPA's customers share as equally as possible in minimizing the environmental costs of providing their service. By undergrounding the Estes-Flatirons transmission lines using Variant A2 and sharing that extra cost with all affected regional electric customers, WAPA can improve the nature experience of millions of Americans and treat the citizens of the Estes Valley equitably at a monthly cost per customers that is very low. In summary, I ask that you encourage WAPA to enhance the natural beauty of the Estes Valley, add to the economic health of the Estes Valley, and treat its regional customers fairly through embracing Variant A2. If Variant A2 is simply not possible, the next best method for accomplishing these goals is best through Alternative A.	Commenter correctly states that the proposed project would improve reliability and reduce risk of wildfire-relayed outages, but at the cost of some impact to environmental resources. Removal of one line and abandonment of the existing ROW would allow that line route to revert back to natural vegetation and eventually merge with the rest of the area, and that aspect of the proposed Project is thus a tangible improvement to the Estes Park vicinity. Other adjustments to the line route as included in the Agency Preferred Alternative would also reduce~~d~~ existing impacts, especially visual. Underground and overhead line construction are fully discussed in **Section 2.2.2** and **2.2.4**. **Section 2.8** presents the rationale that led to the selection of the Agency Preferred Alternative. Western must carefully consider the costs of its projects, as all costs are recovered in the wholesale power rates it charges its utility customers, and not through tax dollars. In joint participation projects where Western partners with other utilities, the partners must recover their investment through their rates, typically retail rates to end users such as the residents of Estes Park. The costs of this Project would be similarly recovered and would be, therefore, similarly spread to ratepayers directly or indirectly.	Catherine Lawson
General	All	General	Public	The Board of County Commissioners believes the WAPA's analysis of environmental and other factors to be considered in the evaluation, addresses the concerns we noted in our original comments on the scoping of the EIS.	Thank you for your comment.	Tom Donnelly
Alternative	All	A & B	Public	With respect to the DEIS and the alternatives proposed, it is clear from the public comment received that there is generally a strong support of a "blended hybrid" approach to the routing, rather than relying upon strictly following one of the enumerated routes. Specifically there is strong support for a route, which stays south of Pinewood Reservoir, the B alternative, along the eastern reach of the route as well a similar support for the northern or A alternative alignment at the western end of the route.	Segments from several alternatives were in fact included in the Agency Preferred Alternative.	Tom Donnelly
Alternative	West	A2	Public	There is also a strong sentiment from commenter's, therfore the Board of County Commissioners would urge WAPA to closely examine the potential for underground facilities especially at the western end of the project. We believe at least some portion of the alignment that approaches the area of Mall Road and the "causeway" bears serious consideration to be constructed below ground.	Due to public and agency input, underground options were identified for the west end of the proposed Project. An underground option was not selected for the Agency Preferred Alternative. Please see **Section 2.2.4** of the Final EIS for a discussion of undergrounding, and **Section 2.8** for the rationale used in selecting the Agency Preferred Alternative	Tom Donnelly
Proposed Project	East	General	Public	We did also receive comments from individuals in the Pinewood Reservoir area who suggested that underground or the double circuit H-poles should be considered. We realize that this was not a part of any of the alternatives in the analysis of the DEIS, but would suggest that consideration of this issue is warranted.	The commenter's suggestion is not a viable option as a result of the short ruling span, fire risk, increased visual impact, and increased maintenance of the double-circuit 115-kV wood-pole H-frame structures. The undergrounding option was considered, and a discussion of the viability of this option can be found in **Section 2.2.4** of the Final EIS.	Tom Donnelly
Alternative, Visual	East	A, B, C	Public	We find that the eastern segments of Alternative A create unnecessary visual and physical impacts and cannot be supported. The western end of Alternatives B and C would create an undesirable visual impact to the neighborhoods directly affected.	While efforts would be made to reduce visual impacts, the proposed Project would remain visible to a greater or lesser degree depending on location. Western points out that most alternatives would result in the removal of one of the existing lines and abandonment of one entire ROW. Consolidation of the two lines would have a positive visual effect.	Tom Donnelly
Proposed Project	Central	General	Public	For the majority of the central section of the alignments, we would support the use of the higher brown metal towers to minimize the number of towers necessary.	Self-weathering and galvanized steel monopoles were considered, either for the entire project or for the parts of it where the dark poles would be most compatible. Opinions vary, as with all visual issues, as to whether galvanized steel or self-weathering is visually preferable (see comparison in **Section 4.12**). However, the latest field experience information from the utility industry on self-weathering structures indicates that ongoing corrosion weakens these structures, therefore shortening their expected service life. For this reason, and the fact the Forest Service prefers dull galvanized steel, self-weathering steel structures would not be used for this project.	Tom Donnelly

	Section of Route	Alternative	Public or Agency	Comment	Response	Author
Land Use and Recreation	All	General	Public	Larimer County Natural Resources would like to work closely with WAPA during the development of construction plans, in order to minimize impacts to our parks and open spaces. Larimer County and Northern Water will develop a future public access road, off County Road I SE, into Chimney Hollow Open Space. Depending on the status of our road plans, we would like to make sure the poles do not create a conflict with access.	Western welcomes the opportunity to coordinate project design plans with Larimer County Natural Resources as requested.	Tom Donnelly
General	All	General	Public	It has come to the Board of County Commissioners attention that there is currently a fiber optic communication line that is installed on the existing facilities, and this may not be continued with the rebuild. The line(s) apparently serve both the Platte River Power Authority as well as the Town of Estes Park for a variety of functions. We would strongly support the continuation of this public service for the future. It seems unreasonable to discontinue this service with the rebuilding of the power lines.	All action alternatives would include a fiber optic ground wire that would equal or exceed the capacity of the current fiber optic cable. However, the use of the fiber optic connections is beyond the scope of this EIS, just as power capacity allocations on the transmission line are not addressed.	Tom Donnelly
General	All	General	Public	The Board of County Commissioners heard from many well informed citizens who indicated that they did speak at one of the hearings held in Loveland or Estes Park they presented many issues which we cannot cover in our comments but believe careful consideration of their comments is warranted.	All comments received have been considered.	Tom Donnelly
Alternative	East	B	Public	The present north line is very close to our home and homes at the south end of Pinewood reservoir. We would prefer to have it removed. We both support "Option B" for building a single new power line to replace the aged and inadequate line on the existing south right of way. We believe it is sensible and efficient to remove the existing north line and towers so that only one line, capable of transmitting all present and anticipated power load need to be constructed and maintained. Using the existing wide and non-disruptive south right of way makes good common sense. ...we find "Option B" least damaging and disruptive to wildlife, the lives, property, homes, health and well being of residents.	The portion of the existing 'north line' that passes through Newell Lake View Subdivision would be relocated under all alternatives, including No Action, due to encroachments and safety concerns. However, one pole of each structure and a fiber optic ground wire would be left in place to maintain communications with the Bureau of Reclamation operated dam. Alternative B has been included as the Agency Preferred Alternative in this area.	Jim Wiegand, Janet Collins
Land Use and Recreation		B,D	Agency-Estes Valley Land Trust	Duplicate of comment letter 48 EVLT very much supports the variant alternatives that reflect the burying of the transmission lines. In section 4.12.6 Mitigation, the DEJS states "The most effective mitigating strategy for scenic resources is proper siting and structure design." EVLT disagrees: rather the most effective long-term mitigation strategy for protection of the scenic resources of the Estes Valley is burial of the lines. EVLT recognizes the additional cost involved, but believes that over the long term, this is the most effective strategy and requests that the final EIS language reflect this comment. EVLT has long-term responsibilities to protect its easements, and indeed under federal and state law, those responsibilities are in perpetuity. We would like to see WAPA also take a long term perspective and bury the transmission line as shown in variants CI or A2. Our second comment is that it is our understanding that the Right of Way owned by WAPA through the existing EVLT CE properties are 11 O' and that is the width required for alternatives B and D. In other words, EVLT understands that expansion of the RO W's through EVLT owned CE's for these alternatives would not occur, beyond that which existed at the time the easements were acquired. We requested a GIS data layer of the WAPA ROW at the open house on September 23rd to assist in the verification of the location of the ROW relative to EVLT's CE's (we have followed up this verbal request with emails to WAPA but have had no response). Our comments assume that the ROW's through EVLT's CE's would not be increased. EVLT would be opposed to any expansion from the existing ROW though its easements regardless of their current width if it is determined by WAPA that it is necessary to increase the width of these easements. Further, if any ground disturbance in EVLT CE's occurs with resulting soil disturbance, as indicated in the DEIS, EVLT would expect that the original topography and condition be reestablished and the disturbed areas restored.	An underground transmission line also requires a cleared ROW of, in this scenario, at least 50 feet. While an aboveground line requires structures and conductors, its ROW can contain shrubs and low-growing trees, and where spans cross draws and ravines there may be no clearing of vegetation at all save access to the structures themselves. An underground transmission line would require total clearance of woody vegetation across the entire ROW, and for its entire length. The effects of the structures and conductors diminish in front-lit, side-lit, and back-lit lighting conditions, in background terrain situations, and with a relatively short distance. The ROW clearings typically cause visual impacts throughout each day that are greater than the effects of the structures. An underground line cleared ROW in forested landscapes could be more visible than an overhead line ROW, as the latter would have darker shrubs and low trees to blend with the surrounding vegetation. Individuals will have varying opinions about which ROW is less obtrusive to them, but Western believes that the completely cleared ROW needed for underground construction would result in negligible benefits in many areas, and would be worse in some. Western has provided the requested GIS data layer. Where Western has existing ROW of 110 feet (the 'South Route'), on additional ROW would be required. Reclamation of construction disturbance is discussed in **Sections 4.4** and **4.7** of the Final EIS.	Mary Banken
Alternative	All	A	Public	The Impacted Landowners object to the inclusion of the New Right of Way in the Project.	Comment noted.	Daniel K. Brown
Alternative	All	A	Public	These collective comments principally concern the process failures in the development of the DEIS that resulted from the inclusion of the New Right of Way in the Project in the first place. By including the New Right of Way in Alternative A, this route alternative becomes not only unfair, but a product of a procedural failrure resulting from WAPA's failure to properly scope Alternative A *with the New Right of Way included* . For this reason, we request that any alternative, or blend of alternatives, that includes the New RIght of Way, or a variation of the New RIght of Way, be rejected in the Final EIS. To be clear, the Impacted Landowners are not commenting on, and do not wish to be involved in, other aspects of the Project, and encourage WAPA to select a route through each area and community that is best for that location. The same should be true of the Pinewood Reservoir area. In the end, a "blended route" that best mixes different aspects of existing alternatives may be the best solution, but in <u>no</u> event should any alternative include the New Right of Way.	Alternative A was identified during public routing workshops, and Western was asked to evaluate it. The route shown on the maps was conceptual only, and not intended to represent a final centerline. Weighing all of the factors Western must consider led to the selection of Alternative B as part of the Agency Preferred Alternative. Please see **Section 2.8** of the Final EIS for a more detailed discussion. Western has always intended to use portions of all the alternatives carried forward for full analysis in the EIS if it made sense to do so. The Agency Preferred Alternative is in fact such a combination.	Daniel K. Brown

	Section of Route	Alternative	Public or Agency	Comment	Response	Author
Alternative	All	A	Public	The New Right of Way was hastily developed, ill-conceived and not properly vetted during the scoping process. The New Right of Way would be an entirely new route that appeared for the first time in September 2014 when the DEIS was published. The route deviates, without sufficient basis and explanation, from the existing rights of way and, therefore, requires new easements through private property - property that is rugged, relatively undisturbed and contains environmentally important areas that will be damaged if the NEw RIght of Way is selected. Our understanding is that the New RIght of Way was offered as a variation of the "Northern Route" after the scoping process had concluded, largely, it appears, for the purpose of placating a few landowners where the two current rights of way exit. No notice of this new route was provided to the Impacted Landowners and no opportunity was offered for comment. Indeed, it is not even clear where the New RIght of Way will be located (the initial effort apparently being drawn right over the tops of certain landowners' homes).	The NEPA process requires that alternatives suggested by the public be evaluated in EISs. The commenter is correct that Alternative A was a later addition. It was identified and proposed by residents during public routing workshops, which were held to gather residents' thoughts on additional alternatives. The Alternative route shown on the maps was conceptual only, and not intended to represent a final centerline should that route prove viable. Due to steep terrain, access, and constructability issues, among others, Alternative A was not selected to be part of the Agency Preferred Alternative. Alternative B has been selected as part of the Agency Preferred Alternative. Please see **Section 2.8** of the Final EIS for a more detailed discussion.	Daniel K. Brown
Alternative	All	A	Public	This is not how alternatives are developed under the National Environmental Policy Act ("NEPA"), NEPA mandates that an agency must rigorously explore and objectively evaluate all reasonable alternatives. NEPA alternatives are not developed hastily behind closed doors based upon the complaints of a vocal few. Rather, NEPA analysis rests upon feasibility, cost-effectiveness, sound information and reason - all after sufficient notice and opportunity for public comment has taken place. The New Right of Way appears to be based upon none of these, but rather seemingly WAPA's effort to find the path of least public resistance to the route selected. The New Right of Way amounts to nothing other than shifting the burden of the Project from one group of peoperty owners (that bought property with the full knowledge of the existing easements) to the Impacted Landowners who had no reason to suspect (until the DEIS came out) that their properties would ever be potentially subjected to such intrusion and damage. Accordinly, the inclusion of the New Right of Way in Alternative A in the DEIS is improper on procedural grounds, and should be rejected.	The commenter mischaracterizes the development of Alternative A. The alternative was suggested by members of the public, residents of the area, in a public routing workshop held expressly to develop additional alternatives and address concerns that not enough alternatives had been considered. Western was requested to evaluate this alternative, and alternatives suggested by the public must be considered. Ultimately, upon consideration of all relevant factors, Alternative B was selected as the Agency Preferred Alternative in this area.	Daniel K. Brown
Alternative	All	A	Public	If WAPA persists with this ill-conceived idea to create an entirely new easement through the Impacted Landowners' properties, we request that WAPA engage in additional scoping and alternative review as it relates to the New Right of Way and other route alternatives in the Pinewood Reservoir area. After this is done, WAPA should prepare an amended or supplemental Environmental Impact Statement properly addressing the issues, concerns, alternatives and mitigation measures associated with any such route alternative(s). To do otherwise is not only unfair to the Impacted Landowners, but also would subject WAPA to potential litigation for failing to follow mandated NEPA procedural requirements.	Alternative A was not selected to be part of the Agency Preferred Alternative.	Daniel K. Brown
Alternative	East	A	Public	...The inclusion of the New Right of Way as part of Alternative A was a substantial change in the proposed action because it represents a significant deviation from the existing rights of way. This is all the more important because the Project is described as a transmission line "rebuild project." Just as a house is not "rebuilt" on a different piece of property, WAPA is not "rebuilding" a transmission line when iti s on an entirely new route. Thus, the Impacted Landowners would rightfully not be expecting to see alternatives developed that would deviate from the existing rights of way, and certainly were entitled to notice and input before alternatives involving the New RIght of Way were developed. WAPA was obligated to engage in additional scoping, at least in regard to the Project impacts in the Pinewood Reservoir area.	Re-routes of portions of an existing alignment made to avoid identified resource or human conflicts are accepted in transmission line rebuild projects. In any case, Western found serious issues with the public-suggested Alternative A, and it was not made part of the Agency Preferred Alternative.	Daniel K. Brown
Alternative	All	A	Public	NEPA law is clear that an agency cannot break a larger project into a series of smaller proejcts in order to avoid reviewing the cumulative environmental impacts. See the Yaak Committee v. Block, 840 F.2d 714 (1988). Similarly, an agency cannot use the scope of a larger project to obscure localized, site-specific environmetnal impacts within the more generalized impacts of the overall project. This is precisely what the DEIS does with its treatment of the New Right of Way. Meaningful analysis of the New Right of Way and comparison of alternatives, options and mitigation measures, is not possible because the impacts and the potential options are obscures by the much coarser analysis of Alternative A and the overall Project Alternatives.	A more detailed analysis of Alternative A was not necessary as just a high level analysis revealed issues serious enough to keep the alternative from being considered as part of an Agency Preferred Alternative.	Daniel K. Brown

	Section of Route	Alternative	Public or Agency	Comment	Response	Author
Alternative	East	A	Public	The DEIS fails to meet these NEPA requirements in the development and presentation of Alternative A, at least as it relates to the New Right of Way. The route through the Pinewood Reservoir area is a critical and controversial part of the Project. Common sense and NEPA requirements required that it receive "rigorous" analysis, which in this case must be equal, or at least similar, to the treatment given the route alternatives through populated areas in Estes Park. Unfortunately, this is not the case. The DEIS does not "sharply define," "rigorously explore" nor "devote substantial treatment" to this critical aspect of Alternative A. Unlike in the Estes area, where there are two separately defined, described and evaluated route variants, the New Right of Way was merely lumped into Alternative A. This is improper because: (1) the New Right of Way was not properly scoped; (2) is not adequately described or evaluated; (3) is not treated in a consistent manner as other route variants, such as Variant A 1, A2 and C1 .	A more detailed analysis of Alternative A was not necessary as just a high level analysis revealed issues serious enough to keep the alternative from being considered as part of an Agency Preferred Alternative.	Daniel K. Brown
Alternative	East	A	Public	Furthermore, it is clear from the DEIS that WAPA internally considered other "Northern Route" alternatives through the Pinewood Area, but dismissed them without much apparent evaluation, and certainly no public debate or input. For instance, a "reroute along Cottonwood Creek" option is briefly raised but summarily discarded because it would require "several miles of construction through steep terrain with poor access." DEIS, p. S-12. Lengthy construction through steep terrain with poor access would also be required for the construction in the New Right of Way. However, WAPA is promoting the New Right of Way while at the same time dismissing out-of-hand the Cottonwood Creek option. The only rationale given is that the New Right of Way is preferred because it "accomplishes the avoidance of the Pinewood Lake viewshed and the adjacent subdivision in a more direct and effective manner." Id. (emphasis supplied).	The difference between the 'Cottonwood Creek option' and Alternative A is that the former was identified by Western early on and briefly considered until obvious issues caused it to be eliminated from full analysis. Alternative A was raised later during public routing workshops by area residents who wanted Western to analyze a potential route in this area. NEPA anticipates that additional alternatives may be suggested by the public, as late as during comments on the Draft EIS. Alternative A is feasible, but it clearly has serious issues that kept it from being selected as part of the Agency Preferred Alternative. Commenter indicates Alternative A should have been placed in **Section 2.7**, Alternatives Considered but Dismissed, in the Draft EIS. However, as the alternative was requested to be analyzed by area residents, it was retained as a full alternative.	Daniel K. Brown
General	East	General	Public	In a report the size of the DEIS, it is remarkable how telling one statement can be, but this underlined provision above speaks volumes. First, this statement underscores that 'WAPA has implicitly elevated "avoidance [of impacts] to the Pinewood Lake viewshed and adjacent subdivision" above other environmental issues and the concerns of the Impacted Landowners, and WAPA 's own stated preference that the Project remain within the existing rights of way. NEPA alternatives are not selected based upon hidden value judgments or agency biases. Power lines constructed in the New Right of Way will certainly affect the Impacted Landowners' viewsheds, as well as cause other environmental damage (construction, deforestation, erosion, access road creation and maintenance, to name just few) and an unwarranted fire hazard.	Rebuilding the proposed Project on an existing ROW is a reasonable and feasible alternative that would be expected to compare favorably to other identified alternatives in terms of overall impact. Western also views rebuild projects as an opportunity to reduce identified local conflicts or impacts, such as the section of line through the Newell Lake View Subdivision. Development of the area has caused encroachments on the line and safety issues that require the line to be relocated in this area. Several of the potential impacts noted by the commenter would occur on other alternatives as well, and are all part of the resource impact tradeoffs the agency must consider when making its decisions.	Daniel K. Brown
General	All	General	Public	Second, the DEIS is not internally consistent because it does not treat all alternatives in the same way-a NEPA requirement. This is evident from the detailed treatment given Variants Al , A2 and C1 and the summary discarding of the "Cottonwood Creek" option. The New Right of Way does not receive the necessary detailed treatment, nor is it summarily discarded. Rather, it is incorporated into Alternative A, without description or justification. Such disparate treatment is arbitrary and unfair, and agency law is clear that arbitrary and capricious decisions constitute an abuse of agency discretion and violate NEPA.	Members of the public at the routing workshops hosted by Western identified Alternative A as an option they wanted Western to analyze. Western did so, and found a number of issues with access, steep slopes, and constructability, among others. A more detailed analysis of Alternative A was not necessary because a preliminary high level analysis revealed issues serious enough to refrain from additional analysis.	Daniel K. Brown
Alternative	All	B	Public	Even were it not the case that Alternative A with the New Right of Way was improperly included in the DEIS, it is evident, even from a cursory review of the DEIS, that Alternative B should be preferred to Alternative A. This conclusion can be fairly easily drawn from WAPA's own matrix of "Measurement Indicators for Key and Other Issues" contained in the DEIS, pages S-14 through S-27. Perhaps the most compelling reason, though the least emphasized in the DEIS, is that Alternative B does not deviate from the existing rights of way. This is a stated goal of WAPA. It also should be preferred as a matter of common sense and basic fairness. The south right of way has been in existence for over a half-century. Landowners in the area have purchased their properties with the full knowledge of the transmission line and associated easements. WAPA should not upset these settled expectations absent a compelling reason to do so. The DEIS offers no such reasons.	Western disagrees with the commenter's assertion that Alternative A was improperly included in the Draft EIS: area residents requested it be included. It was not selected as part of the Agency Preferred Alternative, while Alternative B in this area was selected. Western views rebuild projects as an opportunity to reduce identified local conflicts or impacts. Departing from an existing ROW when identified conflicts would be reduced by so doing, conforms to the goals of NEPA.	Daniel K. Brown
Alternative	East	General	Public	The Impacted Landowners, and others, will elaborate in more detail on the substance of the proposed alternatives, but I would like to highlight just a few that would suggest Alternative B should be preferred to Alternative A, at least as the route through the Pinewood Reservoir Area:	Thank you for your comment. Alternative B was in fact included in the Agency Preferred Alternative.	Daniel K. Brown
Alternative	All	A	Public	The New Right of Way, and Alternative A generally, require the acquisition of new easements and expanded easements. Alternative B does not require new easement acquisition (except in the Pole Hill substation area) and generally much less need for expanded easements.	Commenter is correct. Alternative B was included in the Agency Preferred Alternative in this area.	Daniel K. Brown

