CHAPTER 2
Project Description

2.1 Introduction

This EIR examines the environmental impacts associated with construction and operation of the Yreka-Weed Transmission Line Upgrade Project, Southern Portion (the "Proposed Project") and the Weed Segment. As described in more detail in the sections below, the Proposed Project would consist of upgrading approximately 0.7 miles of existing 69 kV transmission line to 115 kV, and construction of a new 1.6-mile section of 115 kV transmission line, approximately 1.2 miles of which no line currently exists. The Weed Segment would consist of upgrading approximately 1.5 miles of existing single-circuit 69 kV transmission line to a double-circuit 115 kV transmission line. The information presented here is intended to provide a detailed description of project construction and operation, serving to provide a common understanding of the project parameters in Section 4, where environmental impacts are evaluated.

2.2 Project Location

The EIR will examine the environmental impacts associated with construction and operation of the Proposed Project. The Proposed Project would consist of upgrading approximately 0.7 miles of existing 69 kV transmission line to 115 kV, and construction of a new 1.6-mile section of 115 kV transmission line, approximately 1.2 miles of which no line currently exists. The Weed Segment would consist of upgrading approximately 1.5 miles of existing single-circuit 69 kV transmission line to a double-circuit 115 kV transmission line.

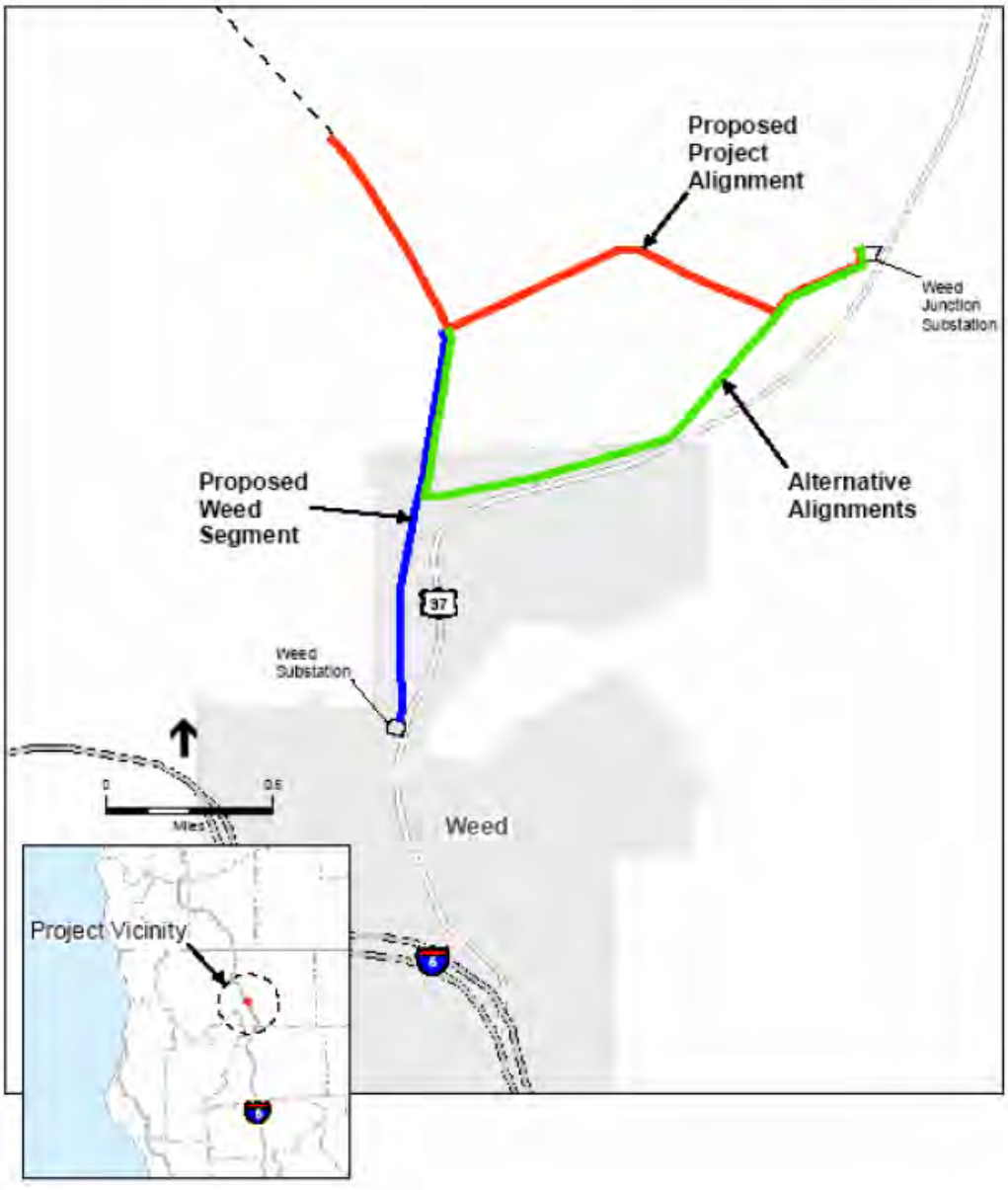
The Proposed Project is located in Siskiyou County, north of the City of Weed, California (Figure 2-1), and generally traverses open space within the valley floor of Mount Shasta. A portion of the Proposed Project route (approximately 0.7 miles) is within an existing PacifiCorp transmission line right-of-way. Approximately 1.2 miles of the Proposed Project route would require acquisition of new right-of-way, and crosses at least one stream channel.

The Weed Segment is located near the City of Weed, California, which is located where Highway 97 and Interstate 5 meet (Figure 2-1).

2.3 Existing System

PacifiCorp currently serves the Yreka-Weed areas by a system of substations and electrical power transmission lines as well as an extensive network of local distribution lines throughout the

Northern California and Southern Oregon region. These distribution lines generally follow city streets and back property lines carrying lower voltage electricity from the substations to PacifiCorp's residential and commercial customers. Figure 2-2(a) and Figure 2-2(b) illustrate the local PacifiCorp system as it exists now and as it would exist after construction of the Proposed Project and Weed Segment.

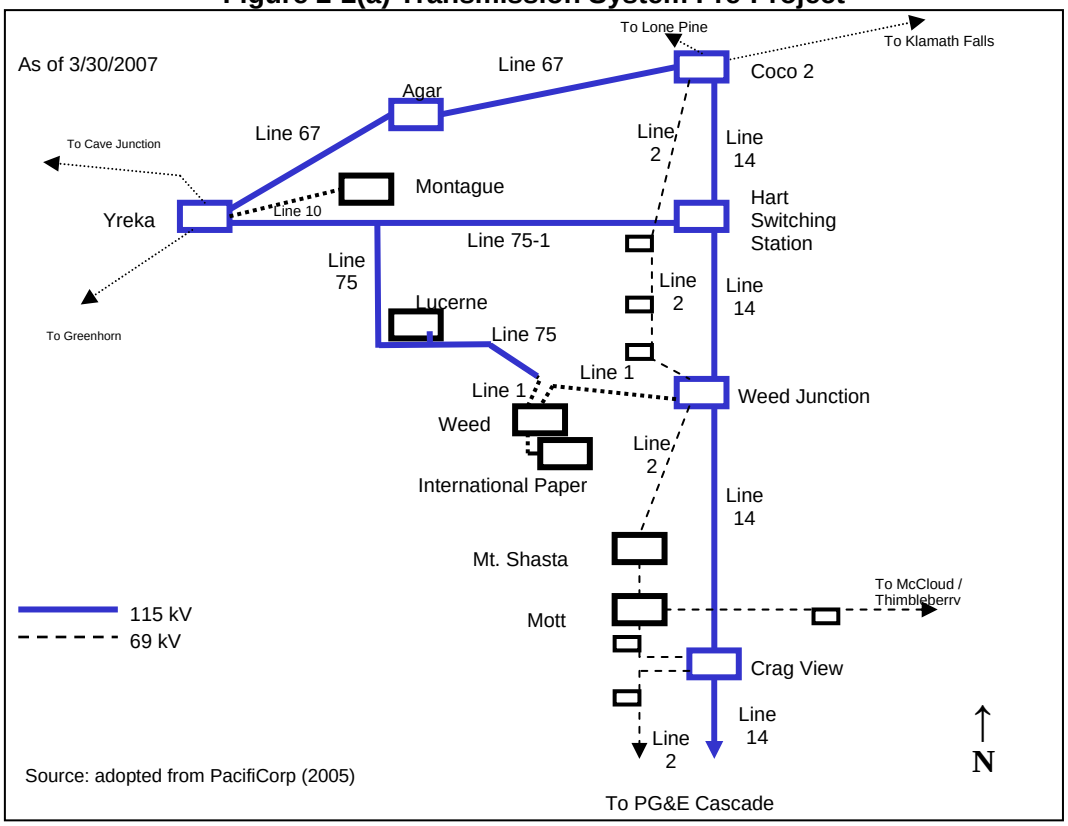


PacifiCorp's Yreka-Weed Transmission Line Upgrade Project. 205439

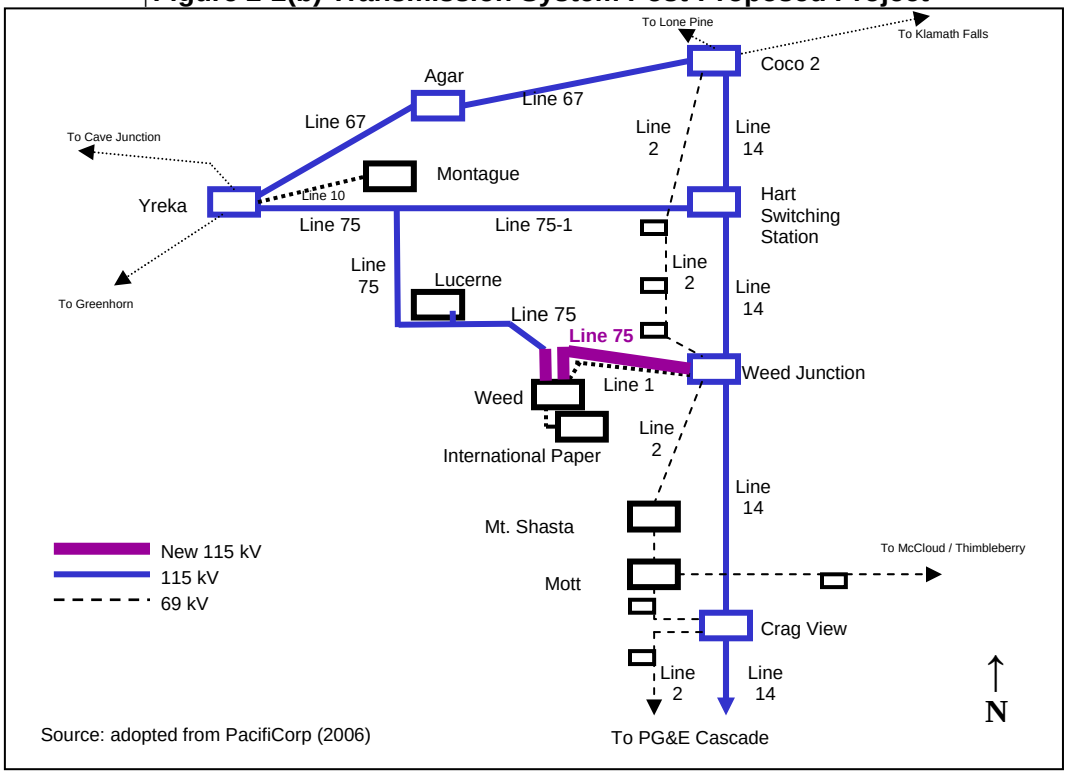
SOURCE: PacifiCorp (2006)

Figure 2-1
Project Location

Figure 2-2(a) Transmission System Pre-Project



↑Figure 2-2(b) Transmission System Post-Proposed Project



2.4 PacifiCorp's Proposed Project

Figure 2-3 shows the general location and alignment of the Proposed Project and Weed Segment. The Proposed Project alignment would cross open space along the valley floor of Mt. Shasta following the existing 69 kV right-of-way from Pole 15/44 for approximately 0.7 miles to Pole 8/45. At Pole 8/45, the line would traverse east for approximately 1.6 miles to the Weed Junction Substation. Approximately 1.2 miles of the 1.6-mile segment (from Pole 8/45 to approximately Pole 14/48) would require new right-of-way.

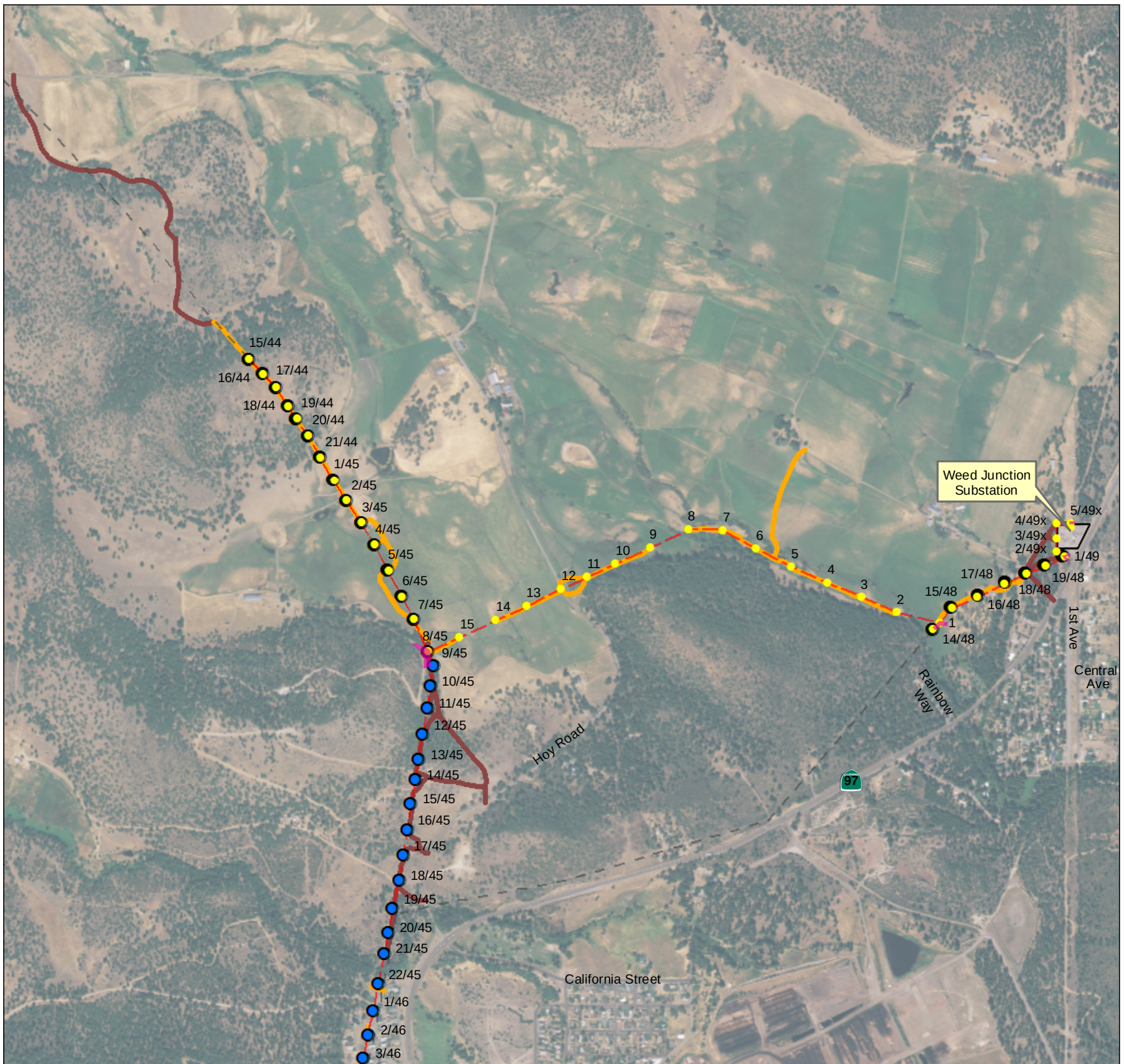
After the Proposed Project voltage conversion to 115 kV on Line 1, it would become part of Line 75 and would pass about 1.5 miles north of the existing Weed Substation. The 1.5-mile section of existing 69 kV Line 1 between the new Line 75 (at Pole 8/45) and the Weed Substation would remain in place but would be idle. The Weed Segment would rebuild that 1.5-mile idle line section to form a double circuit 115 kV loop on common structures. The Weed Segment would be constructed entirely within existing right-of-way.

2.5 Project Components

A summary of the key components of the Proposed Project is provided Table 2-1, followed by a more detailed discussion by component.