	Section of Route	Alternative	Public or Agency	Comment	Response	Author
Alternative	All	A	Public	Alternative A, through the New Right of Way, is through very steep and rough terrain where there is presently no access. Not only would structures need to be built but access roads created, with all the attending environmental damage, scarring and erosion that would occur. Grades in the area are from 25% to 70%, making road construction difficult, access difficult (particularly in the winter), maintenance more frequent and difficult, and erosion more severe. Alternative B is through relatively flat and accessible land.	Commenter articulates several of the reasons Alternative A was not selected to form part of the Agency Preferred Alternative.	Daniel K. Brown
Alternative	East	A	Public	Alternative A in the New Right of Way is through dense timber that would have to be cut, including old and significant Douglas Fir stands. This would create another visual scar. Vegetation in the Alternative B route in the Pinewood Area consists largely of grasses and low shrubs. As it runs through an existing right of way, there has been historical maintenance of these easements. It is hard to understand how WAPA could justify the removal of even more timber after the devastating fires of recent years, particularly when relatively clear rights of way already exist. Further, the remaining timber in the New Right of Way area would make it more likely that the lines could be impacted by wildfire or cause a wildfire.	Alternative A was not selected as part of the Agency Preferred Alternative; Alternative B was selected in this area.	Daniel K. Brown
Alternative	All	A	Public	The cutting of timber in the New Right of Way would result in habitat loss, in particular loss of habitat from the felling of old-growth trees. Additionally, there are caves that serve as habitat for wildlife along the proposed route in the New Right of Way. This habitat would be disrupted by construct ion and regular access for repair and maintenance.	Alternative A was not selected as part of the Agency Preferred Alternative; Alternative B was selected in this area.	Daniel K. Brown
Alternative	All	A	Public	Common sense dictates that the decision to site the existing power lines, when constructed, was based upon at least some level of analysis that would suggest that Alternative B is a more sensible, cost-effective route. There was no doubt a good reason that these existing lines attempted to avoid rocky, steep, rough, forested terrain.	Alternative B was selected in this area.	Daniel K. Brown
Alternative	East	B	Public	After attending all the scoping meetings over the past two years, including the workshops to present opportunities, identify constraints, to develop alternatives, and comment on the potential transmission line routes in the vicinity of the Pinewood Lake-Newell Lake View Subdivision areas, it has become apparent to me, that of the four alternatives "A", "B", "C", "D" and their respective variants, Alternative "B" will be identified and selected simply because of its much lower cost savings to "Western" and the least path of public resistance of the number of landowners affected.	Strong public support for Alternative B was one of many relevant factors Western considered in determining its Agency Preferred Alternative. See **Section 2.8** of the Final EIS for the rationale used to select the Agency Preferred Alternative.	Russell Atwood
Alternative	East	General	Public	During the public workshop scoping meetings, as well as, viewing the various existing "Western" rights of way easements and of hearing the potential "adverse effects" (which later were identified as "KEY ISSUES") voiced by my neighbors, myself, and of the various stakeholders present, I proposed an reasonable alternative which might solve most of, if not all of the negative effects of the proposed overhead transmission line- monopole project in and around the immediate Pinewood Lake area. • Simply bury the power line underground using a concrete vault on the existing right of way (Alternative B) 110 foot easement, which seems parallel to the existing 8" Natural Gas Line; from between the access road to Bald Mountain Radio facility and the intersection of Pole Hill Road West, across private and a corner of federal lands (approximately 1 mile) to the East boundary of the State Trust Land (see map). This option eliminates the construction of 9 of the 105 foot monopoles and transmission lines form the scenic VIEWSHED of all involved, and positively addresses most all of the resulting "KEY ISSUES." • Although "Western" cites higher costs prohibitive for 1 mile of potential underground construction for the Pinewood Reservoir recreation, conservation, and Newell Lake View Subdivision areas, "Western" has already determined that 2.7 miles of the transmission line in Estes Park will be constructed underground, (Summary S-7).	Many issues must be weighed for these types of projects, and resource trade-offs often have to be made. Contrary to the commenter's assertion, there has been no decision made to construct the proposed Project underground in the Estes Park area; final decisions on any aspect of the proposed Project will not be made until the Record of Decision is signed. Western has, however, disclosed its preferred course of action in the Final EIS with the identification of the Agency Preferred Alternative	Russell Atwood
Alternative	East	B & No Action	Public	1. Larimer County Commissioners and the City of Loveland, DEMAND that the 1 mile of the proposed Estes to Flatiron Transmission Line (alternative route "B" alignment which passes through the Pinewood Lake-Newell Lake View Subdivision be constructed UNDERGROUND with NO overhead pole construction OR: 2. Adopt the NO ACTION ALTERNATIVE for the Estes-Flatiron Transmission Project.	Western identified the proposed Project to replace existing wood-pole transmission lines that are well past their service life. As discussed in **Section 2.8** of the Final EIS, the No Action Alternative is not a viable option given the purpose and need for the proposed Action. Underground construction is discussed in **Section 2.2.4**.	Russell Atwood
Alternative	East	A	Public	An argument opposing the Alternative A WAPA power line relocation. Alternative A, as proposed, would run poles and lines parallel and adjacent to our northern property line. The 110' easement and the forest clearing for the lines as well as the road access for each power pole would unnecessarily add another scar to the landscape of the Pinewood area. Alternative A would be over some of the steepest and roughest terrain of anywhere along the Front Range foothills.	Alternative A, suggested by some area residents, was analyzed at their request. It was not selected to be part of the Agency Preferred Alternative.	Gary & Cindy Bragden

	Section of Route	Alternative	Public or Agency	Comment	Response	Author
Soils	All	A	Public	Road access to install and maintain the power poles and lines for Alternative A would create uncontrollable erosion issues due to the 25% to 70% grade of the west side of the mountain. There are caves on the west side of the mountain that native animals habitat that would surely be disrupted with the construction and maintenance of the power lines and poles.	Alternative A, suggested by some area residents, was analyzed at their request. It was not selected to be part of the Agency Preferred Alternative. **Section 4.9** analyzes these impacts to wildlife from the proposed project alternatives.	Gary & Cindy Bragden
Alternative	All	A	Public	We understand the need to upgrade the power transmission lines but we do not understand why, with all of the existing easements and power lines in place now, that we need to add a new scar to our landscape. The environmental, economic and logistical feasibility of Alternative A with all of the existing alternatives makes no sense to us.	Alternative A, suggested by some area residents, was analyzed at their request. It was not selected to be part of the Agency Preferred Alternative. **Section 4.9** analyzes these impacts to wildlife from the proposed project alternatives.	Gary & Cindy Bragden
Alternative		A2	Public	Form Letter - See comment letter 22 The Estes-Flatirons Rebuild will clearly advance our man-made amenities by making our electric power more reliable and fire resistant. The gains in this area, however, may or may not result in a loss of natural amenities. Through WAPA's current plans to consolidate the power lines, fewer intrusions on the natural beauty will occur. By burying the remaining power lines in the Estes Valley, no power lines or power poles will be visible. By following the path they have labeled Variant A2, the clear cutting associated with any of the methods can be moved farther from our transportation routes, residential communities, and recreational areas. Variant A2 gives us clear gains in man-made amenities and enhancements of our natural amenities as well. By taking this opportunity to add value to our community through both better man-made amenities and better display of our natural amenities, WAPA can add value to the Estes Valley in yet another way. The Estes Valley survives economically by hosting millions of guests who are visiting Rocky Mountain National Park. While these guests enjoy the beauty of our natural environment, our shop owners try to make their visits enjoyable, memorable, and restful. By contributing positively to the natural beauty of the Estes Valley, WAPA will contribute to our guests' experiences and to the economic health of the Estes Valley. This can best be accomplished by modernizing our electric transmission using Variant A2, as that minimizes the barriers to the natural beauty and the disruption of our neighborhoods. It seems fair that we citizens of the Estes Valley share with WAPA's other electric service recipients in the costs of having high quality electric service. It also seems fair that all of WAPA's customers share as equally as possible in minimizing the environmental costs of providing their service. By undergrounding the Estes-Flatirons transmission lines using Variant A2 and sharing that extra cost with all affected regional electric customers, WAPA can improve the nature experience of millions of Americans and treat the citizens of the Estes Valley equitably at a monthly cost per customers that is very low. In summary, I ask that you encourage WAPA to enhance the natural beauty of the Estes Valley, add to the economic health of the Estes Valley, and treat its regional customers fairly through embracing Variant A2. If Variant A2 is simply not possible, the next best method for accomplishing these goals is best through Alternative A.	Commenter correctly states that the proposed project would improve reliability and reduce risk of wildfire-relayed outages, but at the cost of some impact to environmental resources. Removal of one line and abandonment of the existing ROW would allow that line route to revert back to natural vegetation and eventually merge with the rest of the area, and that aspect of the proposed Project is thus a tangible improvement to the Estes Park vicinity. Other adjustments to the line route as included in the Agency Preferred Alternative would also reduce~~d~~ existing impacts, especially visual. Underground and overhead line construction is fully discussed in **Section 2.2.2** and **2.2.4**. **Section 2.8** presents the rationale that led to the selection of the Agency Preferred Alternative. Western must carefully consider the costs of its projects, as all costs are recovered in the wholesale power rates it charges its utility customers, and not through tax dollars. In joint participation projects where Western partners with other utilities, the partners must recover their investment through their rates, typically retail rates to end users such as the residents of Estes Park. The costs of this Project would be similarly recovered and would be, therefore, similarly spread to ratepayers directly or indirectly.	Terence & Jacqueline Chiplin
Visual	West	General	Public	A. WAPA Should Honor its Policy of Protecting and Enhancing the Environment The Crocker Ranch urges WAPA to recognize its commitment to environmental excellence and select the alternative that best minimizes adverse visual impacts to the environment and the historic nature of the valley.	Western recognizes the visual sensitivity of the proposed Project. The proposal to consolidate two separate lines into one and remove the other line and abandon its ROW is responsive to visual concerns. The abandoned ROW would eventually revegetate and become indistinguishable from the surrounding area. The rationale presented in **Section 2.8** documenting the selection of the Agency Preferred Alternative clearly reflects consideration of visual impacts. However, Western must consider many natural resource impacts, human conflicts, power system needs, and costs, among other issues, in making its decisions.	Zeke Williams, Teresa Abel
Purpose and Need	All	General	Public	B. WAPA's Purpose and Need Statement Should Aim to Minimize and Avoid Visual Impacts WAPA's purpose and need statement should be expanded to specifically include minimizing and avoiding the visual impacts of the transmission lines and rights of way.	It is not appropriate to include desired resource outcomes in the purpose and need statement. That statement is meant to specify the purpose and need to which the agency is responding in proposing the alternatives including the proposed action. The purpose and need to which Western is responding is stated in **Section 1.4.1**, with supporting information in the rest of **Section 1.4**. Western's purpose and need is to upgrade and rebuild aging transmission lines; visual impacts are just one of many natural resource impacts Western must consider when deciding how to replace the existing lines.	Zeke Williams, Teresa Abel
Purpose and Need	All	C1	Public	C. WAPA Should Select the Alternative that Best Accomplishes the Purpose and Need Objectives while Minimizing and Avoiding Adverse Visual Impacts WAPA should select the alternative that best satisfies its purpose and need objectives and minimizes and avoids visual impacts. The information disclosed in the Draft EIS supports selection of Variant C1.	The purpose and need to which Western is responding is stated in **Section 1.4.1**, with supporting information in the rest of **Section 1.4**. Western's purpose and need is to upgrade and rebuild aging transmission lines; visual impacts are just one of many natural resource impacts Western must consider when deciding how to replace the existing lines. Western's Agency Preferred Alternative is presented in **Section 2.8** of the Final EIS along with supporting rationale. Western believes this alternative best accomplishes Western's purpose and need while considering all public and agency comments, resource impacts including visual, and other relevant factors.	Zeke Williams, Teresa Abel

	Section of Route	Alternative	Public or Agency	Comment	Response	Author
Alternative	All	C1	Public	D. Variant C1 Best Accomplishes WAPA's Purpose and Need and Minimizes Visual Impacts. WAPA should reject Alternatives A, B, D and Variants A1 and A2 because they do not satisfy WAPA's purpose and need and they do not minimize visual impacts. Instead, WAPA should select Variant C1 or, alternatively, Alternative C.	The purpose and need to which Western is responding is stated in **Section 1.4.1**, with supporting information in the rest of **Section 1.4**. Western's purpose and need is to upgrade and rebuild aging transmission lines; visual impacts are just one of many natural resource impacts Western must consider when deciding how to replace the existing lines. Western's Agency Preferred Alternative is presented in **Section 2.8** of the Final EIS along with supporting rationale. Western believes this alternative best accomplishes Western's purpose and need while considering all public and agency comments, resource impacts including visual, and other relevant factors.	Zeke Williams, Teresa Abel
Cultural	West	General	Public	E. The Draft EIS Overlooks the Effect of Alternatives on the Crocker Ranch's Historic Sites and Structures The Crocker Ranch should be protected as an area of significant cultural and historic value. WAPA should fully assess the historic quality of the Crocker Ranch and structures on the ranch. WAPA should evaluate the alternatives in light of their adverse effects. Alternative A and Variants A1 and A2 are particularly disruptive to the ranch's historic qualities. WAPA should recognize that the Crocker Ranch and the structures on the ranch have significant historic and cultural value that is protected under the NHPA. It should not construct transmission lines or underground lines that adversely impact the historic sites and structures on the ranch.	The concerns expressed by the Crocker Ranch have been considered along with all the other comments received from the public and agencies. Alternative A and Variants A1 and A2 were not selected as the Agency Preferred Alternative, which would lessen the likelihood of potential impacts to the historic qualities of Crocker Ranch. A more detailed discussion in the rationale for the selection of Alternative C on the western portion of the project area as the Agency Preferred Alternative is detailed in **Section 2.8**.	Zeke Williams, Teresa Abel
Alternative	West	C1	Public	F. The Selected Alternative Should Distribute Impacts Fairly WAPA should select Variant C1 because it would distribute the impacts of the Project fairly. Although the transmission lines would cross the Crocker Ranch, they would be placed where they have the least amount of visual and environmental impact for everyone. The valley's iconic character and environmental health is important to the entire town of Estes Park and to the millions of visitors who travel to the Estes Valley to experience the scenic character of the land. Variant C1 protects these values and also meets all of WAPA's needs.	The concerns expressed by the Crocker Ranch have been considered along with all the other comments received from the public and agencies. The underground alternatives (A2 and C1) were analyzed for cost and other purpose and need factors. See Section 2.2.4 for analysis. Additionally, the replacement of an existing line with a new one should not have a substantial effect on a given property, and landowners have an opportunity to adjust the location of structures on their properties to better suit their needs (within certain engineering constraints). It is Western's goal to have the least possible effect to individual landowners, subdivisions as a whole, and businesses. Furthermore, all alternatives, with the exception of Alternative D and the No Action Alternative, would result in the consolidation of two ROWs to one. A more detailed discussion in the rationale for the selection of Alternative C on the western portion of the project area as the Agency Preferred Alternative is detailed in **Section 2.8**.	Zeke Williams, Teresa Abel
Land Use and Recreation	West	General	Public	G. WAPA Should Depict the Crocker Ranch on its Maps in the Final EIS and ROD WAPA should include maps in the Final EIS and ROD that depict the Crocker Ranch and show where each alternative would cross the ranch.	Crocker Ranch was added to **Figure 3.11-1** as suggested.	Zeke Williams, Teresa Abel
Visual	All	General	Public	H. WAPA's Visual Modeling is Incomplete WAPA's visual modeling has not captured key viewsheds along Highway 36. WAPA should include in the Final EIS visual modeling for at least two additional observation points – one looking southeast, and one looking northwest along Highway 36.	Additional visual simulations were developed for the Agency Preferred Alternative and are shown in **Appendix C** of the Final EIS.	Zeke Williams, Teresa Abel
Land Use and Recreation	West	General	Public	I. WAPA Should Correct Inaccuracies on Its Maps WAPA should edit the maps in the Final EIS to ensure that they depict Meadowdale Ranch in its correct location.	Text and figures have been modified as suggested in the Final EIS.	Zeke Williams, Teresa Abel
Proposed Project	All	General	Public	J. WAPA Should Fully Assess Underground Construction Costs and Options The Crocker Ranch urges WAPA to thoroughly assess the options and costs of underground construction in the Final EIS.	Undergrounding was discussed in the Draft EIS, and is covered in **Section 2.2.4** of the Final EIS. The underground alternatives (A2 and C1) were analyzed for cost and other purpose and need factors. Further discussion of the rationale supporting the selection of the Agency Preferred Alternative is presented in **Section 2.8.**	Zeke Williams, Teresa Abel
General	All	General	Public	K. WAPA Should Cooperate with Landowners in Selecting Specific Site Locations at the Design and Construction Phases. WAPA should state in the Final EIS that it will cooperate with landowners on a site-specific basis as to the exact location of the ROWs, transmission structures, and other on-the-ground impacts at the design, implementation, and construction stages so as to minimize and avoid adverse impacts.	Every affected landowner would have an opportunity to discuss the placement of the transmission line on their property during the right-of-way acquisition process. However, note that making accommodations for landowners may be limited because the situation on adjacent lands has to also be taken into consideration. This coordination would be accomplished during the discussions between Western Lands personnel and each landowner during negotiations for a ROW easement.	Zeke Williams, Teresa Abel
General	All	General	Public	L. WAPA Should Seek to Acquire ROW Voluntarily and Avoid Condemnation Where Possible The Final EIS should provide that WAPA prefers to acquire land for the transmission line facilities, ROW, and access routes through voluntary transactions with landowners rather than through condemnation.	Western makes every effort to work with affected landowners and avoid condemnation actions. **Section 2.3.1** of the Final EIS discusses eminent domain.	Zeke Williams, Teresa Abel

	Section of Route	Alternative	Public or Agency	Comment	Response	Author
Socioeconomics	West	General	Public	We will be negatively affected in many personal ways if the power lines are bigger than they are now. It will decrease the value of our property. People move to Estes Park for many reasons. The view from a person's home is important and adds to the home's value. A view certainly is one of the intangible values of a home in Estes Park, more so than other areas. People live on Pole Hill because the view of the mountains is fantastic here. The power lines are currently just in the edge of our view. We are concerned about how the power lines, if bigger, will change the view from our home.	Please refer to the discussion of property valuation in **Section 4.13** of the Final EIS. Commenter may well be correct that proximity to a transmission line and EMF source may cause a potential buyer to not purchase a particular property. However, property valuations are based on actual property transactions, and most studies done on transmission lines and property values largely show no or minor negative impacts to property values, and that any impacts tend to diminish over a few years. What the studies indicate is that while some people may object to the presence of a transmission line, there are still enough ready buyers that property values are not greatly affected, and the longer a line is present the more it becomes part of the backgrounds, and the less of a factor it is. Western also notes that these studies look at the impact of a new transmission line on property values, and not an upgrade of an existing line, where valuation considerations would be expected to be embedded in the present value of the property, and the presence of a line has been accepted. Western's Agency Preferred Alternative would remove one existing line and abandon the existing ROW. This would allow the abandoned ROW to disappear from the visual landscape over time. This positive visual and property owner benefit needs to be recognized as an offset to the proposed taller structures. As detailed in **Section 2.2.2**, shorter average height structures with a shorter span length could be considered in sensitive communities; however, the tradeoff for somewhat shorter structures is shorter spans and more structures.	Kevan Davidson
Electrical	All	General	Public	Also, having a small child, one on the way in January 2015, and hopefully more after that, my wife and I are seriously concerned about the health affects of having larger and more high voltage power lines close to our home. We are very concerned about the impact it will have on us, and not only us, but people who come to visit us. We have relatives with Pacemakers who have been told by their doctors to stay away from high-voltage power lines. This is very concerning to us.	The transmission lines would be designed to minimize EMF and would produce electric fields that are 70 percent less at the edge of the ROW than the existing lines. The new double-circuit line would reduce magnetic field levels to less than the existing H-frame line within the 110-foot-wide ROW due to cancellation of fields by the two circuits. A more detailed description of EMF as they relate to potential health effects and the proposed project is found in **Sections 3.14.1.3** and **4.14.5.1**. As detailed in **Section 4.14.3.5**, the maximum induced electrical field of any of the proposed alternatives is estimated at 0.5 kV/m, well below the estimated interference threshold of 3.4-kV/M. Therefore, with operation at 115 kV, the proposed project would not pose a risk to pacemaker wearers	Kevan Davidson
General	All	General	Public	Furthermore, my wife and I have concerns about our neighbors and our community, and the negative affect this change will have on them. We respectfully ask that you bury the power lines or move them away from our homes. Please do not build an eye-sore in front of our front window.	Alternatives that maximize the use of existing ROWs are considered to have the least economic effects. The replacement of an existing line with a new one should not have a substantial effect on a given property, and landowners have an opportunity to adjust the location of structures on their properties to better suit their needs (within certain engineering constraints). It is Western's goal to have the least possible effect to individual landowners, subdivisions as a whole, and businesses. The economic effect of the proposed project is detailed in **Section 4.13**. In order to reduce visibility, special design measures would be locally considered, including the use of structures with a lower height and shorter span. Lower height structures, if selected, would be approximately 10 to 20 higher than the existing H-frame wooden poles. Visual simulations of the structures are depicted in **Appendix C**. Rationale for the selection of the Agency Preferred Alternative is detailed in **Section 2.8**.	Kevan Davidson
Electrical	All	General	Public	I realize that the Western Area Power Association has an easement and the right to modify the lines, but I respectfully ask you to consider either an alternate route or burying the lines. I am concerned about the effect of the higher voltage on my health and that of my family. I am also concerned about how it could affect visitors, as both my grandfather and father have pacemakers and have been instructed to stay away from high voltage lines. Furthermore, enlarging the towers will cause a decline in our property value as it will intrude on our view of the Front Range. I know there are several other residents who share these concerns. Please consider alternatives that would prevent visual pollution and protect the health of residents who live along this utility corridor.	There have been several alternative routes studied in the EIS, All involve some sort of resource trade-offs, and most, including the Agency Preferred Alternative, include the removal of one of the two existing lines, and abandonment of the ROW. This would result in an improvement to the existing visual setting. In the end, the rebuilt transmission line has to go somewhere, and Western's rationale for the selection of the Agency Preferred Alternative is presented in **Section 2.8** of the Final EIS. As detailed in **Section 4.13**, most studies found no effect to property values when adjacent to electrical transmission lines, which was attributed to the addition of open space contributed by the transmission line easement. Additionally, in the case of this project, many of the residences have property values that have taken into account the presence of the transmission lines because they have been built near or against the easements of the existing transmission lines. A detailed discussion regarding the visual assessment is located in **Section 4.12**. The transmission lines would be designed to minimize EMF and would produce electric fields that are 70 percent less at the edge of the ROW than the existing lines. Additionally, the new double-circuit line would reduce magnetic field levels to less than the existing H-frame line within the 110-foot-wide ROW. A more detailed description of EMF as they relate to potential health effects and the proposed project is found in **Sections 3.14.1.3** and **4.14.5.1**. As detailed in **Section 4.14.3.5**, the maximum induced electrical field of any of the proposed alternatives is estimated at 0.5 kV/m, well below the estimated interference threshold of 3.4-kV/m. Therefore, with operation at 115 kV, the proposed project would not pose a risk to pacemaker wearers.	Roberta Davidson

	Section of Route	Alternative	Public or Agency	Comment	Response	Author
Visual	West	General	Public	We hope that the power lines will be buried so that the Estes Park Valley will be as stunning as it can be without the eyesore. In addition, we have concerns about the possible health hazards of the power lines, especially to our children and to others starting families and already having small children. We most strongly support the option of burying the power lines. We support the opinions of Joy and Rich Harvey included in their letter to WAPA. We appeal to the conscience of those representing us on the WAPA board. We support the option of burying the power lines for the following reasons: 1) Burying the power lines will enhance the beauty of the area and be more attractive to the approximately 10 million visitors from around the world who come annually to the Estes Park Valley and to Rocky Mountain National Park, as well as those who live here, drawn by the natural beauty of our national treasure; 2) There are serious on-going concerns about the health effects from exposure to power-line frequency electric and magnetic fields (EMF), particularly to pregnant women and young children; 3) It is unfair to the homeowners who would be negatively impacted by the new power-lines above ground. We strongly are in support of burying all power lines, both in Estes Park, and from Estes Park to Loveland.	Several alternative routes have been studied in the EIS, all involve some sort of resource trade-offs, and most, including the Agency Preferred Alternative, include the removal of one of the two existing lines and abandonment of the ROW. This would result in an improvement to the existing visual setting. Western's rationale for the selection of the Agency Preferred Alternative is presented in **Section 2.8** of the Final EIS. The transmission lines would be designed to minimize EMF and would produce electric fields that are 70 percent less at the edge of the ROW than the existing lines. Additionally, the new double-circuit line would reduce magnetic field levels to less than the existing H-frame line within the 110-foot ROW. A more detailed description of EMF as they relate to potential health effects and the proposed project is found in **Sections 3.14.1.3** and **4.14.5.1. Section 3.14.1.3** and **4.14.5.1** of the Final EIS discusses the EMF/potential health risk issue. As detailed in **Section 4.14.3.5**, the maximum induced electrical field of any of the proposed alternatives is estimated at 0.5 kV/m, well below the estimated interference threshold of 3.4-kV/m. Therefore, with operation at 115 kV, the proposed project would not pose a risk to pacemaker wearers	Carol Dreselly and Steve Thomas
Transportation	East	General	Public	The paragraph numbers refer to WAPA Rebuild Project-Group Statement.pdf 8. Most existing structures are outside of the 300 foot buffer zone. In the Pinewood Reservoir area the terrain is open and relatively flat. Structures (houses, barns, storage buildings) are few and far apart. There is easy access for installation and maintenance of the transmission lines and structures. There will be no need for additional access roads. The open terrain will require a minimum of roads, easing maintenance costs and limiting the damage caused by roads.	Western is unsure what the commenter means by a 300-foot buffer zone. Several other commenters have referenced a 300-foot-wide ROW, but the ROW would in fact be 110 feet wide, with no additional 'buffer zone'. Comment implies support for Alternative B in the Pinewood vicinity, and Alternative B has been made part of the Agency Preferred Alternative in this area.	Craig & Jean Driear
Alternative	East	B	Public	9. ROW acquisition costs are only $0.4 million versus up to $1.8 million. Only 3 National Register of Historic Place-eligible historical sites are potentially impacted versus as many as 8 for other alternatives. Alternative B avoids the historically significant 1910 school house located near Pinewood Reservoir. Only 6 wetlands will be crossed versus a maximum of 15 for other alternatives.	Alternative B has been selected as part of the Agency Preferred Alternative in this area.	Craig & Jean Driear
Alternative	East	A	Public	Additional Arguments Against Alternative A 2. In Table 2.7-1, one of the stated reasons for dismissing reroutes along U.S. Highways 34 & 36 is "These proposals were not carried forward because they do not address the issues raised during scoping, but simply displace impacts to new landowners and may require constructing an additional length of transmission line.." A reason for dismissing the proposed route near Pinewood Reservoir Stewardship Trust and Blue Mountain Bison Ranch is repeated "...and displaced impacts to new landowners." The same argument applies to the Green Mountain properties for any variant of Alternative A.	The alternatives not carried forward were identified by Western early on and briefly considered until obvious issues caused them to be eliminated from full analysis. Alternative A was raised later during public routing workshops by area residents who wanted Western to analyze a potential route in this area. NEPA anticipates that additional alternatives may be suggested by the public, as late as during comments on the Draft EIS. Alternative A could be constructed, but it has serious issues that kept it from being selected as part of the Agency Preferred Alternative. However, as the alternative was requested to be analyzed by area residents, it was retained as a full alternative.	Craig & Jean Driear
Alternative	East	A	Public	3. More than 1 ½ miles of new ROWs will need to be acquired, an expensive and time consuming process. There exists the potential for litigation from resistant landowners. Cost increases for Alternative A have been quoted to us as up to a 25% increase in construction costs (from Gregory Johnson, 10/29/14 "higher due to the access roads identified in paragraph 2.3.2, additional turning structures, and difficult terrain" and "$500,000 additional may be required for land and easement costs for this portion of alternate A.") These will increase the cost of Alternative A to $29.6 million, the highest of any alternative without buried cables. In the Pinewood Reservoir area, a simpler and less expensive solution is to use the existing ROWs, such as Alternative B.	Alternative B has been selected as part of the Agency Preferred Alternative in this area.	Craig & Jean Driear