TABLE 2-1
SUMMARY OF PROJECT COMPONENTS

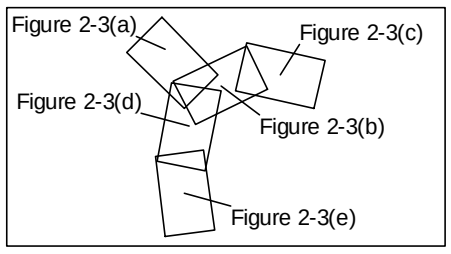
PROPOSED PROJECT
• Replace the existing single-circuit 69 kV transmission line with a single-circuit 115 kV line from Pole 15/44 to Pole 8/45 (requiring replacement of approximately 15 existing poles) • Install an approximately 1.6 mile new single-circuit 115 kV line from Pole 8/45 to the Weed Junction Substation (requiring installation of approximately 19 new poles and replacement of approximately 7 existing poles) • Increase conductor size to 795 aluminum conductor with steel reinforcement (ACSR) • Transfer existing distribution and telecommunication lines to the new wood poles; remove existing wood poles • Voltage of new circuit: 115 kV alternating current • Pole Type: wood poles, with approximately 4 self-supporting steel poles (see Appendix C) • Pole Height: generally 56 to 75 feet above ground surface (ags) • Span between Poles: approximately 200 to 250 feet where distribution is present (i.e., upgraded portion) and 400 to 600 feet where no distribution is present (i.e., new line).
WEED SEGMENT
Weed Substation • Construct a temporary 14+ MVA substation adjacent to the existing Weed Substation • Expand the substation fenced area and construct a new standard 115 kV to 12.5kV substation • Increase substation capacity from 12.5 MVA to 25 MVA • Remove temporary substation Transmission Line Upgrade • Build a double circuit 115 kV 1.5-mile transmission line within existing 50-foot right-of-way (requiring replacement of approximately 27 poles and installation of approximately 4 new poles) • Pole Type: wood poles, with approximately 4 self-supporting steel poles (see Appendix C) • Pole Height: generally 61 to 80 feet above ground surface (ags) • Transfer existing distribution underbuild to the new poles • Separate Line 75 at the tap point (Pole 8/45) to form a loop through the rebuilt Weed Substation



SOURCES: ESA (2007), PacifiCorp (2007)

PacifiCorp's Yreka-Weed Transmission Line Upgrade Project - Southern Portion. 205439

Figure 2-3
Overview Map - Proposed Project and Weed Segment



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2.5.1 Transmission Line

The Proposed Project would involve upgrading approximately 0.7 miles of the existing 69 kV single-circuit line with a new 115 kV single-circuit line from Pole 15/44 south to Pole 8/45 within the existing right-of-way (ROW). This portion of the line would require one-for-one replacement of approximately 15 wood poles, except for Pole 8/45 which would be replaced with a self-supporting steel pole (see Section 2.5.2).

Beginning at Pole 8/45 and heading east, the Proposed Project would involve construction of approximately 1.6 miles of new 115 kV single-circuit line. Between Pole 8/45 and where the new line would intersect the existing 69 kV Line 1 near Pole 14/48 (approximately 1.2 miles), no line currently exists and new ROW would be required. This section of new line would require 15 new poles. From Pole 14/48 northeast to the Weed Junction Substation (approximately 0.3 miles), the new line would be constructed in the existing ROW approximately 15 feet south of the existing poles. One-for-one replacement of approximately 7 poles would be required in this section, after which the existing 69 kV and local distribution lines would be transferred over to the new poles and the 7 old poles would be removed. Approximately 4 new poles would be required at the Weed Junction Substation (approximately 0.1 mile). All of the 26 new poles between Pole 8/45 to and including the Weed Junction Substation would be wood poles except for approximately three poles which would be self-supporting steel poles (see Appendix C). The route alignment, existing pole locations, proposed new pole locations, and tentative locations of pull/tension sites and access roads for the Proposed Project are shown in Figures 2-3(a) though 2-3(c).

The Weed Segment would involve replacing an existing 1.5-mile segment of 69 kV line with a double circuit 115 kV transmission line between approximately Pole 8/45 and the Weed Substation. Overall, the upgraded line would require one-for-one replacement of approximately 27 poles, plus approximately 4 new poles at the Weed Substation. The new Line 75 (constructed under the Proposed Project) would be split at the tap point (Pole 8/45) to create a loop through the rebuilt Weed Substation. The rebuilt line would be constructed so that one side could be maintained while keeping the circuit on the other side energized. The Weed Segment route alignment is shown in Figures 2-3(d) and 2-3(e).

All fences, metal gates, pipelines, etc. that cross or are within the transmission line right-of-way would be grounded to prevent electrical shock.

2.5.2 Poles

From Pole 15/44 south to Pole 7/45, the transmission line for the Proposed Project would be supported by wood poles which would be up to 24 inches in diameter (at the base) and generally range from 65 to 70 feet in height above ground surface (ags), which is approximately 22 to 36 feet higher than the existing poles. The self-supporting steel pole associated with Pole 8/45 would be approximately 48 inches in diameter and approximately 75 feet ags (see Figure 2-4).

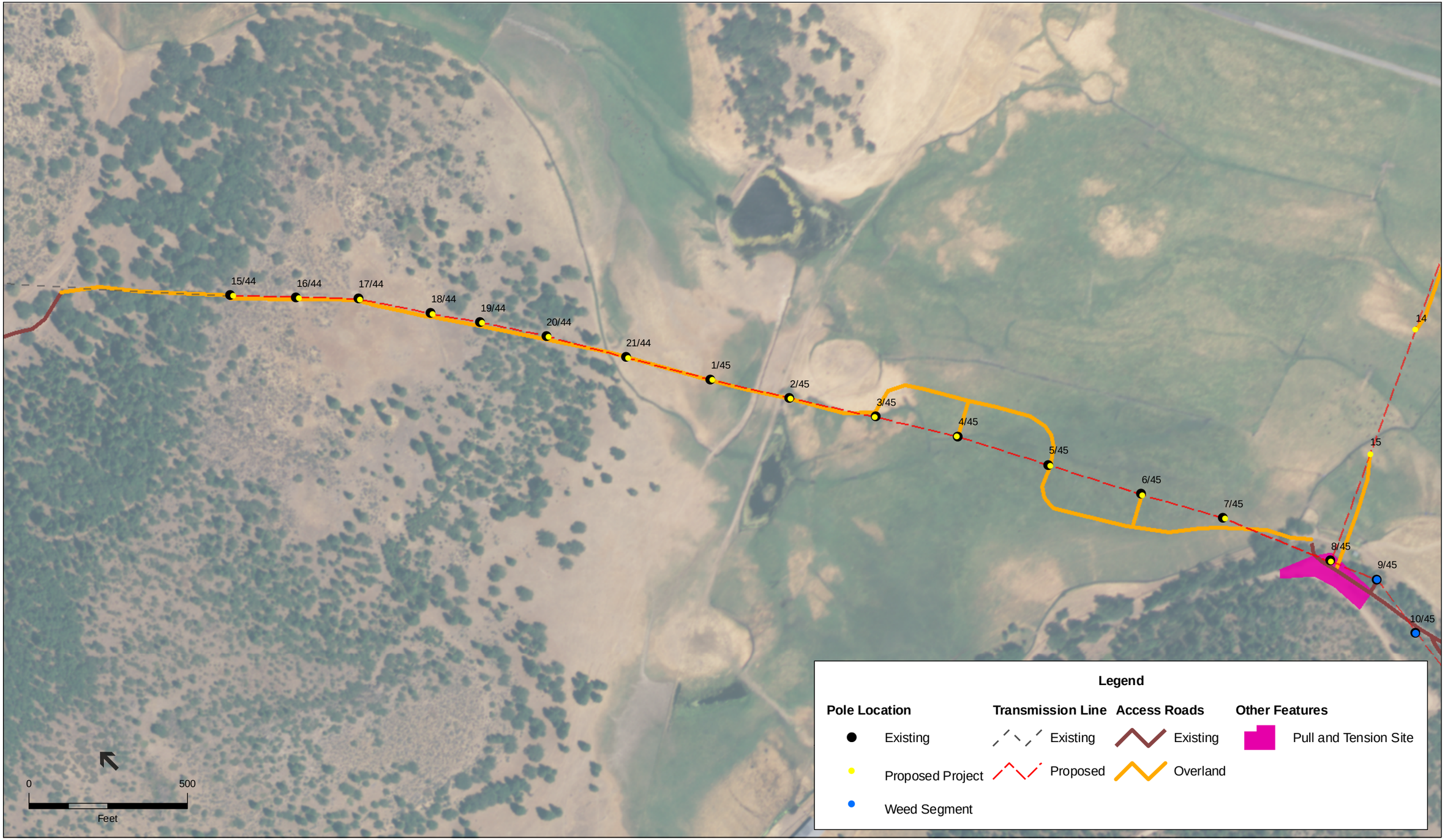
For the new 1.6 mile segment, wood poles up to 24 inches in diameter (at the base) and approximately 56 to 70 feet ags would be used, except at the new Pole 1 and the replacements for Poles 15/48 and 1/49, which would be self-supporting steel poles approximately 48 inches in diameter and approximately 70 feet ags.

For the Weed Segment, approximately 27 existing 43- to 61-foot ags wood poles would be replaced one-for-one with 61- to 80-foot ags wood poles. For both the Proposed Project and the Weed Segment, existing distribution underbuild would be transferred to the new poles in the upgraded sections. Also, for the Proposed Project from Pole 14/48 to the Weed Junction Substation (approximately 0.3 mile), the existing 69 kV Line 1 and distribution underbuild would be transferred over to the new poles. Appendix C describes the existing and proposed heights for the poles in both the upgraded and new portion of the Proposed Project and Weed Segment.

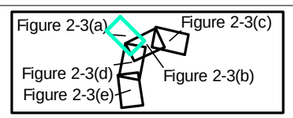
Three conductors would be installed on each pole for the single circuit 115 kV line. Figure 2-5 illustrates the proposed pole designs for the four most common types of poles that would be used for the Proposed Project and the Weed Segment; diagrams for all other pole types are included in Appendix C. Generally, Tangent poles (TF 100) would be used when the run of poles continues in a straight line. Structures at angle points (TF 103 and TF 135) would have conductors on one side of the pole and down-guys on the opposite side of the pole. When the new single circuit 115 kV line meets with the existing 69 kV line east of the Weed Junction Substation, the two circuits would be installed on new double circuit structures including self supporting poles for Pole 1, Pole 15/48, and Pole 1/49 to avoid the use of down-guys.

For the majority of the Weed Segment, double circuit poles (TF 171) would be used. Three conductors would be installed on each side of the pole. There would be two double circuit angle structures for the Weed Segment: Pole 3/46 would be a small angle double circuit structure (TF151) and Pole 12/46, near the Weed Substation would be a large angle structure (TF 152). Both these structures would be supported by down-guys and would replace existing single circuit guyed structures.

The minimum conductor height would be 21 feet ags for all structure configurations associated with the Proposed Project and Weed Segment. Span lengths between the poles would range from approximately 200 to 250 feet where distribution lines are present and 400 to 600 feet where no distribution lines are present. The wood poles would be direct embedded at a depth of 8 to 10 feet depending on load and soil characteristics. The new poles would be set either in the same hole as the existing pole or as close as possible (within approximately 10 feet) to the existing pole location, except for the new poles in the 1.6-mile segment where no poles currently are present. A six-foot by twenty-foot concrete foundation would be required for the self-supporting steel pole at 8/45. The other self-supporting steel poles for the Proposed Project and the Weed Segment would be direct embedded to a depth of approximately 20 to 25 feet. All steel poles would be self-weathering and would take on the appearance of wood color within a few months of installation.



SOURCES: ESA (2007), PacifiCorp (2007)



PacifiCorp's Yreka-Weed Transmission Line Upgrade Project - Southern Portion. 205439

Figure 2-3(a)
Proposed Project

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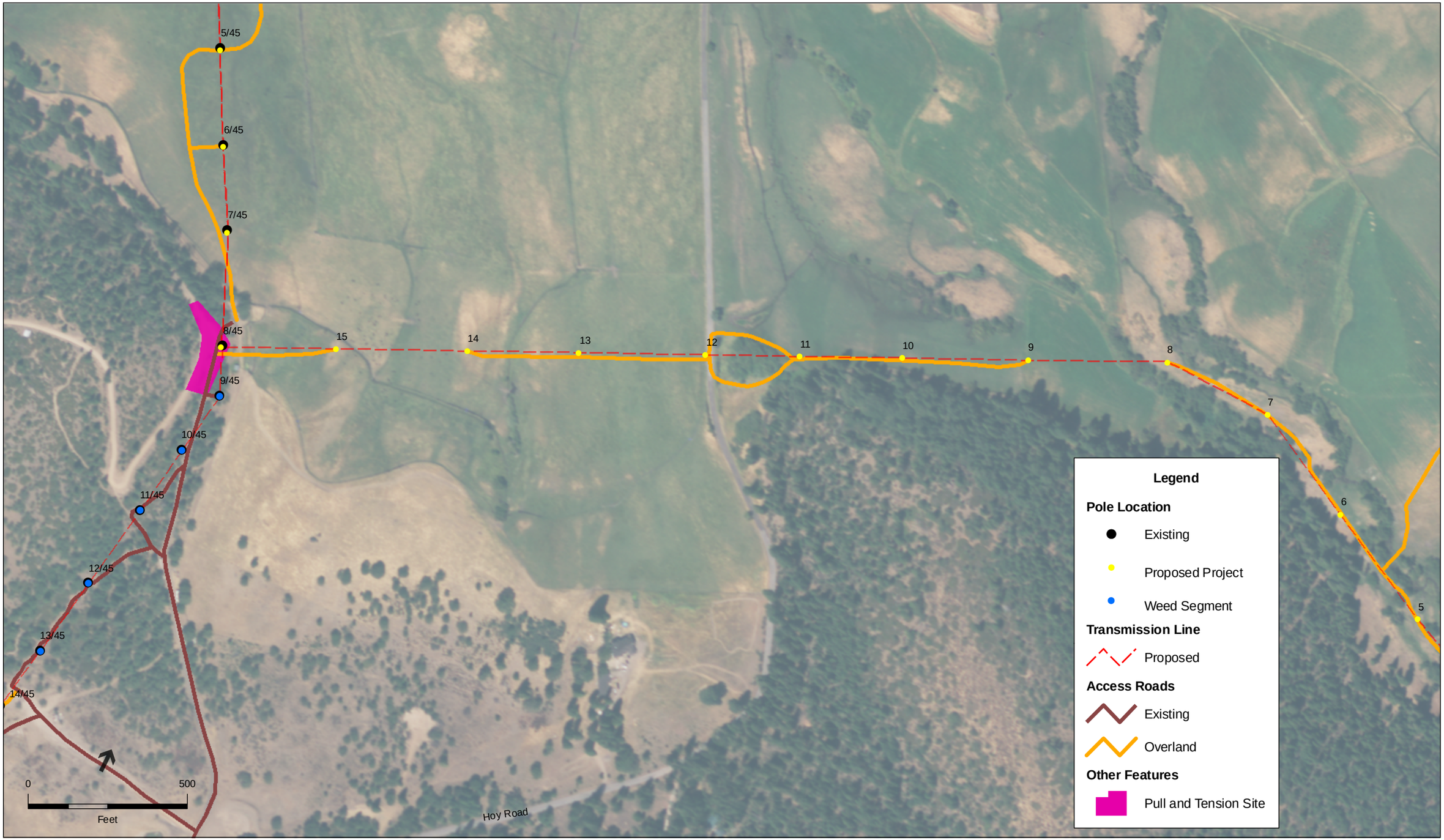
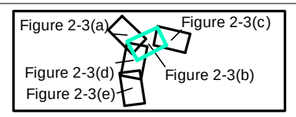


SOURCES: ESA (2007), PacifiCorp (2007)



PacifiCorp's Yreka-Weed Transmission Line Upgrade Project - Southern Portion. 205439

Figure 2-3(b)
Proposed Project

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Weed Junction Substation
5/49x
4/49x
3/49x
2/49x
1/49
19/48
18/48
17/48
16/48
15/48
14/48
1
2
3
4
5
6
7
8
97
1st Ave
Rainbow Way
0
500
Feet

Legend

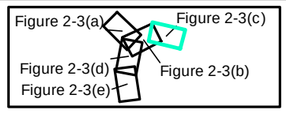
Pole Location
- Existing
- Proposed Project

Access Roads
- Existing
- Overland

Transmission Line
- Existing
- Proposed

Other Features
- Substation
- Pull and Tension Site

SOURCES: ESA (2007), PacifiCorp (2007)



PacifiCorp's Yreka-Weed Transmission Line Upgrade Project - Southern Portion. 205439