	Section of Route	Alternative	Public or Agency	Comment	Response	Author
Alternative	East	A	Public	4. If acquired, the new ROWs will need to be cleared to a width of 110' and all of the wood and slash removed. Over such extreme terrain this is a difficult, dangerous and expensive proposition. The steep, newly cleared land will be subject to erosion from snow melt & rain. In addition, access roads to each new structure will be created, of sufficient width to accommodate the large vehicles required to install the structures. Even with switchbacks, which will affect even more acreage, the extreme roads, now devoid of vegetation, will be expensive to maintain and open to severe erosion throughout the year. In Table 2.7-1, one of the reasons for dismissing the Cottonwood Creek route states "This alternative would require several miles of construction through steep terrain with poor access." As the terrain along Cottonwood Creek is not as difficult as Green Mountain we feel the same reason applies to Green Mountain for its dismissal.	Members of the public at the routing workshops hosted by Western identified Alternative A as an option they wanted Western to analyze. Western did so, and found a number of issues with access, steep slopes, and constructability, among others. Alternative A was not selected to be a part of the Agency Preferred Alternative. Alternative B on the east end of the proposed Project has been included as part of the Agency Preferred Alternative.	Craig & Jean Driear
Alternative	East	A	Public	6. The proposed re-route of Alternative A, nudged to the north on Green Mountain has removed several houses from being within 10's of feet of the lines. However, they are still close to the lines and threatened by fire losses.	Members of the public at the routing workshops hosted by Western identified Alternative A as an option they wanted Western to analyze. Western did so, and found a number of issues with access, steep slopes, and constructability, among others. Alternative A was not selected to be a part of the Agency Preferred Alternative. Alternative B on the east end of the proposed Project has been included as part of the Agency Preferred Alternative.	Craig & Jean Driear
Wildlife	East	General	Public	Additional comments not addressed by the Group Statement, but merit your attention: -Wildlife, one of the major attractions for moving to the area, will be negatively affected. The statement that elk, mule deer and moose will be affected falls far short of the wildlife in this area. While living on Green Mountain we have seen: Dusky Grouse Bald Eagles Golden Eagles Mountain Lions Bobcats Foxes Turkeys Bears Albert Squirrels Owls Bats Colorado Bluebirds -In the area are caves used by a variety of wildlife. These animals will be displaced by the construction and maintenance of the transmission lines and may never return.	**Section 3.9** identifies the wide variety of wildlife within the project region and **Section 4.9.3** does address the impact of wildlife displacement as a result of project construction. While construction could cause some species the avoid the area temporarily, this would be a minimal impact of short duration.	Craig & Jean Driear
Vegetation	All	General	Public	There are also groves of Douglas Fir trees, unusual for this area, that are in path of the proposed transmission line. Clearing of ROWs and creating roads could destroy these trees and lessen the diversity of the forest, making it more vulnerable to disease and pestilence.	Members of the public at the routing workshops hosted by Western identified Alternative A as an option they wanted Western to analyze. Western did so, and found a number of issues with access, steep slopes, and constructability, among others. Alternative A was not selected to be a part of the Agency Preferred Alternative. Alternative B on the east end of the proposed Project has been included as part of the Agency Preferred Alternative.	Craig & Jean Driear
Vegetation	All	B	Public	In recent years we have experienced a significant loss of trees to Pine/IPS/Twig Beetles and wildfires. We find it difficult to understand how the destruction of even more forest to ROWs, access roads and staging areas can be justified. Cleared ROWs are already available along Alternative B, minimizing the additional clearing of trees.	Alternative A was not selected to be a part of the Agency Preferred Alternative. Alternative B on the east end of the proposed Project has been included as part of the Agency Preferred Alternative.	Craig & Jean Driear
Socioeconomics	East	B	Public	Many purchase their property for retirement, the last home they plan to buy. If Alternative A is selected, properties on Green Mountain would have a compromised view-shed and possible health factor, not foreseen when purchased. Plans to develop and improve the land overlooking or close to the new ROW will be affected and would no longer be feasible. Despite WAPA's conclusions in the Draft EIS, section 4.13.3.2 which claims "Most studies found no effect to [long term] property values…", there will be a severe downward effect on the value of any property newly traversed by transmission lines. However, in section 4.13.5 it is stated "…estimates of the decrease in property values range from 2 to 9 percent." We are in the process of obtaining a statement of property devaluation with a comparable. Preliminary estimates show a loss significantly more than their estimate, of at least 50 percent.	Alternative A was not selected to be a part of the Agency Preferred Alternative. Alternative B on the east end of the proposed Project has been included as part of the Agency Preferred Alternative. Commenter may well be correct that proximity to a transmission line and EMF source may cause a potential buyer to not purchase a particular property. However, property valuations are based on actual property transactions, and the studies done on transmission lines and property values largely show no or minor negative impacts to property values, and that any impacts tend to diminish over a few years. What the studies indicate is that while some people may object to the presence of a transmission line, there are still enough ready buyers that property values are not greatly affected, and the longer a line is present the more it becomes part of the backgrounds, and the less of a factor it is. Western also notes that these studies look at the impact of a new transmission line on property values, and not an upgrade of an existing line, where valuation considerations would be expected to be embedded in the present value of the property, and the presence of a line has been accepted.	Craig & Jean Driear
Electrical	East	B	Public	Possible health effects from transmission lines have not been ruled out, please refer to the individual comments on health effects submitted by Pamela Mausner, MD. We feel that safety is best served by locating transmission as far as possible from as many homes as possible, which can best be accomplished by Alternative B in the Pinewood Reservoir area.	The transmission lines would be designed to minimize EMF and would produce electric fields that are 70 percent less at the edge of the ROW than the existing lines. Additionally, the new double-circuit line would reduce magnetic field levels to less than the existing H-frame line within the 110-foot-wide ROW. A more detailed description of EMF as they relate to potential health effects and the proposed project is found in **Sections 3.14.1.3** and **4.14.5.1**. In any case, Alternative B was selected in this area for inclusion in the Agency Preferred Alternative.	Craig & Jean Driear

	Section of Route	Alternative	Public or Agency	Comment	Response	Author
Electrical	East	General	Public	Verizon customer service has claimed that a high tension line installed on the north side of Green Mountain would decrease our cell phone signal by up to 50%. Our current cell phone reception is poor - our other telephone service is VOIP with Skybeam. When our internet is down or the service is slow, our telephone is unreliable. Our property has a 360 degree view of the area allowing us to watch for wildfires. If any are seen we can report them to 911. In other emergencies cell phones maybe our only way to contact help.	EMF from modern transmission lines is at a very low 60 hertz, far lower than the 800-2,500 megahertz ultra-high frequency ranges used by cell phones. EMF at 60 hertz do not cause cell phone or landline interference. In fact, cell phone transmitter/receiver equipment found on typical cell towers is routinely mounted to transmission line structures in developed areas where space is limited. For similar reasons the transmission line would not affect radio or TV frequencies. In isolated instances loose or damaged conductors or hardware can cause arcing, which can result in broadband interference at close distances. Once reported these issues are easily resolved.	Craig & Jean Driear
General		General	Agency-EPA Region 8	General Considerations The EPA supports Western's decision to prepare a Draft EIS for this proposed project. The decision to prepare an EIS rather than an Environmental Assessment was based on concerns about the significance of the environmental impacts raised during public meetings and comments in 2011 and through scoping in 2012. The EPA also supports Western's stated purpose and need as including the need to increase the resiliency of the transmission infrastructure which has not been updated since its original construction in the 1930s and 1950s.	Thank you for your comment.	Phillip S. Strobel
Water		General	Agency-EPA Region 8	Aquatic Resources The Draft EIS does not disclose which waters in the project area have been impacted by the recent flood event of 2013 (e.g. Colorado 1-lighway 34 and associated road/stream/restoration repair work done). It is EPA's understanding that water resources, specifically water quality, aquatic life habitat, stream bank integrity and road systems have been dramatically affected by the events of the 2013 flood. The EPA recommends that Western contact the Colorado Department of Transportation, the Colorado Parks and Wildlife and the Colorado Department of Public Health and Environment, or the Governor's Disaster Recovery Office to identify current information related to water resources, and road systems affected by the recent flood and restoration work. The EPA recommends Western include this information in the Final EIS. We also recommend the Final EIS assess how current conditions influence the affected environment and the project's environmental impacts.	The potential effects of the proposed Project on water resources is covered in **Section 4.5.5** of the Final EIS. The Agency Preferred Alternative would not result in significant impacts to water resources. Only short-term and temporary impacts were found for surface and groundwater resulting from the proposed Project. EPA is correct that the 2013 flood affected roads and water resources in the Estes Park area, but those affected areas are largely in the Big Thompson River corridor. The existing transmission lines were not affected by the flood. They are located on higher ground and either span or entirely avoid the areas affected by the flood or restoration efforts. As such, the required analysis of the effects of the proposed Project did not need to address effects of the 2013 flood~~,~~. Analysis of flood impacts is outside of the scope of the EIS.	Phillip S. Strobel
Wetlands	All	General	Agency-EPA Region 8	Wetland impacts are common with transmission line projects and can be significant to the geographic scope of these linear projects. Clearing vegetation in and around wetlands can alter the functional type of the wetlands and can affect wetland hydrology. Additionally, some transmission projects have included direct fill of wetlands for service roads and tower bases.	Western's vegetation management plan provided in **Appendix B** describes the vegetation management techniques. Clearing vegetation in or near wetland areas is not part of the plan. Avoiding or spanning wetlands ~~(rather than filling them)~~ is planned.	Phillip S. Strobel
Wetlands	All	General	Agency-EPA Region 8	EPA appreciates the use of the Southwest Regional Gap Analysis Project (SWReGAP) data in the Draft EIS to present approximate identifications of wetlands i11tl1e project vicinity and that were not part of the 2011 110 foot ROW inventory along the existing transmission lines and access roads.	Thank you for your comment.	Phillip S. Strobel
Wetlands		General	Agency-EPA Region 8	The Draft EIS indicates that site specific wetland inventories in proposed new ROW acquisitions, re-routes and/or alternative variants will not be completed until after a Record of Decision (ROD) is selected. The EPA notes that for (non-federal land) areas, like the re-route along the Newell Lake View subdivision, wetland surveys and delineations have not been completed. Finally, the Draft EIS states wetland and waters of the U.S. field surveys have not been completed along the proposed alternative variants A2 and Cl routes, and that if wetlands are located along these routes that impacts could be significant, resulting in the removal of the wetlands and associated vegetation. Without a wetland inventory for ROWs for the Newell Lake Viewsubdivision, and for the A2 and Cl variants it is not possible to determine which alternative will have the least impact to wetlands. Therefore, based on the lack of information in the Draft EIS on wetlands surveys and potential impacts in some alternatives, it is not possible to determine a complete magnitude of impact for the alternatives. It is also not possible to determine whether specific measures to mitigate impacts to wetlands or other surface waters in new ROW alternatives, re-routes and variants are adequate. The EPA recommends that the Final EIS identify specific wetland and other surface water resources in all alternatives to enable a comparison of potential impacts and informed decisions on how those impacts can be mitigated.	Western has selected Alternative B in the eastern portion as its Agency Preferred Alternative. **Section 4.6** of the Final EIS details potential impacts to wetlands as well as wetland mitigation measures. Avoiding or spanning wetlands is planned.	Phillip S. Strobel
Wetlands	All	General	Agency-EPA Region 8	The Draft EIS states that the preferred alternative, once selected, will avoid impacts to wetlands from roads, structures and re-routing as necessary after delineation results are compiled. Please clarify in the Final EIS what is meant by the phrase ''as necessary." We recommend that the Final EIS clarify that in addition to the protections required by the Clean Water Act, Executive Order 11990 directs federal agencies to avoid impacts to all wetlands regardless of jurisdiction, and commit to providing protection of all wetlands and mitigation for all impacts. See: Http://water.epa.gov/lawsregs/guidance/wetlands/eo11990.cfm.	The Final EIS **Sections 2.8** and **4.6** clarifies that Western plans to avoid impacts to all wetlands regardless of jurisdiction, and commits to providing protection of all wetlands.	EPA Region 8

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Air Quality		General	Agency-EPA Region 8	Greenhouse Gases Sulfur hexafluoride (SF6) has often been used in electrical transmission equipment, including transformers and circuit breakers. The global warming potential of SF6 is 23,900 times that of CO2 when compared over a 100-year period, making it the most potent greenhouse gas that the Intergovernmental Panel on Climate Change has evaluated (source:http://epa.gov/clin1atecha11ge/ghgen1issio11s/gases/fgases.html). According to EPA research on power systems using SF6 systems, 15% of those systems experience leaks and of that 15%, 10% can be repaired. While this is a small subset of an entire system's equipment that may be releasing greenhouse gasses, due to the potency of SF6, the EPA recommends that the Final EIS identify what steps Western has taken and will take to either substitute SF6 emitting equipment or mitigate the greenhouse gas emissions from leaking electrical transmission equipment. Much has been done in this area and EPA recommends Western include its contributions and reporting history with the SF6 Partnership initiative and The EPA Green House Gas Emissions Inventory in the Final EIS (see: http://www.epa.gov /e lectricpower-sf6/documents/SF6 Annual Report 2013 .pdf).	The proposed Project is a transmission line upgrade. No SF6 equipment would be involved.	Phillip S. Strobel
General		General	Agency-EPA Region 8	The EPA 's Rating Based on the EPA's procedures for evaluating potential environmental impacts on proposed actions and the adequacy of the information present, the EPA is rating the Draft EIS Alternatives A through D, including all Alternative Variants and excluding the No Action Alternative, EC-2 (Environmental Concerns - Insufficient Information). The "EC" rating means that the EPA's review has identified potential impacts that should be avoided in order to fully protect the environment. The "2" rating means that the Draft EIS does not contain sufficient information for EPA to fully assess environmental impacts. A description of the EPA's rating system can be found at http://www.epa. gov/compliance/nepa/comments/ratings.html.	Comment noted. The EPA's comments have been addressed in this comment/response table and in the Final EIS.	Phillip S. Strobel
Alternative	All	A	Public	We request that WAPA use Alternative A in the impending Rebuild project. The multiple reasons for this request are: 1) cosmetic/ property financial devaluation, 2) perceived health risks & 3) stated alternatives in the EIS.	Western selected Alternative B as part of the Agency Preferred Alternative in this area. See **Section 2.8** of the Final EIS for the rationale for the Agency Preferred Alternative.	James & Patrica Gildart
Socioeconomics	All	General	Public	The 1st reason is based on our own rejection of a home for sale on Stanley Circle this last fall. In our search for homes in the area' we drove up to a cute 2 story home with Transmission Lines in the back yard. We didn't even get out of our car. Our property on Pole Hill is residential and we didn't really see the Lines until after we started exploring the Hill and the forest access. Of course, the structures supporting the lines now are 76 & 61 years old, respectively and somewhat blend with their surroundings. It's a little hard to envision a series of 110 ft poles that will blend with their surroundings. In our travels, we've seen the large octagonal steel transmission poles that run between the electric generation windmill farms and would hate to see them in our sub-division with possible resultant property value loss. Reviewing a study by Jackson & Pitts in 2010 entitled, "The Effects of Electric Transmission Lines on Property Values: A Literature Review", reveals that in 1967 people didn't much mind the presence of the Lines in their neighborhoods, but that by 1992, people were very aware and found their presence in their sub-division objectionable and they resulted in lower property values. See Exhibit 1, page 5 & 6. See also, Price Effects of HVTLs on Abutting Homes, by Delaney and Timmons in The The Appraisal Journal, Winter 2013, Pgs. 46 & 52, wherein they quote studies of homes served by the Bonneville Power Authority that resided on an acre or more losing some avg of 10% value to to close proximity.	Commenter may well be correct that proximity to a transmission line and EMF source may cause a potential buyer to not purchase a particular property. However, property valuations are based on actual property transactions, and the studies done on transmission lines and property values largely show no or minor negative impacts to property values, and that any impacts tend to diminish over a few years. What the studies indicate is that while some people may object to the presence of a transmission line, there are still enough ready buyers that property values are not greatly affected, and the longer a line is present the more it becomes part of the backgrounds, and the less of a factor it is. Western also notes that these studies look at the impact of a new transmission line on property values, and not an upgrade of an existing line, where valuation considerations would be expected to be embedded in the present value of the property, and the presence of a line has been accepted. In the case of this project, many of the residences have property values that have already taken into account the existing transmission lines and easements. A more detailed discussion regarding property values can be found in **Section 4.13**.	James & Patrica Gildart
Electrical	All	General	Public	The 2nd reason is the question of power-line EMFs and health effects. After searching for information in the possible health ill-effects, we find that too much controversy abounds in this area to wish to replace the old lines with towering poles through our sub-division, especially when Alternatives exist. See http://www.safespaceprotection.com/electrostressfrom-power-lines.aspx for one conglomeration of information available on this subject.	The transmission lines would be designed to minimize EMF and would produce electric fields that are 70 percent less at the edge of the ROW than the existing lines. Additionally, the new double-circuit line would reduce magnetic field levels to less than the existing H-frame line within the 110-foot-wide ROW. A more detailed description of EMF as they relate to potential health effects and the proposed project is found in **Sections 3.14.1.3** and **4.14.5.1**.	James & Patrica Gildart
Alternative	West	General	Public	Finally, the 3rd reason is the availability of the Alternatives in the EIS. We moved to Estes Park from the limestone environment of the Texas Hill Country north of San Antonio, Texas where we lived in the middle of ranch-land acreage. In building our family home, we were on well water but had both telephone and electrical brought in underground, which required a track-type rock saw. The EIS alternatives don't go so far as to propose complete burial, but taking the possibly more direct route through ranch-land, USFS, etc. sounds like a more modern approach to viably rebuild the Estes-Flatiron Transmission Line Project.	Thank you for your comment.	James & Patrica Gildart

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Alternative	East	A	Public	ALTERNATIVE A As outlined in the Pinewood community group statement (titled "WAPA Rebuild Project--Group Statement.pdf"), Alternative A would require the acquisition of new rights-of-way (RoWs) and the development of access roads through steep, heavily forested terrain on the north side of Green Mountain. The resulting loss of trees would not only irreparably destroy the visual beauty of the area, but would also likely lead to severe erosion. Wildlife would be displaced – not only mammals, but also (according to my next-door neighbors, who are dedicated birdwatchers) more than 50 species of birds. Like many of my neighbors, I bought a home in the Pinewood community because I wanted to enjoy the peace and beauty of the mountain and its wild creatures. Although my house is on the south side, I walk almost every day (both for pleasure and for health reasons) to the top of Green Mountain and along the north side. If Alternative A is chosen, the peace and beauty would be gone forever. Walking would become a distressing chore rather than a pleasure, and this would surely have an adverse effect on my health.	Alternative A was not selected to be a part of the Agency Preferred Alternative in this area.	Pamela Mausner, MD
Electrical	East	A	Public	Another issue outlined in the Group Statement is the fire hazard that would be created by Alternative A due to the possibility of arcs, downed power lines, and fires accidentally started by workers or vehicles. In the 10 years that I have lived here, fire has been an increasing concern – especially since the Reservoir Road fire several years ago, when we had to evacuate. I know how fast a wind-driven fire can move, and that it can easily jump across a road – or a RoW. I am the sole caregiver for my 94-year-old disabled mother, who lives with me. If we had only minutes to evacuate, we would be hard-pressed to get out with our lives – much less save any important belongings. Therefore, any avoidable increase in fire risk is unacceptable.	Members of the public at the routing workshops hosted by Western identified Alternative A as an option they wanted Western to analyze. Western did so, and found a number of issues with access, steep slopes, and constructability, among others. Alternative A was not selected to be a part of the Agency Preferred Alternative. Alternative B on the east end of the proposed Project has been included as part of the Agency Preferred Alternative.	Pamela Mausner, MD
Electrical	East	A	Public	A third issue is that of cell phone reception. Currently, we have little reception in our area, but as one goes up Green Mountain Drive toward the top, there are some spots where it is possible to get a signal. I have been advised by a Verizon customer service representative that a high-voltage transmission line on the north side of Green Mountain would reduce what little cell reception we have by approximately 50%. This situation would be more than inconvenient; it could be dangerous. Some of my neighbors have no land line; they have Skybeam phone service, which utilizes the internet. If their internet service goes down (as it sometimes does), their only way of communicating with the outside world (short of leaving home) is by cell phone. During times of severe fire danger, I have often carried my cell phone with me on my walks, so that I can call 911 if I see smoke. It appears that Alternative A would not only increase our fire risk, it could also decrease our ability to respond rapidly in the event of a fire.	EMF from modern transmission lines is at a very low 60 hertz, far lower than the 800-2,500 megahertz ultra-high frequency ranges used by cell phones. EMF at 60 hertz do not cause cell phone or landline interference. In fact, cell phone transmitter/receiver equipment found on typical cell towers is routinely mounted to transmission line structures in developed areas where space is limited. For similar reasons the transmission line would not affect radio or TV frequencies. In isolated instances loose or damaged conductors or hardware can cause arcing, which can result in broadband interference at close distances. Once reported these issues are easily resolved.	Pamela Mausner, MD
Cultural	East	C & D	Public	ALTERNATIVES C/D Currently, the north transmission line goes almost directly over my next-door neighbor's house. Although it is very close to my house, it is not visually obtrusive for me, because it is downslope from my property. Alternatives C or D would move it further away, but might also mar my view, depending on the exact location of the poles. Even so, my major concern about C and D is not so much the view, but the fate of the old schoolhouse on County Road 18E. The schoolhouse was built in 1910 – so it belongs to an era that was even before my mother's time. The current owners bought it in order to restore it as a historical site. Several years ago, they gave an open house for the community. My mother and I went to the open house, and saw the inside of the building, as well as photographs showing what it looked like when it was still in use as a schoolhouse. Alternatives C or D would likely put an end to the restoration plans. This would harm not only the owners, but all – including myself – who care about remembering the past. How sad it would be to lose this unique historical and cultural resource.	Removal of the section of existing line through the subdivision is part of all alternatives. However, one pole of each structure and a fiber optic ground wire would be left in place to maintain communications with the Bureau of Reclamation operated dam. Alternatives C and D were designed to accomplish the removal of the line in the neighborhood with minimal relocation and maximum use of existing ROW. After consideration of all of the factors Western must take into account, including public input, Alternative B was selected as part of the Agency Preferred Alternative in this area. This alternative would avoid the Pinewood Schoolhouse.	Pamela Mausner, MD