Figure 2-3(c)
Proposed Project

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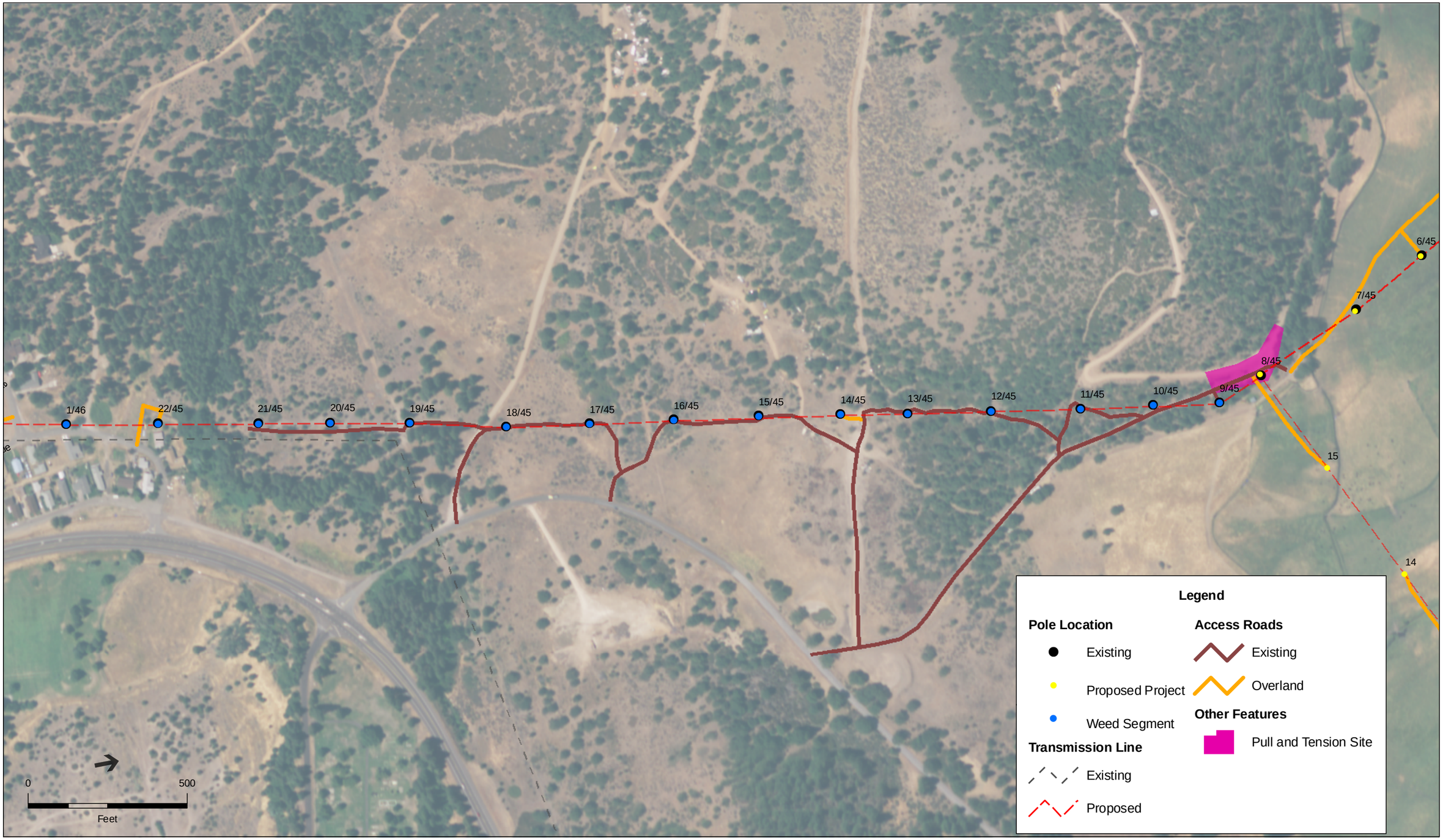
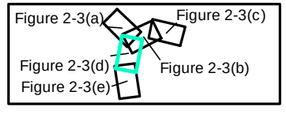


SOURCES: ESA (2007), PacifiCorp (2007)



PacifiCorp's Yreka-Weed Transmission Line Upgrade Project - Southern Portion. 205439

Figure 2-3(d)
Weed Segment

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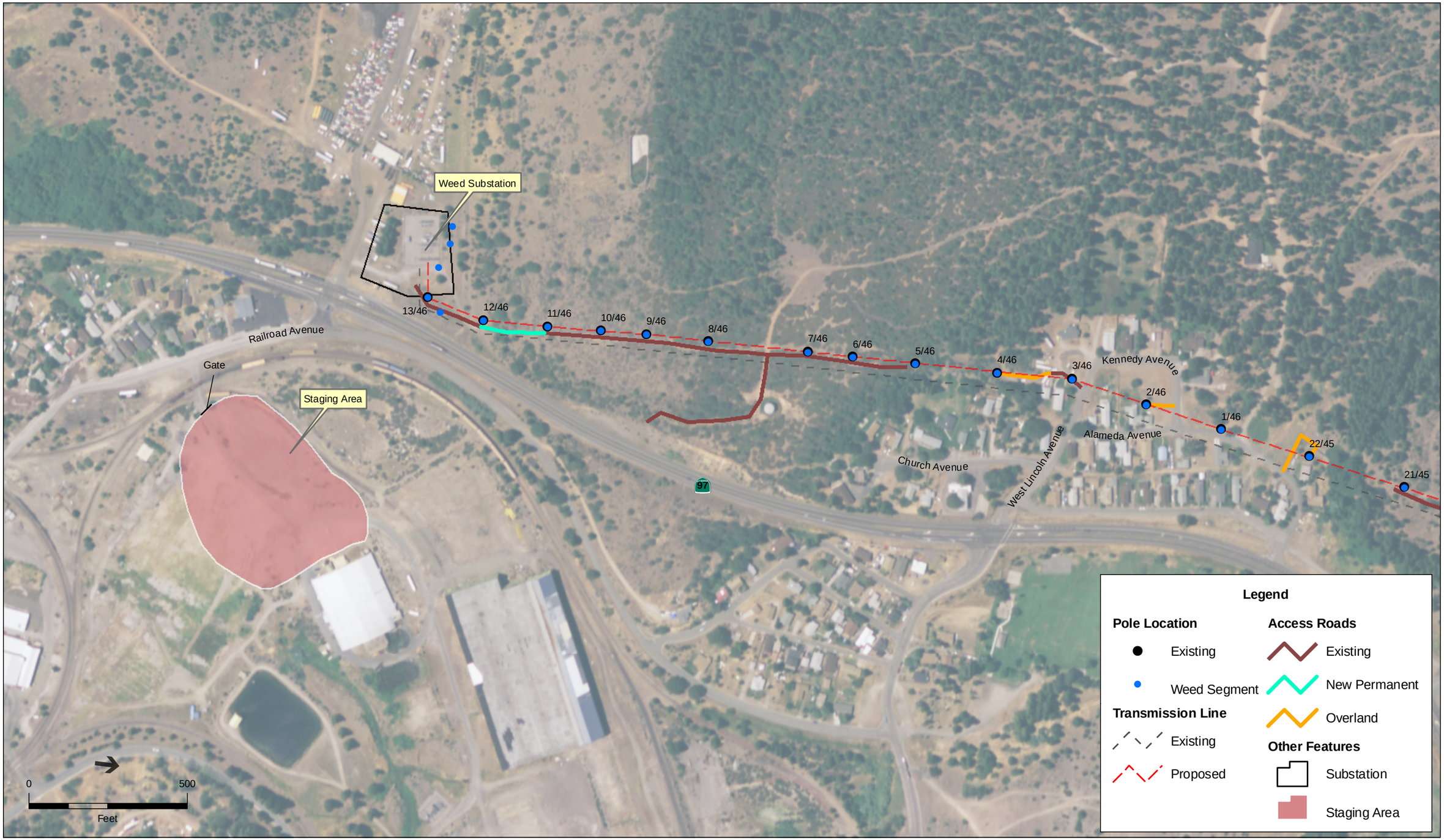
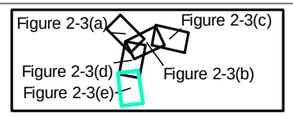


SOURCES: ESA (2007), PacifiCorp (2007)



PacifiCorp's Yreka-Weed Transmission Line Upgrade Project - Southern Portion. 205439

Figure 2-3(e)
Weed Segment

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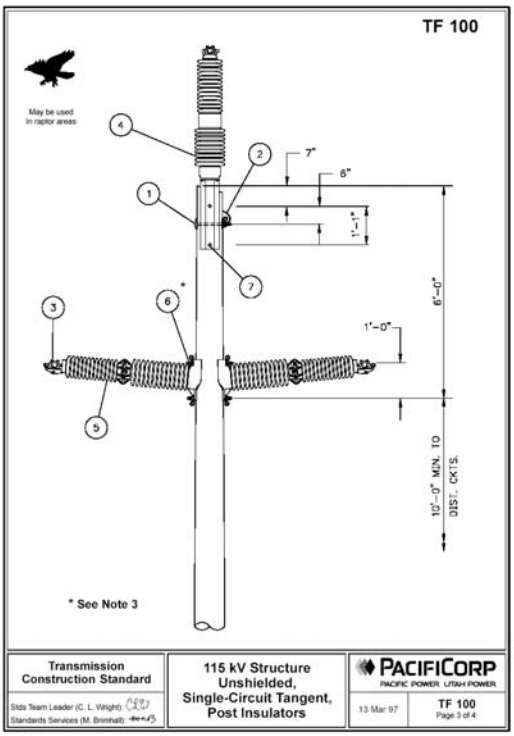
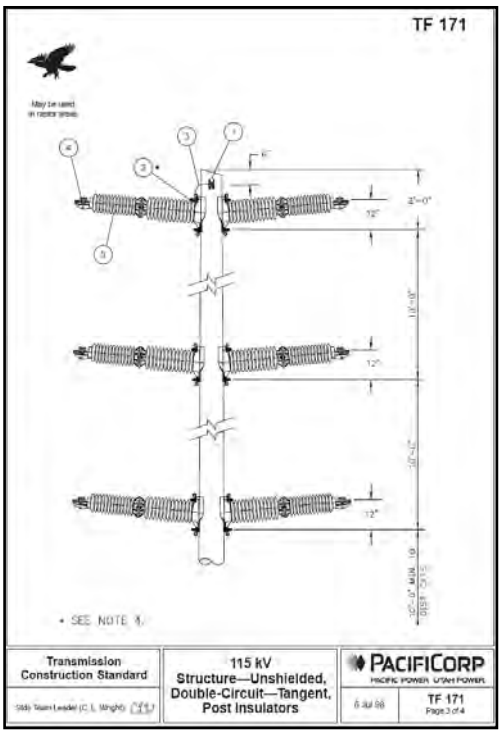
PacifiCorp's Yreka-Weed Transmission Line Upgrade Project. 205439

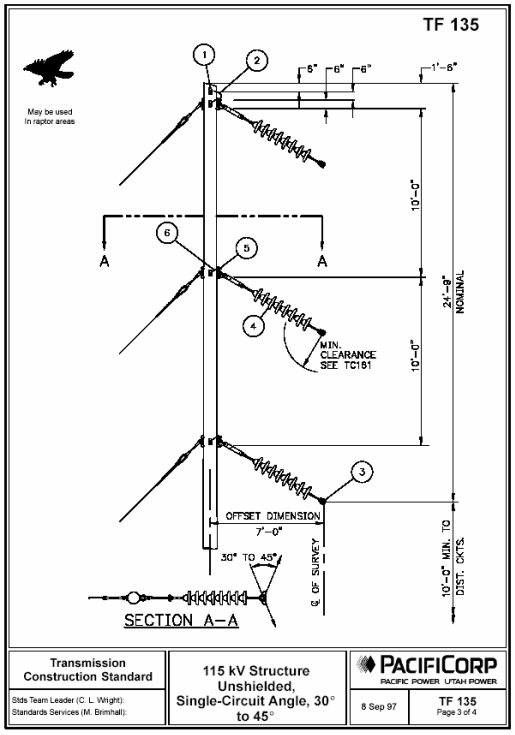
SOURCE: PacifiCorp (2006)

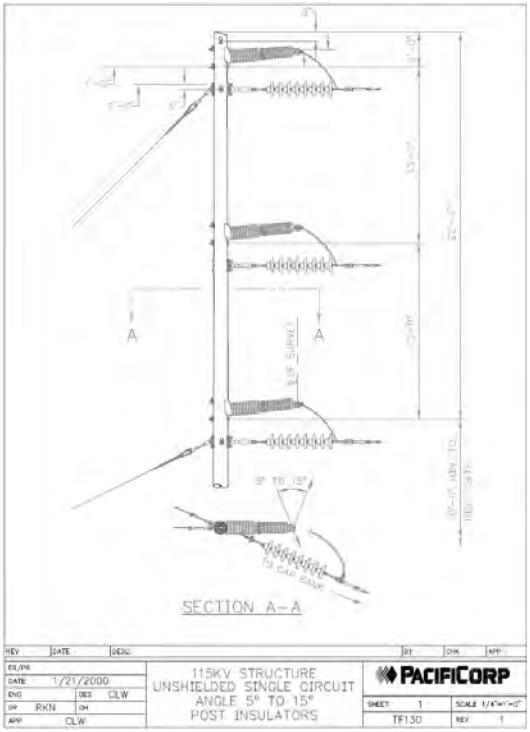
Figure 2-4

Graphical Representation of Proposed Pole 8/45









PacifiCorp's Yreka-Weed Transmission Line Upgrade Project. 205439

SOURCE: PacifiCorp (2006)

Figure 2-5
Typical Pole Designs

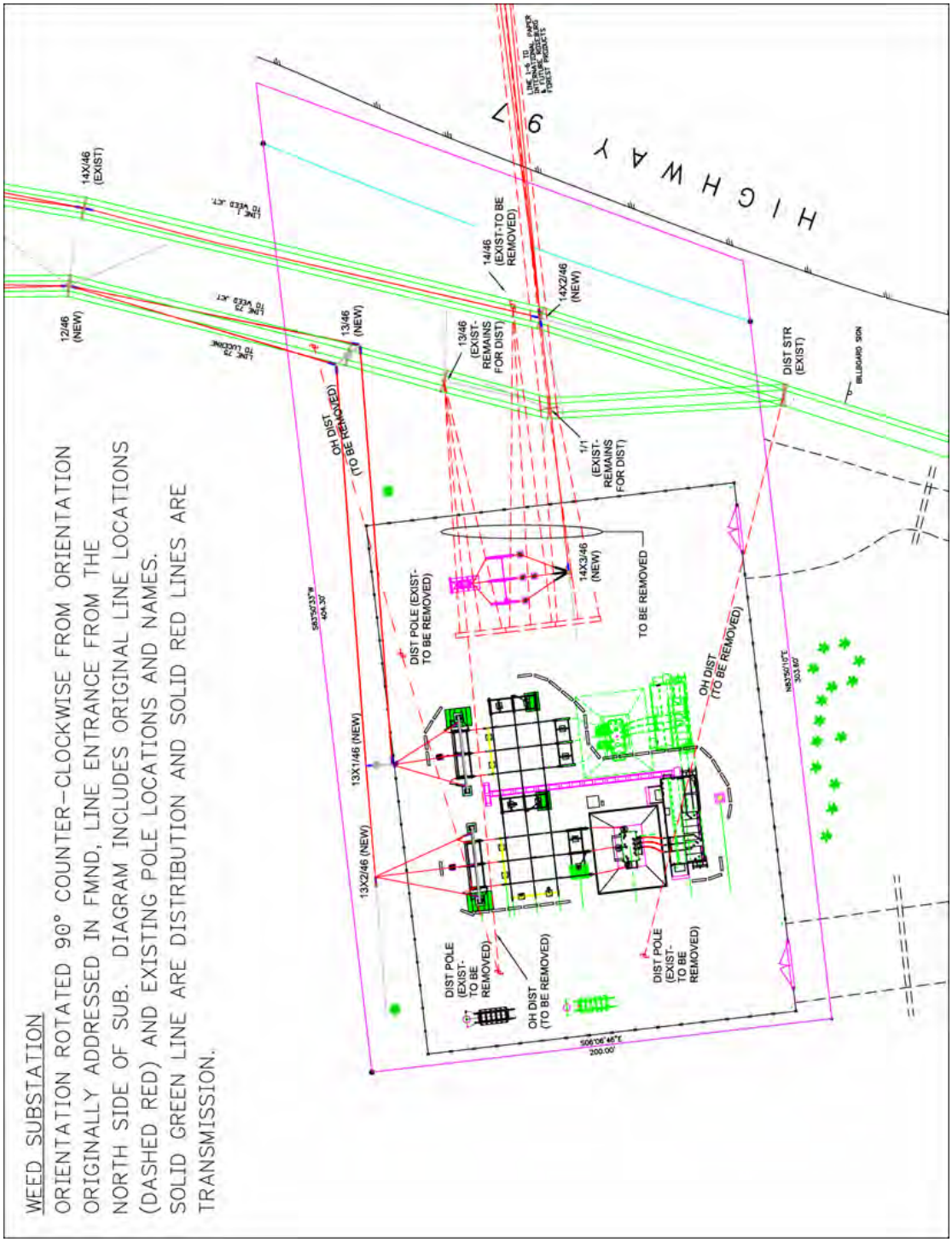
2.5.3 Weed Substation Modification

Rebuild of the Weed Substation as part of the Weed Segment would require construction of a temporary 14+ MVA substation using a mobile substation or spare equipment. The temporary substation would be constructed adjacent to the existing Weed Substation, within an expanded fenced area, but still would occur entirely on PacifiCorp-owned property. Approximately 900 cubic yards of soil would need to be removed from a small hill on the north side of the substation to accommodate the expanded fenceline.