	Section of Route	Alternative	Public or Agency	Comment	Response	Author
Alternative	East	B	Public	ALTERNATIVE B In the Pinewood area, this alternative corresponds to the current south transmission line, running through the ranchlands on the south side of Pinewood Reservoir. As outlined in the group statement, the already-existing RoW is adequate; it is also easy to access because the terrain is relatively flat and open, with few trees. With this alternative, the transmission lines would be a good distance away from our subdivision. Even with the taller steel monopoles, I believe the view from the subdivision and from County Road 18E would be minimally impacted. Understandably, the ranchers do not want Alternative B. However, it is my understanding that the RoWs and transmission lines were already present when they purchased those properties. It's like buying a house near an airport, and then complaining about the noise. Furthermore, to offload the transmission lines onto a new group of landowners (as in Alternative A), who bought their homes with no expectation that this could ever happen, would be extremely unfair. This deeply violates my sense of justice. What's more, some of my friends are among the people who would be most severely impacted by Alternative A – and if they are harmed, then so am I.	After consideration of all of the factors Western must take into account, including public input, Alternative B was selected as part of the Agency Preferred Alternative in this area.	Pamela Mausner, MD
Proposed Project	East	B	Public	For these reasons (as well as those discussed below in my statement about possible health effects), I feel strongly that, for the Pinewood Reservoir area, Alternative B is the only acceptable alternative. The ideal solution would be to bury the lines through the ranchland and open space areas. I understand that the Estes Park end of the project will have buried lines, but this is considered not to be cost effective on the Pinewood end. In that case, I strongly recommend the use of wooden H-frames, rather than steel monopoles, in the ranchland and open space areas. Although taller than the current structures, the H-frames would blend in much better than steel monopoles so that, visually, they would not be much worse than what we have now -- and might even be better, because there would be fewer of them. This would ameliorate the impact on the ranchers, as well as on subdivision residents who may be concerned about having the monopoles in their viewshed.	For a discussion of the rationale used for selecting the Agency Preferred Alternative, please see **Section 2.8** of the Final EIS. An underground alternative for the western end of the Project was not selected. After consideration of all of the factors Western must take into account, including public input, Alternative B was selected as part of the Agency Preferred Alternative in this area. Wood H-frames compromise transmission line reliability and do not meet WAPA's Purpose and Need. Steel monopoles combine long term transmission line reliability with the lowest life cycle cost compared to wood structures. Additionally, visual impact may be reduced based on the longer span length for steel monopoles compared to wood H-frames, roughly 25 percent fewer structures per mile (see **Table 2.2-1**).	Pamela Mausner, MD
Electrical	All	General	Public	POSSIBLE HEALTH EFFECTS OF HIGH-VOLTAGE TRANSMISSION LINES The presence of transmission lines in populated areas raises the issue of possible health effects. When I first learned of the Estes-to-Flatiron Transmission Lines Rebuild Project 2 years ago, I scanned the medical literature and submitted comments to WAPA summarizing what I found. Recently, I updated my previous literature search. Although time limitations do not permit a comprehensive review, I believe I have a good overall impression of where these issues currently stand. In the following comments, I will focus on two persistent concerns: childhood leukemia and interference with cardiac pacemakers.	In addition to text in **Sections 3.14** and **4.14**, EMF is further discussed in **Appendix D**.	Pamela Mausner, MD
Electrical	East	General	Public	Childhood leukemia To summarize: In 2014, it is still unclear whether exposure to high-voltage transmission lines causes childhood leukemia – and, if it does, how far away from the lines the risk extends. Further research is needed to resolve these uncertainties. Meanwhile, the safest course of action is to locate high-voltage transmission lines as far away as feasible from more populated areas. For the Pinewood Reservoir area, this would best be accomplished by choosing Alternative B.	Commenter is correct that 40-odd years of research has not demonstrated a link between EMF exposure and human health effects. While some suggestions of a relationship have been reported, the degree of association has been weak, and study results have not been replicated, a critical factor in scientific proof. The transmission lines would be designed to minimize EMF and would produce electric fields that are 70 percent less at the edge of the ROW than the existing lines, due to the cancellation effects from conductor arrangement on double-circuit lines. Additionally, the new double-circuit line would reduce magnetic field levels to less than the existing H-frame line within a 110-foot-wide ROW. A more detailed description of EMF as they relate to potential health effects is found in **Sections 3.14.1.3** and **4.14.5.1**. Alternative B has been included as part of the Agency Preferred Alternative, but not because of EMF concerns. In addition to text in **Sections 3.14** and **4.14**, EMF is further expounded upon in **Appendix D**.	Pamela Mausner, MD
Electrical	All	General	Public	Cardiac pacemakers and defibrillators It is well known that EMFs at power line frequencies (50-60 Hz) can interfere with pacemakers and defibrillators. Whether or not electromagnetic interference (EMI) occurs depends on numerous variables, including: [THOSE LISTED IN COMMENT] Multiple experts have concluded that, with appropriate pacemaker settings, symptomatic or dangerous EMI due to transmission lines is unlikely to occur in everyday life – but that the possibility cannot be completely ruled out, especially with unipolar pacemakers	As detailed in **Section 4.14.3.5**, the maximum induced electrical field of any of the proposed alternatives is estimated at 0.5 kV/m, well below the estimated interference threshold of 3.4-kV/m. Therefore, with operation at 115 kV, the proposed project would not pose a risk to pacemaker wearers.	Pamela Mausner, MD

	Section of Route	Alternative	Public or Agency	Comment	Response	Author
Alternative		A2	Public	Form Letter - See comment letter 22 The Estes-Flatirons Rebuild will clearly advance our man-made amenities by making our electric power more reliable and fire resistant. The gains in this area, however, may or may not result in a loss of natural amenities. Through WAPA's current plans to consolidate the power lines, fewer intrusions on the natural beauty will occur. By burying the remaining power lines in the Estes Valley, no power lines or power poles will be visible. By following the path they have labeled Variant A2, the clear cutting associated with any of the methods can be moved farther from our transportation routes, residential communities, and recreational areas. Variant A2 gives us clear gains in man-made amenities and enhancements of our natural amenities as well. By taking this opportunity to add value to our community through both better man-made amenities and better display of our natural amenities, WAPA can add value to the Estes Valley in yet another way. The Estes Valley survives economically by hosting millions of guests who are visiting Rocky Mountain National Park. While these guests enjoy the beauty of our natural environment, our shop owners try to make their visits enjoyable, memorable, and restful. By contributing positively to the natural beauty of the Estes Valley, WAPA will contribute to our guests' experiences and to the economic health of the Estes Valley. This can best be accomplished by modernizing our electric transmission using Variant A2, as that minimizes the barriers to the natural beauty and the disruption of our neighborhoods. It seems fair that we citizens of the Estes Valley share with WAPA's other electric service recipients in the costs of having high quality electric service. It also seems fair that all of WAPA's customers share as equally as possible in minimizing the environmental costs of providing their service. By undergrounding the Estes-Flatirons transmission lines using Variant A2 and sharing that extra cost with all affected regional electric customers, WAPA can improve the nature experience of millions of Americans and treat the citizens of the Estes Valley equitably at a monthly cost per customers that is very low. In summary, I ask that you encourage WAPA to enhance the natural beauty of the Estes Valley, add to the economic health of the Estes Valley, and treat its regional customers fairly through embracing Variant A2. If Variant A2 is simply not possible, the next best method for accomplishing these goals is best through Alternative A.	Commenter correctly states that the proposed project would improve reliability and reduce risk of wildfire-relayed outages, but at the cost of some impact to environmental resources. Removal of one line and abandonment of the existing ROW would allow that line route to revert back to natural vegetation and eventually merge with the rest of the area, and that aspect of the proposed Project is thus a tangible improvement to the Estes Park vicinity. Other adjustments to the line route as included in the Agency Preferred Alternative would also reduced existing impacts, especially visual. The pros and cons of underground vs. overhead lines result in several tradeoffs, as fully discussed in **Section 2.8**. This section presents the rationale that led to the selection of the Agency Preferred Alternative. Western must carefully consider the costs of its projects, as all costs are recovered in the wholesale power rates it charges its utility customers, and not through tax dollars. In joint participation projects where Western partners with other utilities, the partners must recover their investment through their rates, typically retail rates to end users such as the residents of Estes Park. The costs of this Project would be similarly recovered and would be, therefore, similarly spread to ratepayers directly or indirectly.	Kathy Moran
General	East	General	Public	Background and Premise: 1. There are two existing power transmission lines in service near the Flatiron substation and Pinewood Reservoir. One line runs roughly on the north side of County Road 18E, and is referred as the "north" line. The second line runs roughly on the south side of the same road and is referred as the "south" line. These two transmission lines run along rights-of-way (ROWs) that have been established and used in their present location for decades, since the 1930's and 1950's. They should be reused for the transmission line rebuild to the greatest extent. Utilization of existing ROWs is beneficial for a variety of reasons, among them: - It is more efficient and allows faster progress for the rebuild effort; - Cost is typically much less than acquiring new ROWs; - Potential litigation and other delays from newly affected landowners is minimized.	Western's proposed alternatives maximize the use of existing ROWs. Other alternatives are the result of specific resource conflicts or public input. The Agency Preferred Alternative does make use of the existing ROWs, but also recognizes conditions have changed since the lines were constructed.	Pinewood Community
Socioeconomics	All	A	Public	Arguments Against Alternative A: 2. Alternative A seeks to deviate from the existing, long-established ROWs. Property owners over the years have purchased land, planned, built homes/structures and otherwise developed their land based on these longtime established ROWs. Abandoning these ROWs and now imposing new easements causes severe, undue and unnecessary harm on a new set of landowners.	Members of the public at the routing workshops hosted by Western identified Alternative A as an option they wanted Western to analyze. Western did so, and found a number of issues with access, steep slopes, and constructability, among others. Alternative A was not selected to be a part of the Agency Preferred Alternative. Alternative B on the east end of the proposed Project has been included as part of the Agency Preferred Alternative.	Pinewood Community
Socioeconomics	All	A	Public	3. Acquiring new ROWs along Alternative A is more costly and timeconsuming than using the existing ROWs of the "north" and "south" lines, resulting in slower and more expensive progress. Per WAPA, PVREA customers will bear these costs as higher electric bills.	Members of the public at the routing workshops hosted by Western identified Alternative A as an option they wanted Western to analyze. Western did so, and found a number of issues with access, steep slopes, and constructability, among others. Alternative A was not selected to be a part of the Agency Preferred Alternative. Alternative B on the east end of the proposed Project has been included as part of the Agency Preferred Alternative.	Pinewood Community
Transportation	All	A	Public	4. Alternative A would traverse extremely steep terrain. The steep terrain would make ROWs and access roads difficult to create, expensive to maintain, and subject to severe erosion. Snow cover on the steeper sections of these roads would make navigation of maintenance vehicles difficult or impossible. Transmission line maintenance would likely have to be excluded during winter months. More troubling is that essential or emergency repairs during winter months may be especially hampered by the steep, snow-covered access roads.	Members of the public at the routing workshops hosted by Western identified Alternative A as an option they wanted Western to analyze. Western did so, and found a number of issues with access, steep slopes, and constructability, among others. Alternative A was not selected to be a part of the Agency Preferred Alternative. Alternative B on the east end of the proposed Project has been included as part of the Agency Preferred Alternative.	Pinewood Community

	Section of Route	Alternative	Public or Agency	Comment	Response	Author
Accidents	All	A	Public	5. Alternative A would pass through thickly forested areas. Sources of ignition – from maintenance activities or the transmission lines themselves – could easily ignite a tinder-dry forested area.	Members of the public at the routing workshops hosted by Western identified Alternative A as an option they wanted Western to analyze. Western did so, and found a number of issues with access, steep slopes, and constructability, among others. Western would continue to utilize long-established safety practices during construction, operation, and maintenance of any alternative to ensure adequate protection against fire hazards. The new steel poles, coupled with new conductors and more modern design standards would also enhance fire safety. More information on fire management is located in **Section 4.7.3.3** Fuels and Fire Management. Alternative A was not selected to be a part of the Agency Preferred Alternative. Alternative B on the east end of the proposed Project has been included as part of the Agency Preferred Alternative.	Pinewood Community
Accidents	All	A	Public	6. There are many residences within tens of feet of Alternative A's routing. Even more residences and structures are within a quarter-mile of the proposed routing. The resulting liability from fire losses could be very significant. This liability would be compounded by WAPA's decision to deliberately and knowingly favor Alternative A, while a less fire-prone, less steep, less inhabited and more accessible option exists, such as the "south" ROW.	Members of the public at the routing workshops hosted by Western identified Alternative A as an option they wanted Western to analyze. Western did so, and found a number of issues with access, steep slopes, and constructability, among others. Alternative A was not selected to be a part of the Agency Preferred Alternative. Alternative B on the east end of the proposed Project has been included as part of the Agency Preferred Alternative.	Pinewood Community
Alternative	East	B	Public	Arguments For Alternative B (with two options): 7. Alternative B is the preferred choice for the transmission line rebuild near the Flatiron – Pinewood Reservoir area. It re-uses the existing "south" ROW that has been in service for decades. Over the years, stakeholders have purchased land and developed their properties based on the location of this ROW.	Western selected Alternative B as part of the Agency Preferred Alternative in this area. See **Section 2.8** of the Final EIS for the rationale for the Agency Preferred Alternative.	Pinewood Community
Alternative	East	B	Public	8. Alternative B uses the "south" ROW near the Flatiron substation, which already has adequate width to meet current standards. Costs are minimized since the acquisition of additional ROWs is not necessary.	Western selected Alternative B as part of the Agency Preferred Alternative in this area. See **Section 2.8** of the Final EIS for the rationale for the Agency Preferred Alternative.	Pinewood Community
Alternative	All	B	Public	9. Table S4, "Measurement Indicators for Key and Other Issues", outlined in the draft Environmental Impact Statement (EIS), consistently shows Alternative B to have the smallest adverse impact on stakeholders. For example: Alternative B affects the fewest landowners (19 vs. 36-48); and fewest acres of new ROW acquisition (42 vs. 110-177). Alternative B also has the highest positive effect for the number of landowners with ROWs to be decommissioned (51 vs. 7-36). Totaling all line items in Table S4, Alternative B has 19 favorable outcomes. The nearest competitor is Alternative C1 at 11 favorable outcomes, while the undesirable Alternative A has only 8 favorable outcomes. Alternative B is clearly the best choice, according to Table S4.	Western selected Alternative B as part of the Agency Preferred Alternative in this area. See **Section 2.8** of the Final EIS for the rationale for the Agency Preferred Alternative.	Pinewood Community
Alternative	East	B	Public	10. Alternative B benefits the many landowners in the Newell Lake subdivision by decommissioning the transmission lines through the subdivision and along County Rd 18E.	Western selected Alternative B as part of the Agency Preferred Alternative in this area. See **Section 2.8** of the Final EIS for the rationale for the Agency Preferred Alternative.	Pinewood Community
Accidents	East	B	Public	11. WAPA's assumed risk and liability from fire hazard is minimized with the choice of Alternative B. The "south" ROW between the Flatiron substation and Pinewood reservoir is not in a forested area, has fewer at-risk structures and consists mostly of grasses and low-growing shrubs. Ignition sources are less likely to cause a wildfire outbreak, and tree canopy fires could not form. The proximity of County Road 18E provides easy access for firefighting ground equipment, and easy access to the transmission line. This choice compares very favorably to other alternatives that are routed through steep, inaccessible terrain with forested landscapes.	Western selected Alternative B as part of the Agency Preferred Alternative in this area. See **Section 2.8** of the Final EIS for the rationale for the Agency Preferred Alternative.	Pinewood Community
Visual	East	B	Public	12. An Option: Alternative B passes by the south end of Pinewood Reservoir, through an area some refer to as "Rattlesnake Park". The visual impact from Alternative B can be reduced with the use of wooden H-frame structures that can support a double circuit, contrary to what is stated in the draft EIS, page 2-41: 2.7.2 Alternative Structure Types In addition to routing options, alternative project designs were considered and presented during the public workshops held in October 2012. Other structure types considered included a lattice structure and double-circuit H-frame. Neither the lattice nor double-circuit H-frame designs were supported by public comments, and were not carried forward for further analysis. The wooden double-circuit H-frame designs would be far less objectionable than the steel monopoles.	Double circuit wood H-frames compromise transmission line reliability and do not meet WAPA's Purpose and Need. Steel monopoles combine long term transmission line reliability with the lowest life cycle cost compared to wood structures. Additionally, visual impact may be reduced based on the longer span length for steel monopoles compared to wood H-frames, roughly 25 percent fewer structures per mile (see **Table 2.2-1**).	Pinewood Community

	Section of Route	Alternative	Public or Agency	Comment	Response	Author
Alternative	West	B	Public	13. A Second Option: Add a Variant to Alternative B that includes underground burial of the transmission line through "Rattlesnake Park". This is analogous to the Variant C1, in which the westernmost 2.7 mile section near Lake Estes is constructed underground. Stakeholders on the eastern end should receive equivalent consideration for this option as are stakeholders on the western end.	For the reasons given in **Section 2.8** of the Final EIS, underground options were not selected as part of the Agency Preferred Alternative at either end of the proposed Project.	Pinewood Community
Land Use and Recreation	West	A-2 & C-1	Agency-Upper Thompson Sanitation District	The District strongly supports the A-2/C-1 Variant identifying a proposed WAPA transmission line below ground just south of the Bureau of Reclamation (BOR) Siphon. As you are aware, the District's wastewater treatment plant is located on Bureau of Reclamation land west of Mall Road, with WAPA utility easements along the northwest portion of the parcel. The transmission line also travels across the lower portion of District property east of Mall Road. The District's Master Plan identifies expansion of the treatment facility, installation of additional piping and concrete structures or basins (covered or uncovered). As shown on the enclosed Figure 1 – District Facility Map, future District expansion would be severely encumbered by existing overhead transmission lines shown as proposed above ground ALT A and existing above ground ALT D. The proposed re-route of the transmission line would, therefore, allow the District to utilize available vacant areas of both BOR parcels and District owned property, and thereby eliminate any potential encroachment of the easement.	The underground alternatives (A2 and C1) were analyzed for cost and other purpose and need factors. See **Section 2.2.4** for analysis. Additionally, Western anticipates that potential conflicts with the Upper Thompson Sanitation District would be minimal and could be accommodated through careful micro-siting in this area. With the selection of Alternative C as part of the Agency Preferred Alternative, the existing line would be removed and there would be no conflict with the Upper Thompson Sanitation District's expansion plans.	Upper Thompson Sanitation District
General	West	A-2 & C-2	Agency-Upper Thompson Sanitation District	It is the desire of the District to partner with WAPA in support of the Estes-Flatiron Rebuild Project, identifying strategies and solutions which provide mutual benefit. Through careful examination of current and projected needs, equitable solutions may be identified, benefiting the entire Estes Valley and enhancing environmental protection efforts.	Comment noted. Western has been discussing the proposed Project with the Upper Thompson Sanitation District during the course of the EIS process and the effects of the alternatives on the facility were analyzed in the Final EIS.	Upper Thompson Sanitation District
Alternative		A-2 & C-3	Agency-Upper Thompson Sanitation District	Upper Thompson Sanitation District fully endorses the proposed re-route of WAPA transmission lines and considers it critical in nature to providing future sanitation service for the greater Estes Valley. The District therefore respectfully requests WAPA consider the A-2/C-1 variant as described in the Draft EIS. We look forward to continued cooperation of our respective entities and collaborative efforts in delivering exceptional service to customers of the Estes Valley, both now and in the future.	The underground alternatives (A2 and C1) were analyzed for cost and other purpose and need factors. See **Section 2.2.4** for analysis. Additionally, Western anticipates that potential conflicts with the Upper Thompson Sanitation District would be minimal and could be accommodated through careful micro-siting in this area. With the selection of Alternative C as part of the Agency Preferred Alternative, the existing line would be removed and there would be no conflict with the Upper Thompson Sanitation District's expansion plans.	Upper Thompson Sanitation District
Alternative		A-2 & C-3	Agency-Upper Thompson Sanitation District	Duplicate, see comment letter 78 The District strongly supports the A-2/C-1 Variant identifying a proposed WAPA transmission line below ground just south of the Bureau of Reclamation (BOR) Siphon. As you are aware, the District's wastewater treatment plant is located on Bureau of Reclamation land west of Mall Road, with WAPA utility easements along the northwest portion of the parcel. The transmission line also travels across the lower portion of District property east of Mall Road. The District's Master Plan identifies expansion of the treatment facility, installation of additional piping and concrete structures or basins (covered or uncovered). As shown on the enclosed Figure 1 – District Facility Map, future District expansion would be severely encumbered by existing overhead transmission lines shown as proposed above ground ALT A and existing above ground ALT D. The proposed re-route of the transmission line would, therefore, allow the District to utilize available vacant areas of both BOR parcels and District owned property, and thereby eliminate any potential encroachment of the easement. It is the desire of the District to partner with WAPA in support of the Estes-Flatiron Rebuild Project, identifying strategies and solutions which provide mutual benefit. Through careful examination of current and projected needs, equitable solutions may be identified, benefiting the entire Estes Valley and enhancing environmental protection efforts. Upper Thompson Sanitation District fully endorses the proposed re-route of WAPA transmission lines and considers it critical in nature to providing future sanitation service for the greater Estes Valley. The District therefore respectfully requests WAPA consider the A-2/C-1 variant as described in the Draft EIS. We look forward to continued cooperation of our respective entities and collaborative efforts in delivering exceptional service to customers of the Estes Valley, both now and in the future.	The underground alternatives (A2 and C1) were analyzed for cost and other purpose and need factors. See Section 2.2.4 for analysis. Additionally, Western anticipates that potential conflicts with the Upper Thompson Sanitation District would be minimal and could be accommodated through careful micro-siting in this area. With the selection of Alternative C as part of the Agency Preferred Alternative, the existing line would be removed and there would be no conflict with the Upper Thompson Sanitation District's expansion plans.	Upper Thompson Sanitation District

	Section of Route	Alternative	Public or Agency	Comment	Response	Author
Alternative		A2	Public	Form Letter - See comment letter 22 The Estes-Flatirons Rebuild will clearly advance our man-made amenities by making our electric power more reliable and fire resistant. The gains in this area, however, may or may not result in a loss of natural amenities. Through WAPA's current plans to consolidate the power lines, fewer intrusions on the natural beauty will occur. By burying the remaining power lines in the Estes Valley, no power lines or power poles will be visible. By following the path they have labeled Variant A2, the clear cutting associated with any of the methods can be moved farther from our transportation routes, residential communities, and recreational areas. Variant A2 gives us clear gains in man-made amenities and enhancements of our natural amenities as well. By taking this opportunity to add value to our community through both better man-made amenities and better display of our natural amenities, WAPA can add value to the Estes Valley in yet another way. The Estes Valley survives economically by hosting millions of guests who are visiting Rocky Mountain National Park. While these guests enjoy the beauty of our natural environment, our shop owners try to make their visits enjoyable, memorable, and restful. By contributing positively to the natural beauty of the Estes Valley, WAPA will contribute to our guests' experiences and to the economic health of the Estes Valley. This can best be accomplished by modernizing our electric transmission using Variant A2, as that minimizes the barriers to the natural beauty and the disruption of our neighborhoods. It seems fair that we citizens of the Estes Valley share with WAPA's other electric service recipients in the costs of having high quality electric service. It also seems fair that all of WAPA's customers share as equally as possible in minimizing the environmental costs of providing their service. By undergrounding the Estes-Flatirons transmission lines using Variant A2 and sharing that extra cost with all affected regional electric customers, WAPA can improve the nature experience of millions of Americans and treat the citizens of the Estes Valley equitably at a monthly cost per customers that is very low. In summary, I ask that you encourage WAPA to enhance the natural beauty of the Estes Valley, add to the economic health of the Estes Valley, and treat its regional customers fairly through embracing Variant A2. If Variant A2 is simply not possible, the next best method for accomplishing these goals is best through Alternative A.	Commenter correctly states that the proposed project would improve reliability and reduce risk of wildfire-relayed outages, but at the cost of some impact to environmental resources. Removal of one line and abandonment of the existing ROW would allow that line route to revert back to natural vegetation and eventually merge with the rest of the area, and that aspect of the proposed Project would be a tangible improvement to the Estes Park vicinity. Other adjustments to the line route as included in the Agency Preferred Alternative would also reduce existing impacts, especially visual. The pros and cons of underground vs. overhead lines result in several tradeoffs, as fully discussed in **Section 2.8**. This section presents the rationale that led to the selection of the Agency Preferred Alternative. Western must carefully consider the costs of its projects, as all costs are recovered in the wholesale power rates it charges its utility customers, and not through tax dollars. In joint participation projects where Western partners with other utilities, the partners must recover their investment through their rates, typically retail rates to end users such as the residents of Estes Park. The costs of this Project would be similarly recovered and would be, therefore, similarly spread to ratepayers directly or indirectly.	Tom Vogelsang
Alternative		A2	Public	Form Letter - See comment letter 23	Commenter correctly states that the proposed project would improve reliability and reduce risk of wildfire-relayed outages, but at the cost of some impact to environmental resources. Removal of one line and abandonment of the existing ROW would allow that line route to revert back to natural vegetation and eventually merge with the rest of the area, and that aspect of the proposed Project would be a tangible improvement to the Estes Park vicinity. Other adjustments to the line route as included in the Agency Preferred Alternative would also reduce existing impacts, especially visual. The pros and cons of underground vs. overhead lines result in several tradeoffs, as fully discussed in **Section 2.8**. This section presents the rationale that led to the selection of the Agency Preferred Alternative. Western must carefully consider the costs of its projects, as all costs are recovered in the wholesale power rates it charges its utility customers, and not through tax dollars. In joint participation projects where Western partners with other utilities, the partners must recover their investment through their rates, typically electrical power rates to end users such as the residents of Estes Park. The costs of this Project would be similarly recovered and would be, therefore, similarly spread to ratepayers directly or indirectly.	Carol Barsch Bontrager
Alternative	All	A	Public	My comments are directed to an alternative to remove the eight miles of the wood pole and wires that comprise A -- excuse me B, C, and D from consideration and select A as the form on the north side, everything on the north side of County Road 18E from Flatiron Reservoir to Pole Hill Road to the substation.	Thank you for your comment.	Russell Atwood
All	All	B,C,D	Public	By removing Alternatives B, C, and D, it would resolve most of the key issues that have been raised in this pamphlet and the issues that most of you have.	Thank you for your comment. Unless an alternative can be dismissed due to reasons such as feasibility or technical issues, it must be evaluated in the EIS.	Russell Atwood
Socioeconomics	East		Public	If the proponents are successful, a new and innocent group of landowners, those along the proposed Alternative A route, would be burdened with new easements on their land. They would bear the cost in the form of new rights of way, and they would suffer from the diminished scenic value of their property. This amounts to an illegitimate transfer of property restrictions from one group of landowners to another group of landowners.	Alternative A was not selected as part of the Agency Preferred Alternative in this area.	Jeff Barina
All	East	B	Public	The solution is Alternative B. Alternative B uses the south right of way, a long-established easement familiar to and accepted by the landowners in the area. It successfully removes the north right of way from the property of most proponents and increases their land values. It does not transfer property restrictions to a new innocent set of landowners.	Western selected Alternative B as part of the Agency Preferred Alternative in this area. See **Section 2.8** of the Final EIS for the rationale for the Agency Preferred Alternative.	Jeff Barina

	Section of Route	Alternative	Public or Agency	Comment	Response	Author
Socioeconomics	East		Public	The remaining issue of protecting scenic views is important but should not be paid for on the backs of other innocent, private lndowners. Those landowners 5 are not even adjacent to this open space. Instead, the cost of protecting scenic views for the public lands, which is a benefit, should be paid for by the public. One suggestion is to use double-circuit wooden H-frame structures to minimize visual impacts to the scenic view. This is less expensive and much preferred to the steel monopoles.	Double circuit wood H-frames compromise transmission line reliability and don't meet WAPA's Purpose and Need. Steel monopoles combine long term transmission line reliability with the lowest life cycle cost compared to wood structures. Additionally, visual impact may be reduced based on the longer span length for steel monopoles compared to wood H-frames, roughly 25 percent fewer structures per mile (see **Table 2.2-1**).	Jeff Barina
Socioeconomics	East		Public	Another suggestion is using public funds, perhaps through park fees, Great Outdoors Colorado grants, or other means to help fund underground construction through the public open space areas.	Partial public funding is complicated by regulations governing Western's acceptance of funds from the public; legislation would likely be required to do this. Lacking public or appropriated funding from Congress, electrical power rates (either Western's wholesale power rates or participating utilities retail consumer rates) would pay for the proposed Project.	Jeff Barina
Alternative	East	A & B	Public	So for background and premise, there are two existing power transmission lines in service near the Flatiron substation in Pinewood Reservoir. One line runs roughly on the north side -- excuse me -- north side of County Road 18E and is referred to as the north line. The second line runs roughly on the south side of the sameroad and is referred to as the south line. 2 These two transmission lines run along rights of way that have been established and used in their present locations since the 1930s and 1950s. They should be reused for the transmission line rebuild to the greatest extent. Utilization of existing rights of way is beneficial for a variety of reasons. Among them, it's more efficient and allows faster progress for the rebuild effort. Cost is typically much less than acquiring new rights of way. Potential litigation and other delays from newly affected landowners is minimized.	Western's proposed alternatives maximize the use of existing ROWs. Other alternatives are the result of specific resource conflicts or public input.	Jeff Barina
Alternative	East	A	Public	The following arguments are for -- are against Alternative A. Alternative A seeks to deviate from the existing, long-established rights of way. Property owners over the years have purchased land, planned, built homes and structures, or otherwise developed their land based on these long-time established rights of way. Abandoning these rights of way and now imposing new easements causes severe, undue, and unnecessary harm on a new set of landowners.	Western analyzed Alternative A and found a number of issues with access, steep slopes, and constructability, among others. Alternative A was not selected to be a part of the Agency Preferred Alternative. Alternative B on the east end of the proposed Project has been included as part of the Agency Preferred Alternative.	Jeff Barina
Alternative	East	A	Public	Acquiring new rights of way along Alternative A is more costly and time consuming than using the existing rights of way, the north and south lines, resulting in slower and more expensive progress. Per Western Power, the PBERA customers would bear the cost of these higher electric -- in the form of higher electric bills.	Alternative A was not selected as part of the Agency Preferred Alternative in this area.	Jeff Barina
Transportation	East	A	Public	Alternative A would traverse extremely steep terrain. The steep terrain would make rights of way and access roads difficult to create, expensive to maintain, and subject to severe erosion. Snow cover on the steeper sections of these roads will make navigation and maintenance vehicles difficult or impossible. Transmission line maintenance -- excuse me. Transmission line maintenance would likely have to be excluded during winter months. More troubling is that essential or emergency repairs during winter months may be especially hampered by the steep snow-covered access roads.	Western analyzed Alternative A and found a number of issues with access, steep slopes, and constructability, among others. Alternative A was not selected to be a part of the Agency Preferred Alternative. Alternative B on the east end of the proposed Project has been included as part of the Agency Preferred Alternative.	Jeff Barina
Accidents	East	A	Public	Alternative A would pass through thickly forested areas, sources of ignition from maintenance activities. Transmission lines themselves could easily ignite a tinder dry-forested area. There are many residences within tens of feet of Alternative A's routing. Even more residences or construction are within a quarter-mile of the proposed route. The resulting liability from losses could be very significant.	Western analyzed Alternative A and found a number of issues with access, steep slopes, and constructability, among others. Alternative A was not selected to be a part of the Agency Preferred Alternative. Alternative B on the east end of the proposed Project has been included as part of the Agency Preferred Alternative.	Jeff Barina
Alternative	East	B	Public	A less liable, much safer and smarter alternative exists with Alternative B. The following are arguments for Alternative B. Alternative B is the preferred choice for the transmission line rebuild near the Flatiron Pinewood Reservoir area. It reuses the existing south right of way that has been in service for decades. Over the years, stakeholders have purchased land and developed their properties based on the location of this right of way. Alternative B uses the south right of way near the Flatiron substation which already has adequate width to meet current standards. Costs are minimized since the acquisition of additional rights of way are not necessary.	Western selected Alternative B as part of the Agency Preferred Alternative in this area. See **Section 2.8** of the Final EIS for the rationale for the Agency Preferred Alternative.	Jeff Barina

	Section of Route	Alternative	Public or Agency	Comment	Response	Author
Alternative	East	B	Public	If you look at the table and you total all the line items in Table S-4, Alternative B has 19 favorable outcomes. The nearest competitor is Alternative C-1 and only 11 favorable outcomes, while the undesirable Alternative A has only 8 favorable outcomes. Alternative B is clearly the best choice according to Table S-4. Alternative B benefits the many landowners in the Newell Lake subdivision by decommissioning the transmission lines through the subdivision along County Road 18E. WAPA's assumed risk and liability from fire hazard is minimized with the choice of Alternative B. The south right of way between Flatiron substation and Pinewood Reservoir is not in the forested area, has fewer at-risk structures, and consists mostly of grass and low-growing shrubs. Ignition sources are less likely to cause a wildfire outbreak, and tree canopy fires could not form. The proximity of County Road 18E provides easy access for firefighting ground equipment and easy access to the transmission lines. This choice compares very favorably to other alternatives that are routed through steep, inaccessible terrain with forested landscapes.	Western selected Alternative B as part of the Agency Preferred Alternative in this area. See **Section 2.8** of the Final EIS for the rationale for the Agency Preferred Alternative.	Jeff Barina
Visual	East	B	Public	An option: Alternative B passes by the south end of Pinewood Reservoir through an area some refer to as Rattlesnake Park. The visual impact from Alternative B can be reduced with the use of wooden H-frame structures that can support a double circuit, contrary to what is stated in the Draft EIS on Page 421.	Double circuit wood H-frames compromise transmission line reliability and don't meet WAPA's Purpose and Need. Steel monopoles combine long term transmission line reliability with the lowest life cycle cost compared to wood structures. Additionally, visual impact may be reduced based on the longer span length for steel monopoles compared to wood H-frames, roughly 25 percent fewer structures per mile (see **Table 2.2-1**).	Jeff Barina
Alternative	East	B	Public	A second option: A variant to Alternative B that includes underground burial of the transmission lines through Pinewood Reservoir County Park, which is also known as Rattlesnake Park. This is analogous to the Variant C-1 in which the westernmost 2.7-mile section near Lake Estes is constructed underground. Stakeholders on the eastern end should receive equivalent consideration for this option as stakeholders on the western end.	**Section 2.8** of the Final EIS describes the methods and considerations for choosing the Preferred Alternative. For the reasons discussed there, no underground options were included in the Agency Preferred Alternative.	Jeff Barina
Land Use and Recreation	West	General	Public	I just want the trails -- I don't want it to change or anything. I just want the normal trail on Pole Hill. That's it.	West Pole Hill Road would be improved under Alternatives C and C1 resulting in beneficial and adverse impacts as detailed in **Section 4.16**. As part of the APA there would be no change to the road , and subsequently no related long-term change to recreation attributable to the proposed Project. Under the APA, short-term impacts would include temporary congestion or blockage of the road by construction vehicles during certain phases of construction. These impacts should be of limited duration, primarily occurring when construction equipment is accessing or leaving structure locations, or during conductor stringing.	Kaylee Beach
Cultural	All	C, D	Public	In talking with Western Power representatives, we have discovered that if the new -- if the new structures described in the EIS under Alternative D and possibly Alternative C are put into place, we could lose most of the land on which the schoolhouse sits due to the size of the right of way needed, especially if the structure is a turret pole which requires even a larger footprint. The Western Power representatives explained that if this happens, we would be given a severance payment for the amount of land rendered unusable. But how do you put a price on history?	Western selected Alternative B as part of the Agency Preferred Alternative in this area. See **Section 2.8** of the Final EIS for the rationale for the Agency Preferred Alternative.	Gib Coalwell
Cultural	East	C, D	Public	As required, Western Power looked into the impact of its proposal on historical structures in the area, but we do not believe the agency did its due diligence. To begin with, the EIS contains inaccurate information. On Page 1-5 of the EIS Western Power states: It should be noted that both the existing transmission line right of ways were in place prior to these neighborhood developments. The homes were built with the existing transmission lines in place. That information is incorrect. The schoolhouse was in place long before the right of ways were procured and the transmission lines were put into place. The current north line which runs approximately 300 feet north of the schoolhouse was constructed 28 years later after the schoolhouse was built.	Text has been revised to state that most but not all of the existing development occurred after the transmission lines were constructed.	Gib Coalwell
Cultural	East	C, D	Public	Furthermore, the agency looked at the schoolhouse not once but twice but could not -- excuse me -- could not rule out the historical significance. See Page 3-124 for details. While labeling several sites as "determined not eligible" for the National Register of Historic Places, the EIS states the schoolhouse is recommended as not eligible, most likely due to the agency's finding that no National Register of Historic Places assessment had been found. We're now in the process of changing that. After seeing Western Power could not -- after seeing that Western Power could not definitively say the schoolhouse was not eligible for the National Register of Historic Places status, we looked into the matter, and we found that the building could easily qualify under the rural school buildings of Colorado designation, which is part of a multi-property listing type defined as a series of individual and/or districts listings of thematically related historic properties. ...we are currently in the process of submitting the Pinewood schoolhouse to be listed in the National Register of Historic Places and the Colorado State Register of Historic Properties.	As detailed in the Addendum report, Western has made the determination that the Pinewood Schoolhouse is not eligible, and the Colorado State Historic Preservation Office (SHPO) has concurred. This determination is based on modifications to its original construction over the years that that have resulted in the structure no longer retaining sufficient integrity, as defined in 36 CFR 60, to be included in National Register of Historic Places. Since the Colorado SHPO has determined that the schoolhouse is not eligible, it is also not eligible for the Colorado State Register of Historic Properties. Western is aware of the owners' plans to restore the Pinewood Schoolhouse, and does not dispute that the property has historical interest.	Gib Coalwell

	Section of Route	Alternative	Public or Agency	Comment	Response	Author
Cultural	East	C, D	Public	We would like to point out that the EIS Western -- that in the EIS, Western Power does refer to historical significance as a reason to avoid placing the lines. On Page S-12 of the EIS summary, you can read about how an alternative route that would have run along the Flatiron's penstocks was dropped in part because, quote, the penstocks are iconic facilities that date to the 1940s and have significant -- and has historic significance, end quote.	The structural modifications that have occurred to the Pinewood School have resulted in diminished integrity as defined in 36 CFR 60 National Register of Historic Places. Therefore, the Colorado SHPO concurred that the property was not eligible for inclusion on either the Federal or State Register of Historic Places. Furthermore, while the historical significance of the penstocks was considered, additional rationale for not moving forward with additional analysis was the lack of opportunities for visual concealment provided by the surrounding terrain. Both of these rationale provided the justification for dismissing this alternative from further analysis.	Gib Coalwell
Cultural	East	C, D	Public	With all due respect to the silver pipes, we believe the 1910 schoolhouse has much more iconic appeal and historic significance. In addition, we have found no mention of the penstocks as being eligible for the National Register of Historic Places. So why did Western Power describe them as having historic significance and use that criteria as a means to drop that proposed alternative route when it did not give the same consideration to the schoolhouse?	The fact that Alternatives C and D were fully analyzed does not mean that the Pinewood Schoolhouse was ignored. Indeed, it was one of the factors that led to Alternative B being selected for inclusion in the Agency Preferred Alternative. The penstocks and associated facilities are not listed in the NRHP register (See **Tables 3.15-1** and **3.15-2)**. There were other factors considered in dismissing the alternative near the Flatiron Penstocks from further analysis.	Gib Coalwell
Cultural	All	C, D	Public	To further solidify their argument against Alternative C and D, on Page 4-146 of the EIS, the EIS states that both alternatives have a greater number of historical properties encountered than the other proposals. Option C would affect nine historic sites while Alternative D would affect 12 such sites. So we respectfully ask that Western Power consider dropping both Alternative C and D.	All potential alternatives have impacts, and only those that are clearly not reasonable or feasible, do not meet the purpose and need for action, or have unacceptable levels of impact even at the conceptual level are eliminated from full analysis. Others that do meet these criteria are fully analyzed for their effects in order to make an informed decision. However, they may not be selected because of the effects analysis and agency purpose and need, and in this case Western has selected Alternative B as part of its Agency Preferred Alternative in the vicinity of the schoolhouse.	Gib Coalwell
Alternative	All	C, D	Public	In closing, we wish to add that while we strongly oppose C and D, we believe that Alternative A is equally unfeasible as backed by arguments that you will hear from our neighbors in that area. Alternative B where the power lines and the 100-foot right of way already exists seems to be the most feasible and logical choice.	Western selected Alternative B as part of the Agency Preferred Alternative in this area. See **Section 2.8** of the Final EIS for the rationale for the Agency Preferred Alternative.	Gib Coalwell
Land Use and Recreation	All	General	Public	One issue we've seen mainly with off-road trails and OHV areas is whenever work is done, they go in and grade them smooth. There's a significant increase in accidents, people getting injured, additional resource damage from increased traffic.	West Pole Hill Road would be improved under Alternatives C and C1 resulting in both beneficial and adverse impacts as detailed in **Section 4.16**. However, under the Agency Preferred Alternative, Western's decision not to upgrade the 4WD section of Pole Hill Road would leave access and forest recreation use unchanged. Leaving the 4WD section of Pole Hill Road unimproved would leave that barrier to public access unchanged, so no increase in public access and related recreational use attributable to the proposed Project would occur.	James Dixon
Land Use and Recreation	All	General	Public	Leaving the four-wheel drive trails the way that they are currently reduces the speed, reduces the environmental impact from use. Close them down and it increases traffic on other trails, creates more resource damage there. We would just like to see our trails left the way they are and not damaged to where it creates more headaches later for everyone and then more trails getting closed because of accidents, injuries, and even in some cases fatalities.	West Pole Hill Road would be improved under Alternatives C and C1 resulting in both beneficial and adverse impacts as detailed in **Section 4.16**. However, under the Agency Preferred Alternative Western has determined that it would not upgrade the 4WD section of Pole Hill Road. Other roads may be improved to allow access for construction.	James Dixon
Alternative	East	B	Public	Many people in our community support Alternative B. The advantages are many. The south right of way was built in 1953. It is currently sufficiently wide for transmission lines in an open area. In the area, no more additional easement will need to be acquired for the installation of these modern transmission lines. It's already 100-foot wide. That's plenty wide. For more than half a century, landowners have purchased and developed their property around the south right of way. Land was purchased with the full knowledge and acceptance of the right of ways and structures. Most of the existing structures are outside of the 300-foot buffer zone. In Pinewood Reservoir area, the terrain is open and relatively flat. Because so much of it is ranchland, vegetation along the right of way consists of grasses and low shrubs. When necessary, it has already been cleared and maintained. There is easy access for installation and maintenance of the transmission lines and structures. There is no need for additional access roads. Given the longer spans of the new structure, perhaps some of the access roads can be abandoned and returned to their original condition. The open terrain will require minimum of roads, easy maintenance costs, and limiting the danger -- the damage caused by roads.	Western selected Alternative B as part of the Agency Preferred Alternative in this area. See **Section 2.8** of the Final EIS for the rationale for the Agency Preferred Alternative.	Craig Driear
Accidents	All	B	Public	WAPA's assumed risk and liability from fire is minimized with Alternative B in the area. Ignition sources from lines themselves or from other causes will have minimal potential to cause fire compared to the other alternatives. In the unfortunate event of a fire, firefighters will have easy year-round access to provide protection to homes and buildings as well as the lines themselves. Due to the general lack of trees, canopy fire dangers are minimized.	Western selected Alternative B as part of the Agency Preferred Alternative in this area. See **Section 2.8** of the Final EIS for the rationale for the Agency Preferred Alternative.	Craig Driear
Alternative	All	B	Public	...for the sake of you folks listening, we can summarize by saying there are 19 advantages to Alternative B listed in Table 2.8-1, more than any of the other alternatives. We feel that Alternative B as currently proposed is the least bad alternative. However, there are two variants that would further improve Alternative B. Variant 1. Where required to ease the visual impact, wooden double-circuit H-frames can be used instead of the steel monopoles.	Double-circuit wood-pole H-frames structures are not a viable option as a result of the short ruling span, fire risk, increased visual impact, and increased maintenance. Western selected Alternative B as part of the Agency Preferred Alternative in this area. See **Section 2.8** of the Final EIS for the rationale for the Agency Preferred Alternative.	Craig Driear

	Section of Route	Alternative	Public or Agency	Comment	Response	Author
Visual	East	B	Public	We would ask that WAPA reconsider the use of the steel monopoles in favor of the wooden double-circuit H-frame design in the area around the Pinewood Reservoir and Rattlesnake Park. The current visual impacts would be improved as the H-frames have longer spans and would result in fewer structures.	Double circuit wood H-frames do not have longer spans, but rather shorter spans. Steel monopoles combine long term transmission line reliability with the lowest life cycle cost compared to wood structures. Additionally, visual impact may be reduced based on the longer span length for steel monopoles compared to wood H-frames, roughly 25 percent fewer structures per mile (see **Table 2.2-1**).	Craig Driear
Alternative	East	B	Public	Variant 2 is to vary the lines in the vicinity of Rattlesnake Park and Pinewood Reservoir. In Estes Park, these lines are being buried. There is no reason residents in Pinewood Reservoir area should not have the same option. The land along the southern route is open, and the soil would allow for easy burial of these transmission lines.	There has been no decision made to construct the proposed Project underground in the Estes Park area; final decisions on any aspect of the proposed Project will not be made until the Record of Decision is signed. Western has, however, disclosed its preferred course of action in the Final EIS with the identification of the Agency Preferred Alternative, which does not include an underground option. The Alternatives developed for in depth analysis are described in **Section 2.2** of the Final EIS. Only alternatives that were economically or technically infeasible were not assessed.	Craig Driear
Alternative	East	A	Public	In the vicinity of Green Mountain, this alternative has unique challenges when compared to B, C, and D. The terrain is very rugged, the forest dense with few improved roads. Approximately 1½ miles of new right of way will have to be required, an expensive and time-consuming process. There exists the potential for litigation from resistant landowners. A simple solution is to use the existing right of ways. If acquired, the new right of ways will need to be cleared and all of the wood and slash removed. Over such extreme terrain, this is difficult, dangerous, and an expensive proposition. The steep, newly cleared land will be subject to erosion from snowmelt and rain.	Western analyzed Alternative A and found a number of issues with access, steep slopes, and constructability, among others. Alternative A was not selected to be a part of the Agency Preferred Alternative. Alternative B on the east end of the proposed Project has been included as part of the Agency Preferred Alternative.	Craig Driear
Wildlife	All	A	Public	Wildlife, one of the major attractions of the area, will be adversely affected. We all love our wildlife. With the existing significant loss of trees from pine beetles and wildfires, we find it difficult to understand how the destruction of even more forest can be justified, especially when cleared right of ways are already available.	Western analyzed Alternative A and found a number of issues with access, steep slopes, and constructability, among others. Alternative A was not selected to be a part of the Agency Preferred Alternative. Alternative B on the east end of the proposed Project has been included as part of the Agency Preferred Alternative.	Craig Driear
Socioeconomics	All	General	Public	Despite WAPA's conclusions in the Draft EIS Section 4.13.3.2 that most studies have seen -- found no effect on the long-term property values, there will be a severe downward effect on the value of any property newly traversed by transmission lines.	Alternative A was not selected to be a part of the Agency Preferred Alternative. Alternative B on the east end of the proposed Project has been included as part of the Agency Preferred Alternative. Commenter may well be correct that proximity to a transmission line may cause a potential buyer to not purchase a particular property. However, property valuations are based on actual property transactions, and the studies done on transmission lines and property values largely show no or minor negative impacts to property values, and that any impacts tend to diminish over a few years. What the studies indicate is that while some people may object to the presence of a transmission line, there are still enough ready buyers that property values are not greatly affected, and the longer a line is present the more it becomes part of the backgrounds, and the less of a factor it is. Western also notes that these studies look at the impact of a new transmission line on property values, and not an upgrade of an existing line, where valuation considerations would be expected to be embedded in the present value of the property, and the presence of a line has been accepted.	Craig Driear
Socioeconomics	All	General	Public	We are in a process of obtaining a statement of property devaluation. Preliminary estimates show a loss significantly more than their estimates, of at least 50 percent.	Commenter may well be correct that proximity to a transmission line and EMF source may cause a potential buyer to not purchase a particular property. However, property valuations are based on actual property transactions, and the studies done on transmission lines and property values largely show no or minor negative impacts to property values, and that any impacts tend to diminish over a few years. What the studies indicate is that while some people may object to the presence of a transmission line, there are still enough ready buyers that property values are not greatly affected. Furthermore, the longer a line is in place, the less of an impact it makes because its visual impact diminishes as it becomes part of the background. Western also notes that these studies look at the impact of a new transmission line on property values, and not an upgrade of an existing line, where valuation considerations would be expected to be embedded in the present value of the property, and the presence of a line has been accepted.	Craig Driear
Alternative	All	A	Public	Some of the advantages of Alternative A, A-1 and A-2, I just lumped them together. The most acres of new right-of-way acquisition for Alternative A: 153, 157, and 152. Most landowners affected: 46, 48, 42. And, except for the dual right of ways of Alternative D, the most right-of-way erodible acres.	Thank you, your comment has been considered.	Craig Driear
Alternative	East	A	Public	In Table 2.7-1, stated as one of the reasons for dismissing reroutes along U.S. Highway 34 and 36 are that these proposals were not carried forward because they do not address the issues raised during scoping but simply displaced impacts to new landowners, the same argument we feel applies to the Green Mountain area for any variant of Alternative A. For these reasons and the reasons stated above, we feel that Alternative B is preferable.	Western selected Alternative B as part of the Agency Preferred Alternative in this area. See **Section 2.8** of the Final EIS for the rationale for the Agency Preferred Alternative.	Craig Driear