All existing Weed Substation equipment, structures, and control house would be removed, except for the 69 kV and 12.5 kV capacitors and related equipment, which would remain in use following the rebuild. The rebuild design includes a layout to accommodate a second (future) transformer and space for a mobile transformer to back up either transformer. The rebuild would include two 115 kV 1200 amp motor operated switch positions, a 116 kV delta to 12.47 kV 25 MVA transformer, and metal clad switchgear for four feeder positions. The existing 12.5 kV capacitor would be reinstalled as a single stage unit. A new 69 kV tap would be constructed to connect to the existing 69 kV capacitor and equipment, and a 69 kV bypass would be constructed to provide service to the existing International Paper Company (Roseburg Forest Products) substation located on the east side of Highway 97, directly across from the Weed Substation. Two underground get-away runs would be constructed in new conduit to connect the metal clad switchgear with the two existing feeders. After construction of the rebuilt substation is completed, the temporary substation would be removed. As rebuilt, the Weed Substation would be PacifiCorp's standard low profile design, and would have a lower profile than the existing substation. Figures 2-6 provides a plan view of the proposed Weed Substation upgrade.

2.6 Right-of-Way Requirements

PacifiCorp owns 50-foot wide right-of-way (ROW) easements along the ROW for the existing 69 kV transmission line and would not require additional ROW for the upgrade portion of the Proposed Project. However, new ROW easements would be required for approximately 1.2 miles of the new 1.6-mile 115 kV segment, from Pole 8/45 to Pole 14/48 (see Figure 2-4(c)). Perpetual easements would be negotiated with and obtained from private landowners for this portion of the Proposed Project. The existing ROW from Pole 14/48 to the Weed Junction Substation (approximately 0.3 miles) would be shifted 15 feet to the north, which would require a perpetual easement to be negotiated with and obtained from one private landowner. The line to be rebuilt for the Weed Segment would be within the existing 50-foot wide ROW with the exception of the section of line between Pole 12/45 and 17/45 for which PacifiCorp would be required to obtain an easement.



PacifiCorp's Yreka-Weed Transmission Line Upgrade Project. 205439

SOURCE: PacifiCorp (2007)

Figure 2-6

Weed Substation Modification Plan View

2.7 Construction

This section describes construction methods to be used along the 115 kV transmission line route for the Proposed Project and the Weed Segment, including the Weed Substation rebuild.

2.7.1 Transmission Line Construction

Construction would require establishment of a staging area, work areas, pull and tension sites; and access to pole sites and pull and tension sites along the transmission line route. For all wood pole locations, construction of the 115 kV transmission line would include digging a hole, assembling the wood pole (i.e., adding arms, insulators, etc.), installing the pole and subsequently stringing a new 795 ACSR conductor and 115 kV insulation for the 115 kV circuit. The steel pole at 8/45 would require an excavation approximately 6-feet in diameter by 20-feet deep in which a concrete foundation would be poured (see Section 2.7.1.6).

2.7.1.1 Staging Area

An approximate four-acre staging area, located at the Roseburg Forest Products plant across Highway 97 from the Weed Substation (Figure 2-3) would be required for materials and equipment storage as well as staging of construction activities for the Proposed Project and Weed Segment, with the exception of the Weed Substation modification which would be staged within the property line of the Weed Substation. The staging area would serve as a field office, reporting location for workers, parking area for vehicles and equipment, and a site for temporary marshalling of construction materials, and temporarily would be fenced. A construction trailer and/or tool trailer would be located on the site. The proposed staging area has previously been used by others and would require no surface preparation or installation of rock base. No modifications to the existing road entrance would be required.

If power is required, PacifiCorp would to tap into an existing 2.3 kV distribution line available at the Roseburg Forest Products plant. This may require the installation of up to two temporary poles depending on the location of the construction trailer.

Approximately 80 feet of fence or cable would be installed from the road entrance to the existing gate along the north side of the service road to block trespassers from accessing the staging area.

Substation crews, construction equipment, and materials associated with the Weed Substation modifications would be staged on the Weed Substation property.

2.7.1.2 Work Areas

Work areas would be required at each pole site to facilitate the safe operation of equipment and construction operations. The size of these work areas would be dictated by the need to lay down the poles, install the necessary hardware, and frame the poles to their full length (generally 65 to 75 feet).

Tangent structure work areas would generally be 5,000 square feet (100 feet x 50 feet). Angle/dead end structure work areas would generally be 5,400 square feet (100 feet x 50 feet plus 20 feet x 20 feet for guy wires). Most work areas would not require any site preparation to allow work to occur. Site preparation (temporary disturbance) would occur at three tangent structure work areas for construction of the Proposed Project (Poles 18/48, 19/48, and 2/49X) and approximately six for the Weed Segment (between Poles 4/46 to 11/46). Site preparation (temporary disturbance) would occur at two angle/dead end structure work areas for construction of the Proposed Project (Poles 1/49, and 3/49X) and two for the Weed Segment (Poles 13X1/46 and 13X2/46). Vegetation in these disturbed areas would be cleared only to the extent necessary to allow for equipment to maneuver safely.

Grading[1] would occur where the topography is too steep or uneven to allow safe operation of equipment. After line construction, all work areas would be restored (see Section 2.7.1.9, Cleanup and Post-Construction Restoration). For the Proposed Project, it is anticipated that no grading would be required for preparation of tangent structure work areas. For the Weed Segment, it is anticipated that two (Poles 9/46 and 10/46) of the six tangent structure work areas that require site preparation would need to be graded as well. None of the angle/dead end work areas are expected to require grading.

Hill side construction would occur in areas that would require establishing a leveled trail to access the structure location as well as a pad or leveled area to allow for equipment set-up for installation of the poles. Typically, the blading[2] for the trail would not exceed 12 feet in width, depending on the hill slope. The blading for the pad would be done along the same area as the access road to reduce the overall amount of blading required for crane set-up, and would not typically exceed 1,200 square feet (30 by 40 feet) at the structure. No side hill construction areas are anticipated to be required for construction of the Proposed Project; however, approximately five side hill construction areas are anticipated for the Weed Segment (between Poles 4/46 to 11/46).

2.7.1.3 Pull and Tension Sites

In order to install a length of conductor, a pull site is needed at one end (to pull the new conductor) and a tension site is needed at the other (to hold tension on the new conductor as it is pulled). The distance between the pull and tension sites would be 11,750 feet or less. Pulling and tensioning sites would result in a temporary disturbance of 12,500 square feet (50 feet by 250 feet) with an estimated seven sites required for the Proposed Project (i.e., two at Pole 8/45, two at Pole 14/48, two at Pole 1/49 and one at the Weed Junction Substation) and two for the Weed Segment (one at Pole 8/45 and one at the Weed Substation), as shown on Figure 2-4 (a) through Figure 2-4(d). For mid-span setups, work areas would be located within the 50-foot right-of-way and up to 150 feet in length. Where feasible, all pull and tension areas were selected to allow access of equipment from roads and trails without requiring travel over long distances on the

1 Grading is defined as “to level or smooth to a desired or horizontal gradient”. Grading for the Proposed Project would be done in accordance with applicable city and/or county regulations.

2 Blading is defined as “removal of vegetation and rock with a straight blade bulldozer”.

ROW, and were located to be in relatively level areas so that blading would not be required. Equipment required at the pull sites would include two pullers and a pickup truck. Tension sites would require a tensioner, a pickup truck, and two or three drum pullers. Removal of the old conductor also would be carried out in the pull and tension sites.

2.7.1.4 Access Roads

Construction crews would primarily use existing roads and trails, which generally are used for maintenance and patrol of the existing line, along the upgrade portion of the project to access pole sites; these include paved roads and farm roads. Overland access in the right-of-way would be utilized where feasible to minimize the construction of new roads.

New permanent access roads, where required, would be approximately 12 feet wide. In areas where hill side slopes are significant, these roads would be bladed relatively flat. Additionally, in areas that are covered with rock that cannot be driven around, rock blading would be required to establish a level trail for maintenance of the structures. Blading would be done only to the extent required and necessary to access the transmission structures with construction vehicles and equipment. Although the exact locations that would require blading have not been identified, for the purposes of this analysis, it is assumed that all permanent access roads would be bladed. Table 2-2 below provides a summary of the different types of access roads, the type of preparation that would be required, and the estimated disturbed area.