	Section of Route	Alternative	Public or Agency	Comment	Response	Author
Visual	East	General	Public	We can see the wooden H-structures on the ridge line. As we go to a taller pole, if we go to the steel monopoles, it's going to look like a picket fence coming down the hill, and that's, I think -- I would like to see WAPA stay with the wooden structures. I think they're more environmentally friendly, as friendly as a power line can be. The visual impact would be less. Obviously you can't put the whole thing underground, but I do concur that through the open space and all that along Pinewood, that underground is a good alternative.	On the eastern end of the project, Alternative B has been selected as part of the Agency Preferred Alternative. Western also notes that consolidation of the two existing lines on one ROW would result in the removal of the existing line and abandonment of the other ROW, allowing that ROW to revert to natural conditions and lessening the visual impact.	Steve Goodroad
Alternative	All	General	Public	I do believe that using existing right of ways where people do know they bought their property and these power lines were there is the best alternative, although I hope you get rid of the power line on your property, Gary.	Thank you for your comment.	Steve Goodroad
Transportation	All	General	Public	Our concern is that with the construction traffic -- it sounds like there's a lot of heavy trucks and traffic, pulling the poles up and down that hill -- that WAPA address a maintenance agreement similar to the one that we had with the Bureau of Reclamation when they work on the canal project a couple of years ago. That worked very nicely. If we don't get that type of agreement, we ask that it be addressed somehow in the EIS draft.	Western provided a letter dated February 6th, 2012 to the Pole Hill Road Association assuring that its contractor would be required to repair any damage to the private portions as a result of their activity in relation to this project.	Gary Havener
Alternative		General	Public	Secondarily, as a private resident, I do have a pole, and a line does cross in front of our property on the north route. Obviously, I would like to see that decommissioned and am more in favor of the south route. Although we will still be able to see the poles, it will not be on my particular piece of property.	Thank you for your comment.	Gary Havener
Land Use and Recreation	West	General	Public	My only concern is the Pole Hill four-wheel drive route on the northern end. We're losing more and more roads for our recreational use every day. I can see going in and improving the road, but I would like to see it restored back to the original condition that it's in now. That's my only concern on the project.	Western has determined that the 4WD section of West Pole Hill Road would not be improved under the Agency Preferred Alternative. It would be left in its current condition. Alternatives C and C1 propose upgrading the West Pole Hill Road, and the Final EIS Section 4.11 describes the significant recreational impact as a result.	Eddie Householder
Alternative	All	General	Public	One of my concerns from the very first public meetings is, is there really two big pieces to this, the piece up in Estes and the piece at Pinewood? The way -- and we've asked for a breakdown of, you know, what -- like, for example, comparing A but then coming over and using B here, or using A over here and then B over here. You're kind of mixing two pieces together. It's -- people at Estes have their concerns, and we at Pinewood have our concerns. The way this has been laid out makes it very difficult to -- it just makes it difficult to understand the impacts, et cetera. We have people with different preferences. To somehow mix it all together makes it much more confusing.	The Final EIS includes tables in **Section 2.9** that portray the two ends of the ROW as individual alternative options so that impacts to Key Issues on each end can be separately assessed.	Phillip Hunger
Alternative	All	B	Public	My preference is, for the Pinewood area, B; and I want the Estes people to have what they want.	Thank you for your comment.	Phillip Hunger
Visual	East	General	Public	I just would like to emphasize the scenic beauty of the Pinewood area and also the sensitivity of the viewshed. I would support an alternative that takes that into consideration, especially from the north viewshed. In the Draft EIS, I noticed the sensitivity of the southern view towards the lake, but I would like to speak for the community about the viewshed from the north. I think the proposal by Craig Driear is a good one as far as taking that into account, taking those lines that exist out of the neighborhood and try and find a reasonable alternative that works for everybody in the area. I think that idea was a good one, and I would support that as well. I just wanted to emphasize that that's unique in that area as far as the beauty and the view and the experience going up there from the urban corridor. I think we ought to protect that and take that into consideration.	Thank you for your comment.	Craig Canal
Transportation	All	General	Public	We do want to make sure that it's on record that the road -- that will be affected. No matter which route is chosen, that it is considered in the environmental impact and that -- not only for the time that it is being used but for the future so that there can be a planned relook at the road in the future to make sure that that road has, in fact, held up based on what their initial environmental studies indicated.	Short-term and long-term impacts, both beneficial and adverse, from improving West Pole Hill Road under Alternatives C and C1 are described in **Section 4.16.5** in the Final EIS. However, under the Agency Preferred Alternative, Western has committed to leaving West Pole Hill Road unimproved. There could be some improvements made to other access roads, and there could be damage to other roads as a result of heavy truck traffic during construction; any damage would be repaired. Western provided a letter dated Feb. 6th, 2012 to the Pole Hill Road Association assuring that its contractor would be required to repair any damage to the private portions as a result of their activity in relation to this project. Text has been updated to reflect that Western's contractor would be required to repair any damages to the private portions of Pole Hill Road.	Neil OMaley
Transportation	West	General	Public	The only -- the other area I want to talk about today is how we are affected. I want to make sure that it is noted that we are only -- in terms of the roads that I'm talking about here, they're only the areas that are the four-wheel drive roads that are found on the Estes Park side. So anytime I mention Alternative A, it is only for purposes of talking about the western side connected to Estes Park.	Comment is noted.	Neil OMaley

	Section of Route	Alternative	Public or Agency	Comment	Response	Author
Transportation	West	General	Public	So from the standpoint of our business, we have sustained numerous hits and losses due to fires and floods -- or the flood. This is just one more thing that could really impact us severely if the road that is -- let's see here. I believe it is-- 122 -- if 122 is graded down to dirt. One of the things is, even if it was able to be graded down to dirt, there's really no way to bring it back to its original condition. The road itself is made up of granite that is part of the entire mountain. It's not something you can just bring more rocks in later.	Short-term and long-term impacts, both beneficial and adverse, from improving Pole Hill Road under Alternatives C and C1 are described in **Section 4.16.5** in the Final EIS. However, under the Agency Preferred Alternative, Western has determined that no improvements to West Pole Hill Road would be made. Accordingly, there would be no impact on the 4WD section, and no impact to the permittee except possibly some temporary access during actual construction in that vicinity.	Neil OMaley
Land Use and Recreation	West	General	Public	...the more trails that we have reduced, the more pressure that we get on other off-road recreational areas. Case in point: Bunce School Road. When we had Storm Mountain and Pole Hill that were temporarily closed due to the floods, the kinds of pressure that Bunce School Road received turned into just a lot of problems for a lot of people. We had a lot of accidents on that road in Bunce School. There 4 was road degradation. There were -- the overuse of that one particular trail is exactly the same kind of thing that will happen if this road gets turned into just a dirt road because the four-wheel drive experience will no longer be available.	Short-term and long-term impacts, both beneficial and adverse, from improving Pole Hill Road under Alternatives C and C1 are described in **Section 4.16.5** in the Final EIS. However, under the Agency Preferred Alternative, Western has determined that the 4WD section of West Pole Hill Road would not be improved. It would be left in its current condition.	Neil OMaley
Land Use and Recreation	West	General	Public	So I do believe that this is an historic road. This road was established in late 1800s. That was the original road from Loveland up to Estes Park. One of the things we talk about is the whole historic experience that folks had when they came up on covered wagons and the kind of roads that they experienced when they came up here. It is a real eye-opener to so many people.	Thank you for your comment.	Neil OMaley
Alternative	All	B	Public	It's basically right there. That transmission line currently runs right about this far in front of my face looking out a window. I mean, it looks like you can reach out and touch it. I would vote for anything to get it out of my face, but I don't want to get it out of my face at the expense of people who don't have it there now. So I believe that we should be giving consideration to burying across here. That gets it out of my face, which makes me happy. Or if it goes to the H-frames, it's still in a distance and it's not out my front window. A lot of the people that live along that 18E are looking at these lines now. Some of them even have it coming right over the top of them, which I understand it will not happen and, you know, that will go away. But it still could go between 18E and the lake or between Pinewood residences and the lake. So to me, the solution that affects the least amount of people the least extremely is B.	Thank you for your comment.	Larry Pearson
Visual		A	Public	What they end up doing is basically putting a rather large pole on my property that's 8-foot wide, 110-foot tall. And I have a large valley that runs over to where the next pole would be. They would basically be hanging the wires about 300, maybe 350 feet in front of my house, and that would be directly in my view. I bought the property as a view property and built the house thinking it would be a view property. And they're looking at putting a new ROW, not existing but a brand new ROW, and cutting trees and the whole thing through the property. That is, like I say, the front of my house.	Alternative B on the east end of the proposed Project has been included as part of the Agency Preferred Alternative. The existing north line ROW would be abandoned and allowed to return to natural conditions, therefore lessening visual impacts.	Dennis Schump
Electrical		A	Public	I'm also kind of concerned about the EMFs and the fact that the wires run through there. I have several conditions. I have heart monitors that are on the phones. I have cell phone service.	The transmission lines would be designed to minimize EMF and would produce electric fields that are 70 percent less at the edge of the ROW than the existing lines. Additionally, the new double-circuit line would reduce magnetic field levels to less than the existing H-frame line within the 110-foot ROW. A more detailed description of EMF as they relate to potential health effects and the proposed project is found in **Sections 3.14.1.3** and **4.14.5.1**.	Dennis Schump
Alternative	All	A	Public	When we were -- when we had the last meeting, I think in 2012, where we put together the Draft EIS, Alternative A was not presented. I was rather shocked to see it at the last meeting. As a matter of fact, I was more than surprised. I was absolutely blind-sided, I think, by that particular alternative since it hadn't been brought up before.	Members of the public at the routing workshops hosted by Western identified Alternative A as an option they wanted Western to analyze. Western did so, and found a number of issues with access, steep slopes, and constructability, among others. Alternative A was not selected to be a part of the Agency Preferred Alternative. Alternative B on the east end of the proposed Project has been included as part of the Agency Preferred Alternative.	Dennis Schump
Alternative	All	B	Public	I think it's really time to look at what we really have and what we can do for running power lines. To me, it makes no sense of putting power lines where all those people are down there. I mean, yes, the power lines were there first. Now there's people in homes all over. But we have the opportunity to take out those gigantic poles and stuff and move them away and probably over to Alternative B.	Western selected Alternative B as part of the Agency Preferred Alternative in this area. See **Section 2.8** of the Final EIS for the rationale for the Agency Preferred Alternative.	Dennis Schump
Alternative	East	A	Public	I was also a bit disappointed that they didn't consider looking at the Pinewood underground alternative. They were willing to look at the Estes Park underground alternative. Actually, the one over in the Pinewood run is probably about a mile shorter to open up that meadow that they have in there, and it may be a lot cheaper to really put that in underground. But I was disappointed that that wasn't, you know, offered on this side. You know, maybe the political clout was a little greater in Estes than what we have, but I think it would have been fairer to open up that alternative.	The ~~A~~ alternatives developed for in depth analysis are described in **Section 2.2** of the Final EIS. If alternatives were not economically or technically feasible, they were not assessed. Construction of an underground transmission line is quite different from burying a residential distribution line, as described in **Section 2.2.4** of the Final EIS. Large transition structures are also needed when transitioning from above ground to underground and back again.	Dennis Schump

	Section of Route	Alternative	Public or Agency	Comment	Response	Author
Alternative	East	C & D	Public	I really don't think that Alternative C or D is really a viable alternative because it does go through the Newell subdivision. I say clear the poles off of Green Mountain entirely. Get rid of them. I mean, get them away from the people. We have a chance to do that because we're putting new poles in.	Western selected Alternative B as part of the Agency Preferred Alternative in this area. See **Section 2.8** of the Final EIS for the rationale for the Agency Preferred Alternative.	Dennis Schump
Alternative	All	B	Public	So I'm kind of in favor for Alternative B, and I think the worst one out there as far as actually creating damage is putting in a brand-spanking new ROW and trying to -- and destroying the property that's there.	Western selected Alternative B as part of the Agency Preferred Alternative in this area. See **Section 2.8** of the Final EIS for the rationale for the Agency Preferred Alternative.	Dennis Schump
Alternative	East	A	Public	I suppose that's -- another thing, too, is maybe shorter poles could be put over that grassy area that goes through the rattlesnake valley through there. It's kind of described as that because there's no trees. It's just grass. It's perfect for safety and maintenance of those poles. Why would you want to go through a canyon and up steep hillsides? And it's very rugged and rocky. It just does not make sense.	Western selected Alternative B as part of the Agency Preferred Alternative in this area. See **Section 2.8** of the Final EIS for the rationale for the Agency Preferred Alternative. While shorter structures are advantageous in certain circumstances, in open areas taller structures are usually less intrusive because fewer structures per mile are needed.	Dennis Schump
All	All	General	Public	I do have an alternative. I'm not sure how to tell you about it. I have a picture of it. I'm saying go to a different pole, and I've indicated what pole it is, basically across from this other pole. I mentioned north and south and east and west.	Different structure types are evaluated in **Section 2.2.2** of the Final EIS. Landowners have an opportunity to adjust the location of structures on their properties to better suit their needs (within certain engineering constraints). It is Western's goal to have the least possible effect to individual landowners, subdivisions as a whole, and businesses.	Dennis Schump
Visual	East	A	Public	My property, they want to go north for a while and around. What it would end up looking like is gigantic antenna across going every -- you know, 800 feet across the top of Green Mountain. That would be this whole area. And you can see this all from Loveland. You would see all those poles. Aesthetically, it's very unattractive to see something like that. All those poles up there in that Alternative A you would see from the lake and would be way at the top of the hill. It would look very bad.	Western selected Alternative B as part of the Agency Preferred Alternative in this area. See **Section 2.8** of the Final EIS for the rationale for the Agency Preferred Alternative.	Dennis Schump
Transportation		General	Public	We're sure that a large part of that breakdown, ["significant breakdown of the road"] which is increasing our cost on the road, to maintain the road, is because of the heavy truck traffic that damaged the substructure underneath the paving that we've done. We're concerned that the WAPA project will have a similar impact. The heavy steel structures and the large truck traffic that's going to come up and down that road in order to do this, regardless of which alternative is chosen, will continue to deteriorate our roads. I went through the impact study, the environmental draft, section by section looking for consideration of the damage to the road, and it was not there. So we would like to see that that was considered in the environmental impact. It is a clear impact to the environment.	Western would reconstruct or recondition roads only to the extent that it is necessary to provide access for construction equipment. Western would also consider overland access where topography, soil, and vegetation conditions support overland travel with minimum disturbance and compaction. As stated in **Section 2.3.4**, damaged roads would be restored to their original condition.	Neil Snyder
Transportation	All	General	Public	As far as Big Thompson 4-Wheelers, I share a similar concern to Eddie Householder on the road on Option C at the eastern -- or western end of the project. The environmental statement says that they plan on grading that four-wheel drive road out so it is suitable for semi-trailer truck traffic carrying steel poles. It also says in the environmental impact statement that that is one of the few remaining quality four-wheel drive roads in the area of Estes Park.	Short-term and long-term impacts, both beneficial and adverse, from improving Pole Hill Road under Alternatives C and C1 are described in **Section 4.16.5** in the Final EIS. However, under the Agency Preferred Alternative, Western has determined that it would not upgrade the 4WD section of Pole Hill Road under any alternative, leaving the road in its current condition.	Neil Snyder
Land Use and Recreation		General	Public	The proposed C-1 in the environmental statement is to grade that road out, suitable for semi-trailer truck traffic, and not restore it to its original condition afterwards, which would totally ruin that road for any kind of four-wheel drive. In addition, it also addressed an impact in increased public use to the area afterwards because of increased public access for people with passenger cars. We would like to see that option not taken and keep that one of the few remaining four-wheel drive roads accessible.	Short-term and long-term impacts, both beneficial and adverse, from improving Pole Hill Road under Alternatives C and C1 are described in **Section 4.16.5** in the Final EIS. However, under the Agency Preferred Alternative, due to Forest Service concerns about improvements to the 4WD section of West Pole Hill Road, Western has determined that no improvements to the 4WD section of road would be made. Since there would be no change to the road or its Forest Service classification, there would be no indirect change in access to the forest or recreation resulting from the APA.	Neil Snyder
Alternative	East	General	Public	So anyway, what I'm thinking is that it should be buried underground across 18E. That way, as it's indicated, Newell Lake View subdivision is exactly what it is: Newell Lake view. And it wouldn't be in anybody's view or, as Larry was saying, out his window. So that's what I would like to say.	The rationale for the selection of the Agency Preferred Alternative is presented in **Section 2.8** of the Final EIS. Underground options were not selected for the reasons provided there.	Patricia Storm
Alternative		A	Public	I just want to put in front of you -- so I'm just really perplexed as to how they came up with that front end of Alternative A. I'm just really perplexed because I would love to take some WAPA engineers and walk that. It is very rugged. It's super difficult to get around. I can't think for the life of me why they would think that that would be actually a viable option to construct and maintain when they have something that they have already in existence, the existing easement.	Members of the public at the routing workshops hosted by Western identified Alternative A as an option they wanted Western to analyze. Western did so, and found a number of issues with access, steep slopes, and constructability, among others. Alternative A was not selected to be a part of the Agency Preferred Alternative. Alternative B on the east end of the proposed Project has been included as part of the Agency Preferred Alternative.	Lucinda Van Inwagen
Alternative		A	Public	I would welcome to give them a tour and walk that line because it is extremely rugged. And, you know, I actually hear what you're saying about the trails and things like that. I think those things should be considered: our heritage, our legacies, our history.	Members of the public at the routing workshops hosted by Western identified Alternative A as an option they wanted Western to analyze. Western did so, and found a number of issues with access, steep slopes, and constructability, among others. Alternative A was not selected to be a part of the Agency Preferred Alternative. Alternative B on the east end of the proposed Project has been included as part of the Agency Preferred Alternative.	Lucinda Van Inwagen

	Section of Route	Alternative	Public or Agency	Comment	Response	Author
Land Use and Recreation	West	A	Public	My concern with this is if they do come -- instead of using Alternate A up at Pole Hill on the western part there, if they come up through the main area like Neil was talking about, called 122, the four-wheel drive road, if they end up plowing that, the negative thing on that is -- like, some of the people at22 the club have been talking. It's going to cause a lot more damage and overcrowding on other trails around, not to mention it will make a massive impact on the business, a reputable business, that's been up in Estes Park for several decades now, a company that employs several different guides and drivers. We do emphasize a lot on the environment and the historical aspects of the Pole Hill Trailhead. So I guess I would just -- I would be opposed to that.	Short-term and long-term impacts, both beneficial and adverse, from improving Pole Hill Road under Alternatives C and C1 are described in **Section 4.16.5** in the Final EIS. However, under the Agency Preferred Alternative, Western has determined that the 4WD section of West Pole Hill Road would not be improved. It would be left in its current condition.	Craig Welker
Land Use and Recreation	West	A	Public	I would be more in favor of Alternate A on that western side right there. I don't know how hard it would be or if anybody would think about it, but right here where that little loop comes up, I don't know if there's some way of joining that right there and then coming over and then leaving this whole section right here alone; and then right in that little area right there that kind of goes out, that's the area called the Notch which has a beautiful overlook of the whole Estes Valley. We take a lot of our customers and stuff over there quite a bit. By doing that, if they used Alternate A up in that area, it will make minimal impact on that first section of the trail.	Western is very much aware of the value residents place on the visual aspects of their environment. Alternative C, the Agency Preferred Alternative, has been selected for the western portion of the project area. **Section 2.8** of the Final EIS describes the rationale behind the selection of the Agency Preferred Alternative. The abandonment of one entire existing ROW is a feature of all alternatives except Alternative D and No Action, and would result in a substantial improvement to visual resources that would more than offset the incremental impact of taller structures on the other ROW. The replacement of an existing line with a new one should not have a substantial effect on a given property, and landowners have an opportunity to adjust the location of structures on their properties to better suit their needs (within certain engineering constraints). It is Western's goal to have the least possible effect to individual landowners, subdivisions as a whole, and businesses.	Craig Welker
Alternative		A	Public	So I guess my choice would be to completely avoid that first section of that trail and stick on the western part there with Alternate A.	Members of the public at the routing workshops hosted by Western identified Alternative A as an option they wanted Western to analyze. Western did so, and found a number of issues with access, steep slopes, and constructability, among others. Alternative A was not selected to be a part of the Agency Preferred Alternative. Alternative B on the east end of the proposed Project has been included as part of the Agency Preferred Alternative.	Craig Welker
General	West	General	Public	So there's a significant amount of infrastructure that we've had for decades supporting the infrastructure around Estes Park and the related communities.	Comment noted.	Bill Curren
General		General	Public	My second comment that I wanted to touch on were the routes that were outlined in detail and many of the variations around it. I think what's important, as I've already alluded to, is we have lots of infrastructure today, and we're going to have lots of infrastructure going forward on our property. We're a willing participant in that infrastructure that's, unfortunately, a necessary evil for all of us. None of 19 us wants it in our backyard, but we recognize the need for it. I think what's important, though, and leading into my last point, you know, is we are certainly encouraging WAPA to consider the route that meets all of their goals which are highlighted in the back, but certainly one that's fair.	Thank you for your comment.	Bill Curren
Alternative	All	General	Public	You've highlighted the safety, accessibility, cost. I think the fourth one was around fire resistance. All of those are critically important parts of it, but all of those goals, we believe, need to be met with mutually shared burden amongst all of us as members of this community, and I encourage that to be one of the driving considerations. Variant A-1, for example, does not meet that goal and really shifts the entire burden of these two power lines, along with all the other infrastructure that we have, onto one property owner. That would be one of the ones that we're not in support of.	Thank you for your comment.	Bill Curren
Visual	West	General	Public	My key remark that I would like to make has to do with the view, as the previous gentleman said. I like to use the word what we have here is a national treasure, and we ought to treat it as a treasure, as you would anything in your possession, a family heirloom or any other thing that you can think of that's a treasure. It's a national treasure. In fact, it's an international treasure. We have visitors from throughout the world who come here.	Thank you for your comment.	Cullen Darnell
Visual		General	Public	Now as a people, I think what we're faced with is, where are we going to go as far as visual? How important is it to us? ...Well, if you look at the particular area that concerns me most is that the operational issues are the primary concerns of WAPA. That's what their mission statement is. That's what they're rated on. So they're doing the job that they should. But the visual impact is the thing that we're going to leave as a legacy for our future generations. And the people during the 1930s didn't have that opportunity because transmission line limitation in terms of doing buried lines so that you protect the vision, the visual effects. They didn't have that available to them. It's only in the '50s and '60s that that particular technology started evolving rapidly.	Western is very much aware of the value residents place on the visual aspects of their environment. **Section 2.8** of the Final EIS describes the rationale behind the selection of the Agency Preferred Alternative. The abandonment of one entire existing ROW is a feature of all alternatives except Alternative D and No Action, and would result in a substantial improvement to visual resources that would more than offset the incremental impact of taller structures on the other ROW. An underground option was not selected for the reasons discussed in that section.	Cullen Darnell
Visual		General	Public	So as you look at this, one of the limitations that I'm concerned about is that it's going to be costly to do buried lines that would protect the visual. ...Well, is there some way that we can try to move ourselves into a progressive stage where we can actually try to find the money to go ahead and preserve what is a national treasure?	While cost is an important consideration when considering underground construction, it is not the only one. Please see **Section 2.2.4** for further information on the other issues associated with underground construction, and **Section 2.8** for the rationale for selecting the Agency Preferred Alternative.	Cullen Darnell

	Section of Route	Alternative	Public or Agency	Comment	Response	Author
Proposed Project, Visual	West	General	Public	You know, I don't believe that the quantification of that particular category, the visual resources, that I would agree with some of the adjectives used here, like minor to moderate and so forth. This is going to be the start of something in a new decade that the '30s and the '50s had initiated. Is there some way that we can go beyond that and try to get the funds some way that we can protect the national treasure?	Impacts to visual resources are highly subjective and vary widely depending on the individual. Several methods have been developed to assess visual change or impacts that attempt to standardize impact ratings and terminology, and minimize bias in impact assessments. Tables in **Section 2.9** of the Final EIS portray a quantitative presentation of visual impacts. Partial public funding is complicated by regulations governing Western's acceptance of funds from the public; legislation would likely be required to do this. Lacking public or appropriated funding from Congress, electrical power rates (either Western's wholesale power rates or participating utilities retail consumer rates) would pay for the proposed Project in any event.	Cullen Darnell
Socioeconomics		A,B	Public	The other part that I think I would review and see if there's some way of making more accurate judgment in one of these cells, is that would be the socioeconomics part, and it's specific under Alternate A and B, which is essentially the same. I feel the same about A and B. I have a personal interest in B. I'm only two lots away from the line in B. But Alternates A and B, it affects people living there in both places, and I would like to see, is there some way that those people can be -- their concerns addressed. But here's the thing -- a minor decrease in property values as a result of taller structures and, conversely, minor increases in property values where the structures would be removed, I personally don't agree with that. I think that it's pretty significant decreases and increases in value. Very significant.	As detailed in **Section 4.13**, most peer-reviewed studies in the literature found no effect to property values when adjacent to electrical transmission lines, which was attributed to the addition of open space contributed by the transmission line easement. Additionally, in the case of this project, many of the residences have property values that have taken into account the presence of the transmission lines because they have been built near or against the easements of the existing transmission lines. Furthermore, as detailed in **Section 2.2.2**, shorter average height structures with a shorter span length would be considered in sensitive communities. Shorter structures do have a trade-off, however. With shorter structures the spans have to be reduced to maintain center-span clearances, and with shorter spans more structures are needed over a given length of line.	Cullen Darnell
Electrical		General	Public	One of the issues is the fact of looking at, is there any health issues on this. Obviously, it's -- there's been all sorts of studies done. There hasn't ever been any definite linkages to that, but the one that's kind of a weak cause and effect that's been established is some different types of cancer with children that are close to the facilities. ...There's been a lot of progress made, but we have never -- as a society, as a human race, we have not been able to demonstrate that there is no connection. We haven't been able to prove there is a connection. ...There's a lot of work, but there's no substantial data that's proven definitely that there's no linkage, nor is there any definite linkage other than the child cancer thing.	The transmission lines would be designed to minimize EMF and would produce electric fields that are 70 percent less at the edge of the ROW than the existing lines. Additionally, the new double-circuit line would reduce magnetic field levels to less than the existing H-frame line within the 110-foot ROW. A more detailed description of EMF found in **Sections 3.14.1.3** and **4.14.5.1**.	Cullen Darnell
Socioeconomics		General	Public	Whenever you couple that with the other concern I had about the socioeconomic issue, I think what you see is that people that are adjacent to the right of ways are going to be the ones that are probably going to be impacted most by this economically.	As detailed in **Section 4.13**, most peer-reviewed studies in the literature found no effect to property values when adjacent to electrical transmission lines, which was attributed to the addition of open space contributed by the transmission line easement. Additionally, in the case of this project, many of the residences have property values that have taken into account the presence of the transmission lines because they have been built near or against the easements of the existing transmission lines.	Cullen Darnell
General		General	Public	And the only real suggestion I had as far as the study -- thought it was excellent, too -- but it perhaps did not give enough weight to people. That kind of seems like that's a tree falling in the forest. Does it make noise? It doesn't really matter if there's no people around.	Thank you for your comment.	Gordon Pedersen
Alternative	West	General	Public	There are half a dozen homes right up here at the top where it goes over the top of Pole Hill. We're concerned with that.	Western is aware of the location of these homes, and they are one of several considerations Western needed to balance to determine its Agency Preferred Alternative.	Gordon Pedersen
Alternative	All	A1,C2	Public	The other thing is, I think we're mainly in favor of the -- well, we like Variant A-2 and C-1, underground, obviously.	Please see **Section 2.8** of the Final EIS for a discussion of the rationale for the selection of the Agency Preferred Alternative. For the reasons given there, an underground option was not selected for the Agency Preferred Alternative. Because of the need to maintain a shrub-free 50-foot-wide zone over buried lines, an underground line may not be less visible than an overhead line, and the cleared ROW would likely have more visual influence than would the presence of structures at a distance. Please see **Appendix C** in the Final EIS for comparisons of visual simulations.	Gordon Pedersen
General	West	General	Public	The other thing I would say right now, and a big concern of the town as well, is the power lines that run across Lake Estes. We recognize that's not part of this study, but we think there's going to be a strong urging to underground those power lines from the town and the 6,000 people that are affected, as well as a couple million tourists.	The lattice steel line across the lake is not within the scope of this Project. The purpose and need for the proposed Project is the aging existing wood pole lines. Western is aware of the desire to underground the existing section of lattice steel line that crosses the lake, and believes that undergrounding of this segment would be seriously considered when the time comes to rebuild that section of line.	Gordon Pedersen
Visual	West	General	Public	The first of those point is economic impact. All but two of the routes would include clearcuts that go along U.S. 36. ...Everybody that lives here moved here for the views. Everybody that has a business here makes their money off of the views. The views are very important to us. U.S. 36 is the gateway to those views. If you do 300-foot clearcuts along U.S. 36, that will have an impact on us. It will have an impact on our lives in the sense we don't really appreciate it as much.	Western is very much aware of the value residents place on the visual aspects of their environment. Alternative C, the Agency Preferred Alternative, has been selected for the western portion of the project area. New ROW would be required near U.S. Highway 36, which is intended to reduce visibility from the highway. **Section 2.8** of the Final EIS describes the rationale behind the selection of the Agency Preferred Alternative. The abandonment of one entire existing ROW is a feature of all alternatives except Alternative D and No Action, and would result in a substantial improvement to visual resources that would more than offset the incremental impact of taller structures on the other ROW.	Larry Lawson

	Section of Route	Alternative	Public or Agency	Comment	Response	Author
Socioeconomics	West	General	Public	Point Two is community standard. Estes Park imposes on itself a standard of burying its power lines because that improves the view. Somebody said, "Well, should people have to pay for that?" ...Everybody that builds a house here pays to have their power lines buried. Okay. So paying to -- people having to pay to have their power lines buried is not new. It's this thing that's new. ...Somebody said, "Well, gee, should taxpayers have to pay for that?" But it's my understanding that WAPA is not a tax -- primarily a taxpayer-supported entity. Maybe someone can clear me up on that. It's an enterprise entity of the federal government, not a taxpayer-supported entity. So when we say people shouldn't have to pay, you're saying the customers shouldn't have to pay the full price of their product. I don't think that we hold to that standard in other places, and I don't think we should be held to that standard here. ...Anyway, I think that paying for burying power lines is not new, and that's going to be paid for by the customers, by the users of that power.	There are major differences between burying a power distribution line to residences and constructing an underground high-voltage transmission line. Simple trenching and direct burial of residential service distribution lines is routine, easily accomplished, and inexpensive so long as no rock is encountered. See **Section 2.2.4** of the Final EIS for a description of how an underground transmission line would need to be constructed. Western is not taxpayer supported, but funds itself through its power rates and customer financing. If an underground option would have been selected, the additional cost would have to be recovered through an increase in wholesale power rates Western charges its customers, and they would in turn pass the cost on to retail power consumers.	Larry Lawson
Socioeconomics	West	General	Public	Okay. The next thing then is economic justice. Should the people of Estes Park pay more by having power towers in their yards as well as having to pay for the electricity, or should the cost of that electricity be spread over all of the customers? There's some debate over how much it costs to bury power lines. It costs a lot, okay? But then if you say if you spread that over 20 or 30 years and you spread that over -- well, WAPA covers from the Canadian border to Mexico, but undoubtedly these power lines don't help all those people. Probably they help Weld County and probably they help Larimer County and probably they help Boulder County. If you spread the cost over those people and over a number of years, it might be 50 cents a month, or it might be a dollar a month, but it's not an overwhelming burden. It's not -- the argument of economic justice says we should all bear that cost. We should pay more for our electricity, and other people should too, but we should not pay more. We should not pay by paying for the electricity and paying for it by having a pole in our front yard.	Western has a number of different power rates that are defined largely by power project; power projects are the generation components of the Federal hydroelectric dams and water storage/delivery projects authorized by Congress. Power rates are determined by calculating the repayment costs, operations and maintenance costs, replacement costs, interest payments, and all other costs of the specific project, according to the authorizing legislation. So, while the cost of the Estes-Flatiron Project would be included in the power rate Western charges its customers, the rate increase would only affect Loveland Area Projects customers. As for the location of the line, Western has endeavored to remain on existing ROW to the extent possible to minimize property impacts, departing from existing ROW only where other resource concerns prevail.	Larry Lawson
Alternative	All	General	Public	One of the points that was made yesterday that I thought was really good was that this really needs to be broken down into two separate conversations between what happens on the east and what happens in the west and how it is defined with the A's and A-1's or the Bs. It needs to be -- it needs to be more clear. The people that are affected most on one side or another should kind of have a little more weight on what is said on that particular part of it.	The Final EIS includes tables in **Section 2.9** that portray the two ends of the ROW as individual alternative options so that impacts to Key Issues on each end can be separately assessed.	Neil OMaley
Transportation	West	General	Public	We provide a service in bringing people up there, which is a four-wheel drive experience. One of the options is to grade Pole Hill, the four-wheel drive road, down to dirt so tractor trailers can go up there. There are no provisions in there to bring it back to its original state, not that I believe it could be after it was done. But it will take away the entire -- it will take away our business, not only our business, but we provide many jobs here in the Estes area, both seasonal and full time, to support this. So one of the things -- so not only will this -- if this direction is taken, that the road will be brought down to dirt, but there will be numerous homes along that corridor -- Ravenscrest and all those folks up on Pole Hill that currently don't see the power lines or they see them in a very minimal aspect, they will be greatly affected by this.	Short-term and long-term impacts, both beneficial and adverse, from improving Pole Hill Road under Alternatives C and C1 are described in **Section 4.16.5** in the Final EIS. However, under the Agency Preferred Alternative, Western has determined that no improvements to West Pole Hill Road would be made. Accordingly, there would be no impact on the 4WD section, and no impact to the permittee except possibly some temporary access during actual construction in that vicinity.	Neil OMaley
Alternative		General	Public	The thing that I find fascinating is that a lot of this work that we're told is being done is -- we don't have to change exactly what we have. We can replace a lot of the power lines and continue on with the normal path that we have. Nobody is -- I don't know if many people are actually talking about that. For some areas, I think that might be the best option, because they are fairly low impacts in terms of visual.	Alternative D was considered as an option; that alternative would replace both lines in kind. For the reasons discussed in **Section 2.8** of the Final EIS, that option was not selected. Although somewhat taller structures would be used in the double-circuit alternatives, one of the two existing ROWs would have the existing transmission line removed. That ROW would be abandoned and allowed to revert to natural vegetation, a substantial improvement over current visual conditions.	Neil OMaley
Visual	West	General	Public	You know, we -- numerous people have said the views, the views, the views. You're absolutely right. One of my good friends, who I would like to quote, he said, "Do you know the reason why people come to Estes Park?" He said, "It's because people live in ugly places." And that is so true. So we have three or four million people a year come up to just -- and these are just the numbers that recorded by the national park. So there's probably even more people that are coming into, you know, Estes that are not even going into the park. Everything that we can do to preserve this national treasure -- like has been mentioned before, it's not just the national park. It's all of this land that we're in. Anything we can do to bury lines, to protect the views, and look at a very long range is extremely important. I don't know how to overemphasize this. Wherever there's a visual impact that we can reduce it and make values of people's properties better, we need to strive mightily to do so. Because unlike those other people that come from ugly places, a power line in their backyard or that's in the distant view or in a view that they can see may not be that bad. That might be the only thing they get to see besides a bunch of homes. But that's not the way it is for us up here.	Western is very much aware of the value residents place on the visual aspects of their environment. The abandonment of one entire existing ROW is a feature of all alternatives except Alternative D and No Action, and would result in a substantial improvement to visual resources that would more than offset the incremental impact of taller structures on the other ROW. **Section 2.8** of the Final EIS addresses the rationale for Western's selection of its Agency Preferred Alternative. An underground option was not selected for the reasons discussed in that section.	Neil OMaley

	Section of Route	Alternative	Public or Agency	Comment	Response	Author
Transportation	West	General	Public	We do not want this road to be turned to dust. And something that's very interesting, too, is that the United States Forest Service does not want that to happen either. They have very specific and exact, precise language that states they do not want the rugged nature of Pole Hill Road to be changed at all for a very big piece of it.	Short-term and long-term impacts, both beneficial and adverse, from improving Pole Hill Road under Alternatives C and C1 are described in **Section 4.16.5** in the Final EIS. However, due to Forest Service concerns about improvements to the 4WD section of West Pole Hill Road, Western has determined that no improvements to this section of road would be made as part of the APA.	Neil OMaley
Transportation	All	General	Public	So I just want to sum up that we work with the United States Forest Service. We work with Big Thompson 4-Wheelers, and we in agreement with the national forest service and the recommendation to leave the natural trail just the way it is. It is an historic route that was established from Loveland to Estes Park. It was first used by Native Americans, and then it was used by the settlers. We have actual historical indicators that wagons, Conestoga-style wagons, have been down there and used that trail extensively; hence the name -- the reason for the name, why it's called Pole Hill, is because of what they had to do in order to get their wagons safely down that road.	Short-term and long-term impacts, both beneficial and adverse, from improving Pole Hill Road under Alternatives C and C1 are described in **Section 4.16.5** in the Final EIS. However, under the Agency Preferred Alternative (APA), Western has determined that it would not upgrade the 4WD section of Pole Hill Road.	Neil OMaley
General	West	General	Public	I would say that two themes are very, very familiar from all of those conversations that I've had: Not in my backyard, and; We have to protect the views. We understand that the not-in-my-backyard argument is not going to hold water with WAPA, okay? And that's understandable. That's certainly something that, if I were in their shoes, I'd have to discount that as well. It's not a vote. It's not a popular vote. It's what's best for the Estes Valley and what's best for the customers of WAPA.	The commenter identifies two of the wide range of issues and concerns Western must consider a in order to arrive at a decision for the proposed Project. The NEPA process is designed to solicit input on any and all factors important to the public. In addition, Western must consider natural resources, economics, laws, regulations, access, operations and maintenance, and a host of other factors in its decision making. The rationale for the selection of the agency Preferred Alternative is provided in **Section 2.8** of the Final EIS.	Larry Pearson
Visual	West	General	Public	So we come to the views ...You came up one of the most scenic, beautiful drives anywhere in the world. ...But that view then becomes scarred by power lines that were built 60, 80 years ago. But we have a great opportunity to reclaim that scenic beauty of the Estes Valley. I think we know that the Town of Estes Park has a guideline that any new power line should be buried. That's because they're working to reclaim the scenic view and the scenic beauty of the Estes Valley. ...if money is the issue, we need to look for opportunities for public-private partnerships to try to bury the lines. So Variant A-2, we believe, is the best option to reclaim the lines -- or reclaim that scenic beauty -- correction on that -- reclaim that scenic beauty and also affect the least number of property owners. We understand that it has higher costs, but we need to figure out a way to do it.	Western is very much aware of the value residents place on the visual aspects of their environment. **Section 2.8** of the Final EIS describes the rationale behind the selection of the Agency Preferred Alternative. The abandonment of one entire existing ROW is a feature of all alternatives except Alternative D and No Action, and would result in a substantial improvement to visual resources that would more than offset the incremental impact of taller structures on the other ROW. Undergrounding a high-voltage transmission line is far different than the direct burial of a residential distribution line. A description of constructing a buried transmission line is provided in **Section 2.2.4** of the Final EIS. **Section 2.8** of the Final EIS addresses the rationale for Western's selection of its Agency Preferred Alternative. An underground option was not selected for the reasons discussed in that section.	Larry Pearson
Visual	West	General	Public	And one of the things I think is really important is to -- if you're going to go backwards, if you decide to put the poles in and just kind of keep on the same route, you need to -- if you put in higher poles -- and even the poles that are there, they do affect the property values extensively. And it is not minor. It's a lot. And the fellow that talked about power poles in cities where you see the same kind of structures and people don't notice them, that's probably true. But up in Meadowdale Hills, it's a real factor. By replacing those existing poles into taller poles and then just keeping on with the same old, same old, let's not do that. Let's protect what we have. Views are important. Absolutely. But everything is important. Let's move forward, burying the lines, doing whatever needs to be done. If it takes longer, fine. And then asking for help from the community of Estes Park, too, because I think WAPA would be surprised as to the feeling, the general feeling, about this as far as getting the lines buried. But also coming down 36. That just -- and up in Meadowdale Hills. Let's do it right while we have the chance.	There have been several alternative routes studied in the EIS, all involve some sort of resource trade-offs, and most, including the Agency Preferred Alternative, include the removal of one of the two existing lines and abandonment of the ROW. This would result in an improvement to the existing visual setting that would more than offset the incremental impact of taller structures on the other ROW. Western's rationale for the selection of the Agency Preferred Alternative is presented in **Section 2.8** of the Final EIS. Commenter may well be correct that proximity to a transmission line and EMF source may cause a potential buyer to not purchase a particular property. However, as detailed in **Section 4.13**, property valuations are based on actual property transactions, and the studies done on transmission lines and property values largely show no or minor negative impacts to property values, and that any impacts tend to diminish over a few years. What the studies indicate is that while some people may object to the presence of a transmission line, there are still enough ready buyers that property values are not greatly affected, and the longer a line is present the more it becomes part of the background, and the less of a factor it is. Western also notes that these studies look at the impact of a new transmission line on property values, and not an upgrade of an existing line, where valuation considerations would be expected to be embedded in the present value of the property, and the presence of a line has been accepted. In the case of this project, many of the residences have property values that have already taken into account the existing transmission lines and easements.	Connie Phipps
Visual	West	General	Public	The views are why we live here. When I come home from traveling the world, which I seem to be doing more and more often these days, everything is pretty good view-wise coming up here. You get to the top of Pole Hill, and it's still pretty good, pretty good, pretty good coming down Pole Hill. But then somewhere around in here, this area here -- and I can't see where Highway 36 actually intersects the lines -- things get pretty bad. Being a rock climber, one of the first things I look at, other than the view when I come over the hill and say, "Okay. I'm home. This is great," one of the thirst things I look at is Lumpy Ridge because I spend a lot of time on those rocks over there. To have those big 115 kilovolt lines obstructing that view is entirely offensive to me. Then I come down here and, of course, the great evil of all times put in in the late '40s, the huge structures going across the lake.	Western is very much aware of the value residents place on the visual aspects of their environment. Alternative C, the Agency Preferred Alternative, has been selected for the western portion of the project area. New ROW would be required near U.S. Highway 36, which is intended to reduce visibility from the highway. **Section 2.8** of the Final EIS describes the rationale behind the selection of the Agency Preferred Alternative. The abandonment of one entire existing ROW is a feature of all alternatives except Alternative D and No Action, and would result in a substantial improvement to visual resources that would more than offset the incremental impact of taller structures on the other ROW. An underground option was not selected for the reasons discussed in that section. Western knows that the removal of the lattice steel structures along the causeway would greatly improve the visual situation coming into Estes Park, but that segment is not included in the proposed Project, and is beyond the scope of this EIS.	Chris Reveley

	Section of Route	Alternative	Public or Agency	Comment	Response	Author
Visual	West	General	Public	One thing we can agree on is that we don't want to make our town uglier. In fact, we might even all be able to agree on the idea that we want to make our town more attractive. That's a win, win, win for every individual and every faction in this town.	Thank you for your comment.	Chris Reveley
Alternative	All	General	Public	So I would be in favor of making these lines disappear. I looked into undergrounding. It's expensive, but very, very feasible with 115 kilovolt lines. In fact, they underground 230 kilovolt lines in other parts of the world. It's done all the time these days.	Please see **Section 2.8** of the Final EIS for a discussion of the rationale for the selection of the Agency Preferred Alternative. For the reasons given there, an underground option was not selected for the Agency Preferred Alternative. Please see **Appendix C** in the Final EIS for comparisons of visual simulations.	Chris Reveley
General	West	General	Public	The other thing everybody in town would agree on, I believe, is that hydroelectric power is a good source of energy. So really if you back off several frames, the two alternatives are to rip down all the infrastructure and quit generating power in Estes Park or try and make this better for everybody. Well, I don't think anybody wants to tear it all down. So let's do everything we can to make this more attractive to the people who live here, the visitors, and all the people in the future who are going to be coming here from all over the world. If it costs 25 million bucks to do that, that's a bargain.	Western has endeavored to balance the many factors it needs to consider in its decision making. Please see **Section 2.8** of the Final EIS for a discussion of the rationale behind the Agency Preferred Alternative.	Chris Reveley
Electrical		General	Public	I have an easement, and so we have power lines going over our property. So we're mainly concerned about the health effects. We just don't know. And we're going to have a lot more power going within -- you know, pretty close to our house. So that's our main concern. I agree with everything everyone else said, but that's our main thing. It just seems like if you can avoid putting those huge power lines through a crowded neighborhood, we should do it. That's all.	The transmission lines would be designed to minimize EMF and would produce electric fields that are 70 percent less at the edge of the ROW than the existing lines. Additionally, the new double-circuit line would reduce magnetic field levels to less than the existing H-frame line within the 110-foot ROW. A more detailed description of EMF found in **Sections 3.14.1.3** and **4.14.5.1**.	Mary Elizabeth Smith
Proposed Project		General	Public	...we want Western Power to think beyond this project. I want them to think how this actually might be a hundred-year project. We're planning for now, and undergrounding in this phase will facilitate what comes next. That is possibly widening the causeway, setting the conduits to get rid of the lattice work that's there now. Essentially, that's what I wanted to say. I think it's let's get our planning horizon beyond this ten-year project, or however long it's going to take, and get to the future and make it as easy for those coming after us to tie into that system and just complete the project as an underground project.	**Section 2.8** of the Final EIS describes the methods and considerations for choosing the Preferred Alternative. For the reasons discussed there, no underground options were included in the Agency Preferred Alternative for this project. Western agrees that when the time comes to replace the lattice steel structures along the causeway, underground construction would likely be the preferred course of action. At that time the location of the transition structures would need to be determined, and the extent of the underground segment defined.	Chip Sproule
Visual	West	General	Public	Just really briefly, when I first came to Colorado and came up to Estes Park, I was stunned by the power poles. I thought it was so ugly coming into Estes that it was hard to notice the gorgeous valley. So our family decided to buy a cabin over in Grand Lake. We've been going to Grand Lake for about 25 years. We took our family dollars, vacation dollars, to Grand Lake.Here we are in Estes, finally after 25 years paying attention to what this incredible community has to offer after years of Grand Lake. But we didn't see it because I was so blinded by those ugly, ugly, power poles.	Western is well aware that the removal of the lattice steel structures along the causeway would greatly improve the visual situation coming into Estes Park, but that segment is not included in the proposed Project, and is beyond the scope of this EIS.	Carol Thomas
Alternative	East	A	Public	I have lived in the Pinewood area for 17 years and purchased my 20 acre parcel in 2010 to build my dream home. Now the proposed new lines will cross directly over my new building site. I plan to go forward with the building of structures, so please be advised that the home and all the outbuildings will be in place within this next year. I would also like to note that my property is very unique and remote. It is only accessed by a very narrow steep mountain road which is on the north slope and stays icy all winter long, which makes large truck travel out of the question. As proposed now, the huge granite outcroppings would have to be blasted out for large truck access to be feasible. We understand the need to upgrade the power transmission lines, but we do not understand why, with all of the existing easements and power lines in place now, we need an additional new scar to our landscape. The environmental, economic and logistical feasibility of Alternative A with all of the existing alternatives makes no sense at all.	Members of the public at the routing workshops hosted by Western identified Alternative A as an option they wanted Western to analyze. Western did so, and found a number of issues with access, steep slopes, and constructability, among others. Alternative A was not selected to be a part of the Agency Preferred Alternative. Alternative B on the east end of the proposed Project has been included as part of the Agency Preferred Alternative.	George L. Archey, Jr.

	Section of Route	Alternative	Public or Agency	Comment	Response	Author
General		General	Public	Duplicate, see comment letter 74 ALTERNATIVE A As outlined in the Pinewood community group statement (titled "WAPA Rebuild Project--Group Statement.pdf"), Alternative A would require the acquisition of new rights-of-way (RoWs) and the development of access roads through steep, heavily forested terrain on the north side of Green Mountain. The resulting loss of trees would not only irreparably destroy the visual beauty of the area, but would also likely lead to severe erosion. Wildlife would be displaced – not only mammals, but also (according to my next-door neighbors, who are dedicated birdwatchers) more than 50 species of birds. Like many of my neighbors, I bought a home in the Pinewood community because I wanted to enjoy the peace and beauty of the mountain and its wild creatures. Although my house is on the south side, I walk almost every day (both for pleasure and for health reasons) to the top of Green Mountain and along the north side. If Alternative A is chosen, the peace and beauty would be gone forever. Walking would become a distressing chore rather than a pleasure, and this would surely have an adverse effect on my health. A third issue is that of cell phone reception. Currently, we have little reception in our area, but as one goes up Green Mountain Drive toward the top, there are some spots where it is possible to get a signal. I have been advised by a Verizon customer service representative that a high-voltage transmission line on the north side of Green Mountain would reduce what little cell reception we have by approximately 50%. This situation would be more than inconvenient; it could be dangerous. Some of my neighbors have no land line; they have Skybeam phone service, which utilizes the internet. If their internet service goes down (as it sometimes does), their only way of communicating with the outside world (short of leaving home) is by cell phone. During times of severe fire danger, I have often carried my cell phone with me on my walks, so that I can call 911 if I see smoke. It appears that Alternative A would not only increase our fire risk, it could also decrease our ability to respond rapidly in the event of a fire. A third issue is that of cell phone reception. Currently, we have little reception in our area, but as one goes up Green Mountain Drive toward the top, there are some spots where it is possible to get a signal. I have been advised by a Verizon customer service representative that a high-voltage transmission line on the north side of Green Mountain would reduce what little cell reception we have by approximately 50%. This situation would be more than inconvenient; it could be dangerous. Some of my neighbors have no land line; they have Skybeam phone service, which utilizes the internet. If their internet service goes down (as it sometimes does), their only way of communicating with the outside world (short of leaving home) is by cell phone. During times of severe fire danger, I have often carried my cell phone with me on my walks, so that I can call 911 if I see smoke. It appears that Alternative A would not only increase our fire risk, it could also decrease our ability to respond rapidly in the event of a fire. ALTERNATIVES C/D Currently, the north transmission line goes almost directly over my next-door neighbor's house. Although it is very close to my house, it is not visually obtrusive for me, because it is downslope from my property. Alternatives C or D would move it further away, but might also mar my view, depending on the exact location of the poles. Even so, my major concern about C and D is not so much the view, but the fate of the old schoolhouse on County Road 18E. The schoolhouse was built in 1910 – so it belongs to an era that was even before my mother's time. The current owners bought it in order to restore it as a historical site. Several years ago, they gave an open house for the community. My mother and I went to the open house, and saw the inside of the building, as well as photographs showing what it looked like when it was still in use as a schoolhouse. Alternatives C or D would likely put an end to the restoration plans. This would harm not only the owners, but all – including myself – who care about remembering the past. How sad it would be to lose this unique historical and cultural resource.	Alternative A was not selected to be a part of the Agency Preferred Alternative in this area. Members of the public at the routing workshops hosted by Western identified Alternative A as an option they wanted Western to analyze. Western did so, and found a number of issues with access, steep slopes, and constructability, among others. Alternative B on the east end of the proposed Project has been included as part of the Agency Preferred Alternative. EMF from modern transmission lines is at a very low 60 hertz, far lower than the 800-2,500 megahertz ultra-high frequency ranges used by cell phones. EMF at 60 hertz do not cause cell phone or landline interference. In fact, cell phone transmitter/receiver equipment found on typical cell towers is routinely mounted to transmission line structures in developed areas where space is limited. For similar reasons the transmission line would not affect radio or TV frequencies. In isolated instances loose or damaged conductors or hardware can cause arcing, which can result in broadband interference at close distances. Once reported these issues are easily resolved. Removal of the section of existing line through the subdivision is part of all alternatives. One pole of each structure and a fiber optic ground wire would be left in place to maintain communications with the Bureau of Reclamation's dam. Alternatives C and D were designed to accomplish the removal of the line in the neighborhood with minimal relocation and maximum use of existing ROW. After consideration of all of the factors Western must take into account, including public input, Alternative B was selected as part of the Agency Preferred Alternative in this area. This alternative would avoid the Pinewood Schoolhouse. For a discussion of the rationale used for selecting the Agency Preferred Alternative, please see **Section 2.8** of the Final EIS. An underground alternative for the western end of the Project was not selected. The commenter's suggestion is not a viable option as a result of the short ruling span, fire risk, increased visual impact, and increased maintenance of the double-circuit 115-kV wood-pole H-frame structures. Self-weathering steel monopoles were considered, and resemble wood poles in color. Opinions vary as to whether self-weathering or galvanized poles are visually superior; however, the latest field experience information from the utility industry on self-weathering structures indicates that ongoing corrosion weakens these structures, therefore shortening their expected service life. For this reason, and the fact the Forest Service prefers dull galvanized steel, self-weathering steel structures would not be used for this project. Commenter is correct that 40-odd years of research has not demonstrated a link between EMF exposure and human health effects. While some suggestions of a relationship have been reported, the degree of association has been weak, and study results have not been replicated, a critical factor in scientific proof. The transmission lines would be designed to minimize EMF and would produce electric fields that are 70 percent less at the edge of the ROW than the existing lines, due to the cancellation effects from conductor arrangement on double-circuit lines. Additionally, the new double-circuit line would reduce magnetic field levels to less than the existing H-frame line within a 110-foot ROW. Alternative B has been included as part of the Agency Preferred Alternative, but not because of EMF concerns. As detailed in **Section 4.14.3.5**, the maximum induced electrical field of any of the proposed alternatives is estimated at 0.5 kV/m, well below the estimated interference threshold of 3.4-kV/M. Therefore, with operation at 115 kV, the proposed project would not pose a risk to pacemaker wearers. A more detailed description of EMF as they relate to potential health effects is found in **Sections 3.14.1.3** and **4.14.5.1**. EMF is further expounded upon in **Appendix D**.	Pamela Mausner, MD

	Section of Route	Alternative	Public or Agency	Comment	Response	Author
				ALTERNATIVE B In the Pinewood area, this alternative corresponds to the current south transmission line, running through the ranchlands on the south side of Pinewood Reservoir. As outlined in the group statement, the already-existing RoW is adequate; it is also easy to access because the terrain is relatively flat and open, with few trees. With this alternative, the transmission lines would be a good distance away from our subdivision. Even with the taller steel monopoles, I believe the view from the subdivision and from County Road 18E would be minimally impacted. Understandably, the ranchers do not want Alternative B. However, it is my understanding that the RoWs and transmission lines were already present when they purchased those properties. It's like buying a house near an airport, and then complaining about the noise. Furthermore, to offload the transmission lines onto a new group of landowners (as in Alternative A), who bought their homes with no expectation that this could ever happen, would be extremely unfair. This deeply violates my sense of justice. What's more, some of my friends are among the people who would be most severely impacted by Alternative A – and if they are harmed, then so am I. For these reasons (as well as those discussed below in my statement about possible health effects), I feel strongly that, for the Pinewood Reservoir area, Alternative B is the only acceptable alternative. The ideal solution would be to bury the lines through the ranchland and open space areas. I understand that the Estes Park end of the project will have buried lines, but this is considered not to be cost effective on the Pinewood end. In that case, I strongly recommend the use of wooden H-frames, rather than steel monopoles, in the ranchland and open space areas. Although taller than the current structures, the H-frames would blend in much better than steel monopoles so that, visually, they would not be much worse than what we have now -- and might even be better, because there would be fewer of them. This would ameliorate the impact on the ranchers, as well as on subdivision residents who may be concerned about having the monopoles in their viewshed. POSSIBLE HEALTH EFFECTS OF HIGH-VOLTAGE TRANSMISSION LINES The presence of transmission lines in populated areas raises the issue of possible health effects. When I first learned of the Estes-to-Flatiron Transmission Lines Rebuild Project 2 years ago, I scanned the medical literature and submitted comments to WAPA summarizing what I found. Recently, I updated my previous literature search. Although time limitations do not permit a comprehensive review, I believe I have a good overall impression of where these issues currently stand. In the following comments, I will focus on two persistent concerns: childhood leukemia and interference with cardiac pacemakers. Childhood leukemia To summarize: In 2014, it is still unclear whether exposure to high-voltage transmission lines causes childhood leukemia – and, if it does, how far away from the lines the risk extends. Further research is needed to resolve these uncertainties. Meanwhile, the safest course of action is to locate high-voltage transmission lines as far away as feasible from more populated areas. For the Pinewood Reservoir area, this would best be accomplished by choosing Alternative B. Cardiac pacemakers and defibrillators It is well known that EMFs at power line frequencies (50-60 Hz) can interfere with pacemakers and defibrillators. Whether or not electromagnetic interference (EMI) occurs depends on numerous variables, including: [THOSE LISTED IN COMMENT] Multiple experts have concluded that, with appropriate pacemaker settings, symptomatic or dangerous EMI due to transmission lines is unlikely to occur in everyday life – but that the possibility cannot be completely ruled out, especially with unipolar pacemakers.	Alternative A was not selected to be a part of the Agency Preferred Alternative in this area. Members of the public at the routing workshops hosted by Western identified Alternative A as an option they wanted Western to analyze. Western did so, and found a number of issues with access, steep slopes, and constructability, among others. Alternative B on the east end of the proposed Project has been included as part of the Agency Preferred Alternative. EMF from modern transmission lines is at a very low 60 hertz, far lower than the 800-2,500 megahertz ultra-high frequency ranges used by cell phones. EMF at 60 hertz do not cause cell phone or landline interference. In fact, cell phone transmitter/receiver equipment found on typical cell towers is routinely mounted to transmission line structures in developed areas where space is limited. For similar reasons the transmission line would not affect radio or TV frequencies. In isolated instances loose or damaged conductors or hardware can cause arcing, which can result in broadband interference at close distances. Once reported these issues are easily resolved. Removal of the section of existing line through the subdivision is part of all alternatives. One pole of each structure and a fiber optic ground wire would be left in place to maintain communications with the Bureau of Reclamation's dam. Alternatives C and D were designed to accomplish the removal of the line in the neighborhood with minimal relocation and maximum use of existing ROW. After consideration of all of the factors Western must take into account, including public input, Alternative B was selected as part of the Agency Preferred Alternative in this area. This alternative would avoid the Pinewood Schoolhouse. For a discussion of the rationale used for selecting the Agency Preferred Alternative, please see **Section 2.8** of the Final EIS. An underground alternative for the western end of the Project was not selected. The commenter's suggestion is not a viable option as a result of the short ruling span, fire risk, increased visual impact, and increased maintenance of the double-circuit 115-kV wood-pole H-frame structures. Self-weathering steel monopoles were considered, and resemble wood poles in color. Opinions vary as to whether self-weathering or galvanized poles are visually superior; however, the latest field experience information from the utility industry on self-weathering structures indicates that ongoing corrosion weakens these structures, therefore shortening their expected service life. For this reason, and the fact the Forest Service prefers dull galvanized steel, self-weathering steel structures would not be used for this project. Commenter is correct that 40-odd years of research has not demonstrated a link between EMF exposure and human health effects. While some suggestions of a relationship have been reported, the degree of association has been weak, and study results have not been replicated, a critical factor in scientific proof. The transmission lines would be designed to minimize EMF and would produce electric fields that are 70 percent less at the edge of the ROW than the existing lines, due to the cancellation effects from conductor arrangement on double-circuit lines. Additionally, the new double-circuit line would reduce magnetic field levels to less than the existing H-frame line within a 110-foot ROW. Alternative B has been included as part of the Agency Preferred Alternative, but not because of EMF concerns. As detailed in **Section 4.14.3.5**, the maximum induced electrical field of any of the proposed alternatives is estimated at 0.5 kV/m, well below the estimated interference threshold of 3.4-kV/M. Therefore, with operation at 115 kV, the proposed project would not pose a risk to pacemaker wearers. A more detailed description of EMF as they relate to potential health effects is found in **Sections 3.14.1.3** and **4.14.5.1**. EMF is further expounded upon in **Appendix D**.	
Socioeconomics	West		Public	It is my opinion that constructing a large power line above the Meadowdale Hills subdivision would constitute a large intrusion into the valuation of the properties in that area and could be viewed as "takings" in Colorado. Please consider the contents of the letter and respond per your best judgement to the large number of homeowners and property owners in the Estes Park Valley, especially Meadowdale Hills Subdivision.	Alternatives that maximize the use of existing ROWs are considered to have the least economic effects. Any influence on property values should already be factored into the current existing valuation due to the presence of the existing transmission line, and the easement is already an encumbrance on the property. The replacement of an existing line with a new one should not have a substantial effect on a given property, and landowners have an opportunity to adjust the location of structures on their properties to better suit their needs (within certain engineering constraints). It is Western's goal to have the least possible effect to individual landowners, subdivisions as a whole, and businesses. The economic effect of the proposed project is detailed in **Section 4.13**. In order to reduce visibility, special design measures would be considered for the Meadowdale Hills subdivision, including the use of structures with a lower height and shorter span. Lower height structures, if selected, would be approximately 10 to 20 higher than the existing H-frame wooden poles. Visual simulations of the structures are depicted in **Appendix C**. Rationale for the selection of the Agency Preferred Alternative is detailed in **Section 2.8**.	Carol Barsch Bontrager
Visual	West	General	Public	3.12.1.1 Visual Resource Definitions Scenic Attractiveness - Identifies Classes A -C with A = distinctive, B = typical and C = Indistinctive. Based on these classification I strongly disagree with the Table 3.12 - 1 classification of Estes Park as a Class B (typical) Scenic Attractiveness. With over 3 Million visitors a year and scenic overlooks of the Estes Valley, Estes Park is definitely NOT a "typical" Visual Resource! I can only believe that the Scenic Attractiveness classification was driven by a desire to decrease the importance given to the visual degradation of the proposed 105' power line structures in the final EIS.	The Scenic Attractiveness inventory was completed by a contractor (ViewPoints West) for the USFS in 2009 and was based on the characteristic landscape at that time, without regard for future changes to the landscape. That study was completed before this Project was proposed, so Western had no input in the analysis. The study results were independent of the proposed Project.	Todd Pllummer

	Section of Route	Alternative	Public or Agency	Comment	Response	Author
Visual	West	General	Public	3.12.2.4 State and Local Visual Resource Guidance It is stated that, "Ridgeline protection areas have been designated at the entrances to the valley. Developments in these areas require a special review process. The proposed project does not cross a designated ridgeline protection area." The implication is, since the project "does not cross" a designated ridgeline protection a area" that ridgeline protection isn't of concern. In fact the ridgeline protection areas, by their very existence, indicate the importance of not creating structures that impact the visual integrity of the ridgeline views. The ridgeline protection areas were created for development that complies with existing zoning height limits. Since the transmission line structures are many times the zoning height limits they need to be assessed based on the intent of the zoning regulations. The ridgeline protection areas for 105' tall structures would far exceed the current designated protection areas.	Thank you for your comment. The designated ridgeline protection areas are important components of scenery management, however, none of the project alternatives cross a designated ridgeline protection area.	Todd Pllummer
Visual		A2/C1	Public	Appendix C Key Observation Points and Visualizations KOP 12 Underground Variant A2/C1 This visualization shows the Transition Structure required to go from the overhead lines to underground cables. The height of the Transition Structure shown is 108'. The height of the Transition Structure has a huge impact on the analysis of the impacts of proposed alternatives. Seeing a 108' structure towering above everything else in the visualization, makes one think that "It isn't worth it, if that is what it will look like." My research indicates that 115kv transition structures are more typically 50' - 80' in height. That could make a dramatic difference in the "assessed value" of a design alternative.	Thank you for your comment. The height (108') used in the simulation is the conservative or "worst-case' visualization of the project. Lesser heights could actually be used, depending on the outcome of design and engineering. A shorter structure would of course be less visually intrusive, and micro-siting to take advantage of vegetative screening or topography could further lessen effects. However, shorter structures mean shorter span lengths to maintain necessary ground clearance, and more structures per mile.	Todd Pllummer
General and Visual	All	D	Public	There seemed to be little effort put toward minimizing the impact of the reconstruction project. The design seems to be based on decisions that are never mentioned nor alternatives considered. For instance, Option D suggests that the line could be rebuilt with poles of comparable heights to the existing poles, but no visualizations or costing was provided for a rerouting option with shorter poles. Why are all of the rerouting proposals for 105' poles? There are "visually critical" areas along this rebuild proposal that could benefit from reduced pole heights. Isn't that an option worthy of consideration?	Western disagrees with the commenter's first point - the entire EIS process is designed to identify and analyze environmental impacts. Simulations for Alternative D were not considered necessary because that alternative would simply rebuild both lines as they now are. Costing of shorter steel structures was not possible because it has yet to be determined where the use of shorter structures would be considered. Shorter poles require more structures per mile, and there is considerable difference of opinion whether more shorter structures is visually preferable to fewer but taller structures. The taller structures are required for double-circuit lines and were used in the analysis because tall poles represented a worst case scenario for impact most calculations. Shorter structures would be considered during the design and engineering process where advantageous. Conductor-to-ground and circuit-to-circuit clearances are mandated by regulation for safety and reliability reasons, and those clearances establish structure heights. Structures must be high enough to maintain minimum conductor clearance at mid-span and maximum electrical loading (the more current, the more heat, and the more heat, the more the conductors expand and sag). Somewhat shorter structures are an option, but in order to manage necessary conductor clearances, the trade-off is more structures. So the choice becomes one of more structures per line mile that are a few feet shorter or fewer structures that are a few feet taller. Western did not present a preference in the Draft EIS because public input was desired before making that decision; perceptions of visual impact are highly personal and vary widely. Decisions on structure heights would be made based on many factors, including public input and visual resource professional judgement.	Todd Pllummer
Visual	East	A	Public	Alternative A, as proposed, would run poles and lines parallel and adjacent to our northern property line. The 110' easement and the forest clearing for the lines as well as the road access for each power pole would unnecessarily add another scar to the landscape of the Pinewood area. Alternative A would be over some of the steepest and roughest terrain of anywhere along the Front Range foothills.	Alternative B has been selected as part of the Agency Preferred Alternative in this area.	Gary Bragdon
Vegetation and Visual	East	A	Public	Unique to anywhere I know of along the Front Range foothills is a forest of Douglas Fir on our land and our neighbor's land and Alternative A would slice through the very middle of these trees south of the 2010 burn area. This forest escaped the 2010 fire and now WAPA wants to cut a 110' swath through it.	The exact route that Alternative A would take around the back side of Green Mountain was never established, and siting could take into account the presence of Douglas fir trees and avoid them to the extent possible. However, Alternative A was not included in the Agency Preferred Alternative.	Gary Bragdon
Soils and Wildlife		A	Public	Road access to install and maintain the power poles and lines for Alternative A would create uncontrollable erosion issues due to the 25% to 70% grade of the west side of the mountain. There are caves on the west side of the mountain that native animals habitat that would surely be disrupted with the construction and maintenance of the power lines and poles.	Western analyzed Alternative A and found a number of issues with access, steep slopes, and constructability, among others. Alternative A was not selected to be a part of the Agency Preferred Alternative. Alternative B on the east end of the proposed Project has been included as part of the Agency Preferred Alternative.	Gary Bragdon

	Section of Route	Alternative	Public or Agency	Comment	Response	Author
General and Socioeconomic		A	Public	We understand the need to upgrade the power transmission lines but we do not understand why, with all of the existing easements and power lines in place now, that we need to add a new scar to our landscape. The environmental, economic and logistical feasibility of Alternative A with all of the existing alternatives makes no sense to us.	Members of the public at the routing workshops hosted by Western identified Alternative A as an option they wanted Western to analyze. Western did so, and found a number of issues with access, steep slopes, and constructability, among others. Alternative A was not selected to be a part of the Agency Preferred Alternative. Alternative B on the east end of the proposed Project has been included as part of the Agency Preferred Alternative.	Gary Bragdon
General	West	A	Public	In this case virtually all the impacted PEOPLE (as well as other entities) are located along the /(North Line". This is recognized in the DEIS Executive Summary S-5 as the top two /(Key Issues" (property owners, customers, viewsheds, residential developments, etc). It should be noted (as shown at S-14) that Park Hill Subdivision is the only suddivision near Estes Park that is affected. Meadowdale Hills, mentioned there, has perhaps 100 vocal residents located well south, none of whom can see the affected area (except for approx. 5 or 6 houses located near the top of Pole Hill). Park Hill Subdivision (including residents on Mall Rd. and the Joel Estes Dr. community) encompasses: 1) Approximately 25 homes 2) An expanse of recreational trail located directly under the power lines 3) A church with many members 4) UTSD facilities and employees 5) Historical ranch (Crocker)	Alternatives that maximize the use of existing ROWs are considered to have the least economic effects. Any influence on property values should already be factored into the current existing valuation due to the presence of the existing transmission line, and the easement is already an encumbrance on the property. The replacement of an existing line with a new one should not have a substantial effect on a given property, and landowners have an opportunity to adjust the location of structures on their properties to better suit their needs (within certain engineering constraints). It is Western's goal to have the least possible effect to individual landowners, subdivisions as a whole, and businesses. In order to reduce visibility, special design measures would be locally considered, including the use of structures with a lower height and shorter span. Lower height structures, if selected, would be approximately 10 to 20 higher than the existing H-frame wooden poles. Rationale for the selection of the Agency Preferred Alternative is detailed in **Section 2.8**.	Gordon Pedersen
General	All	A/A1/A2/B/C/C1	Public	We are very much affected, having lived along or under 3 of the power lines for 76 years (1938) and would be shocked to see the addition of 3 more lines. Accordingly, we are very concerned with Alternative A, without Variant A1, and strongly recommend Alternative B or Alternative C. Variant A2 and Variant C1 would also be very favorable, but we recognize the higher cost factor in today's tight budgets.	The proposed Project would not add any new transmission lines to the area. Most of the alternatives would consolidate the two existing separate transmission lines into one line and abandon one of the existing rights-of-way. If Western understands the comment correctly, commenter is adjacent to one of the existing lines having three conductors. The proposed consolidated double-circuit line would have six conductors. Alternative B has been selected as part of the Agency Preferred Alternative in the eastern portion of the project area and Alternative C in the western portion of the project area.	Gordon Pedersen
Socioeconomics		C/A1	Public	Since cost is a major factor, we were pleased to see (Table S-2) that Alternative C and Alternative A1 are ranked numbers 1 and 2.	Thank you for your comment. **Table S-2** in the Draft EIS compared costs for the entire length of each alternative, and were not broken out by east, west, and center sections. In response to public comments, and because Western intended that the Agency Preferred Alternative could be a 'mix and match' of alternative segments from each section, new tables comparing alternatives at each end of the proposed Project have been developed for the Final EIS. Comparative costs for the West Alternatives are provided in **Section 2.4** of the Final EIS.	Gordon Pedersen
Visual	West	A/A1/A2/C1	Public	Alternati ve A/Variant A1/Underground A2/C1. Above are the alternatives that are best for the cummunity. The powerlines should stay along Highway 34. That is the right-of-way and there the gas line resides. The power lines should NOT be very visable along Highway 36. Estes Park is a tourist town and does not need the negative impact of 105 ft towers as visitors enter the town. The power lines should not go through the pole hill community. Most of these homes have great views and do not need to be looking through power lines.	Western is very much aware of the value residents place on the visual aspects of their environment. Alternative C, the Agency Preferred Alternative, has been selected for the western portion of the project area. New ROW would be required near U.S. Highway 36, which is intended to reduce visibility from the highway. The abandonment of one entire existing ROW is a feature of all alternatives except Alternative D and No Action, and would result in a substantial improvement to visual resources that would more than offset the incremental impact of taller structures on the other ROW. **Section 2.8** of the Final EIS addresses the rationale for Western's selection of its Agency Preferred Alternative. An underground option was not selected for the reasons discussed in that section.	Rainer Schelp
Land Use	All	A/B	Public	In relation to the decision on whether to use 'Plan A' and 'Plan B' in where to consolidate the two lines, please consider 'Plan B' the southern route to be the better. 1. Requires less access to private property over time. 2. Lessens WAPA's and property owners' liabilities. 3. Makes private property effected to be more appealing.	Thank you for your comment. Alternative B has been selected as part of the Agency Preferred Alternative.	Bob Sutherland
Visual	West	B/C	Public	I own property on Alpine Dr. in the Meadowdale development on Rt. 36 . It is incredibly important that any new transmission line does not encroach on the viewing field of mine and others properties in the development, or views from the road looking up to our properties.	Western is very much aware of the value residents place on the visual aspects of their environment. **Section 2.8** of the Final EIS describes the rationale behind the selection of the Agency Preferred Alternative. The abandonment of one entire existing ROW is a feature of all alternatives except Alternative D and No Action, and would result in a substantial improvement to visual resources.	Jerald Berman
Socioeconomic and Visual	West	B/C	Public	The economic impact of this would be devastating, dropping our land and home values tremendously. Their is a lot of land available through the national forest right behind us, and it would be very easy to put these lines out of sight and mind of the people living in Meadowdale. The only value to these properties is the view, period. Most of the properties have virtually no usable land to speak about, and were bought specifically for the spectacular view of the valley below, and the mountains above. Please do not ruin this with an unsightly transmission line.	Alternatives that maximize the use of existing ROWs are considered to have the least economic effects. Any influence on property values should already be factored into the current existing valuation due to the presence of the existing transmission line, and the easement is already an encumbrance on the property. The replacement of an existing line with a new one should not have a substantial effect on a given property, and landowners have an opportunity to adjust the location of structures on their properties to better suit their needs (within certain engineering constraints). It is Western's goal to have the least possible effect to individual landowners, subdivisions as a whole, and businesses. The economic effect of the proposed project is detailed in **Section 4.13**. In order to reduce visibility, special design measures would be locally considered, including the use of structures with a lower height and shorter span. Lower height structures, if selected, would be approximately 10 to 20 higher than the existing H-frame wooden poles. Visual simulations of the structures are depicted in **Appendix C**. Rationale for the selection of the Agency Preferred Alternative is detailed in **Section 2.8**.	Jerald Berman

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