TABLE 2-2
SUMMARY OF ACCESS ROAD REQUIREMENTS

Type of Road	Description	Area[a] Proposed Project	Area[a] Weed Segment
Existing	Typically double track. May have been graded at previously No other preparation required although a few sections may need to be re-graded and crushed rock applied in very limited areas for traction.	2.09 acres	2.44 acres
New Permanent	Would be 12 feet wide, bladed. No other preparation required although crushed rock may need to be applied in very limited areas for traction.	None	0.06 acres
Overland Access	No preparation required. Typically grassy areas that are relatively flat. No restoration would be necessary.	3.30 acres	0.15 acres

[a] Based on typical road width of 12 feet.

2.7.1.5 Vegetation Clearance

Existing vegetation would be preserved to the maximum extent practicable during all phases of construction. Vegetation clearance for all work areas and access roads would be limited to only that necessary for the safe access and operation of equipment. Larger vegetation such as sage brush would need to be selectively removed to access some pole locations and at some pull and

tension sites. Brush clearing on an existing access road would be required for approximately 500 feet of the transmission line corridor near the Weed Junction Substation, causing approximately 5,225 square feet (i.e., 0.12 acres) of temporary disturbance. Additionally, approximately 12 trees including large cedars and pines would need to be removed within the last 500 feet of the transmission line corridor leading into the Weed Junction Substation, including approximately 4 trees on the north side of the substation and approximately 2 trees on the south side of the substation. Clearing of flammable fuels (i.e., vegetation) at least 10 feet in each direction around wood poles would be conducted as required under Public Resources Code Section 4292.

2.7.1.6 Pole Installation and Removal

Pole Removal

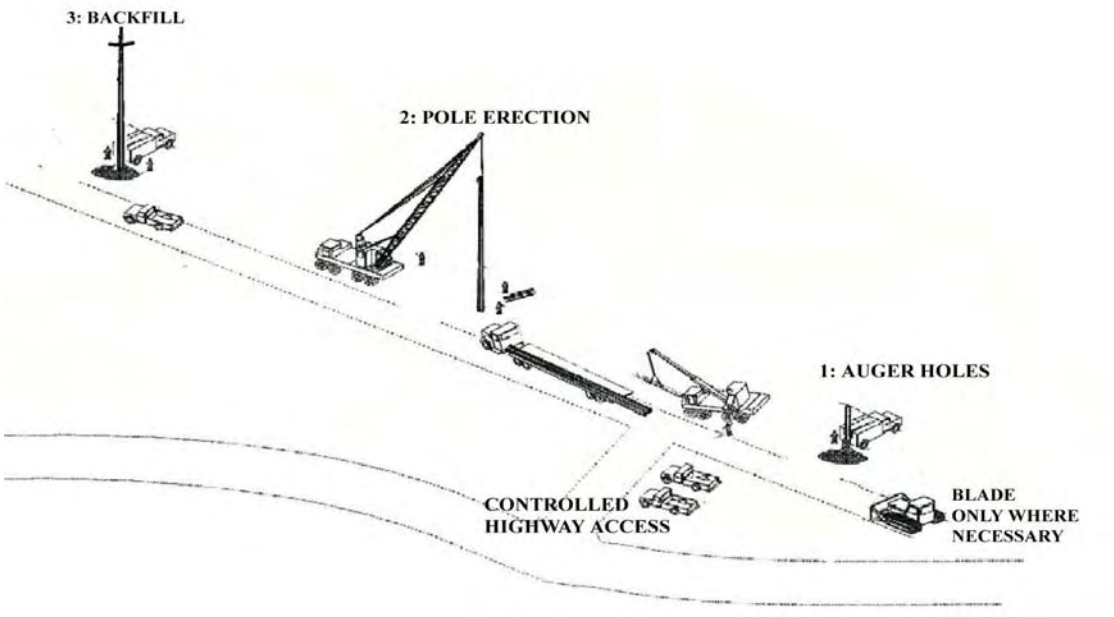
The poles would be removed by a line crew that would access each pole site with a line truck. The poles would be loosened by hydraulic jack then removed from their holes with a line truck, digger/derrick, or truck mounted crane. If the hole would not be reused, a backhoe and dump truck would backfill the hole with gravel. The top approximately 12 inches would be backfilled with soil removed from project-related construction activities (e.g., pole excavations) and stockpiled at the staging area. The surface would be restored with vegetation removed from the adjacent new pole hole or seeded with an appropriate seed mix.

Wood Pole Installation

Installation of the wood poles generally involves these steps: auguring or excavation of the pole holes, pole and insulator assembly, and installing the new pole, backfilling, and spreading any remaining soil on the work site (see Figure 2-7).

A pickup truck would be used to transport the crew, their hand tools, and other minor materials to and from pole locations. Equipment used to drill and excavate holes for the wood poles would include a power auger or drill, a bucket excavator, a crane and materials trucks (i.e., line truck and pickup truck). A power auger consists of an auger mounted on a heavy truck chassis or piece of track equipment and would be used to drill holes. A bucket excavator is a tracked backhoe which is used for the installed of down-guy anchors and assist in the removal of old poles. Any holes left open temporarily would be covered and/or fenced where practical to protect the public, livestock and wildlife. Soil removed from the holes would be stockpiled on the work area and used to backfill the holes. All remaining soil not needed for backfilling would be spread on the work area (see Section 2.7.1.9, Cleanup and Post-Construction Restoration).

The wood poles and associated hardware needed to assemble the poles would be delivered to each pole site by either a semi-tractor truck with a pole trailer (for loads of more than one pole) or a standard line truck with pole buggy (for single poles). Typically, insulator strings and stringing sheaves would be installed at each ground wire and conductor position while the pole is on the ground. Stringing sheaves are used to guide the conductor during the stringing process for attachment onto the insulator strings.



PacifiCorp's Yreka-Weed Transmission Line Upgrade Project. 205439

SOURCE: PacifiCorp (2005)

Figure 2-7
Typical Construction Sequence

After assembly, a crane or line truck would be used to hoist the wood pole into place. Table 2-3 shows a summary of pole installation and associated disturbance area estimates.

TABLE 2-3
SUMMARY OF TYPICAL POLE INSTALLATION METRICS

	Proposed Project 115 kV Single-circuit Transmission Line (approximate metrics)	Weed Segment 115 kV Double-circuit Transmission Line (approximate metrics)
Pole Diameter		
-Wood	24 inches	24 inches
-Self Supporting Steel	48 inches	48 inches
Auger Hole Depth		
-Wood	9 to 11 feet	9 to 12 feet
-Self Supporting Steel	20 to 25 feet	20 to 30 feet
Permanent Footprint per Pole		
-Wood	3.14 sq. feet	3.14 sq. feet
-Self Supporting Steel	12.56 sq. feet	12.56 sq. feet
Number of Poles		
-Wood	37	27
-Self Supporting Steel	4	4
Average Work Area around Pole (e.g., for old pole removal and new pole installation)		
- Tangent structure work areas	5,000 sq. feet	5,000 sq. feet
- Dead End/Angle structure work areas	5,400 sq. feet	5,400 sq. feet
Total Permanent Footprint for Poles	Approximately 0.004 acres	Approximately 0.003 acres

Steel Pole Installation

Direct Embed Steel Poles

Installation for direct embed steel poles would be similar to the installation of wood poles except a larger auger would be required for the larger diameter poles. Typical backfill material for direct embed steel poles would be ¾" crushed rock. Approximately 12 cubic yards of excavated materials would be hauled from each direct embed steel pole site. For biologically sensitive areas, excavated materials would be loaded directly into dump trucks for hauling or placed on tarps until they are hauled off site.

If soil conditions are not stable, a larger diameter hole may be required to accommodate the installation of a 6-foot diameter steel culvert. A larger boring rig and auger would be required to dig a 6-foot diameter hole. A boom truck would be required to lower the culvert into the hole. Backfill material around and inside the culvert would be comprised of ¾" crushed rock. Approximately 26 cubic yards of excavated materials would be hauled from each site requiring this method of installation.

In the event a high water table is encountered, the installation of a 6-foot diameter culvert would be required to stabilize the sides of the hole. The water would be pumped from the hole while the crushed rock backfill is installed. Depending the site conditions and the clarity of the water, the water could be pumped to a non-sensitive area or if required into a tanker truck for disposal.

Steel Pole with Concrete Foundation

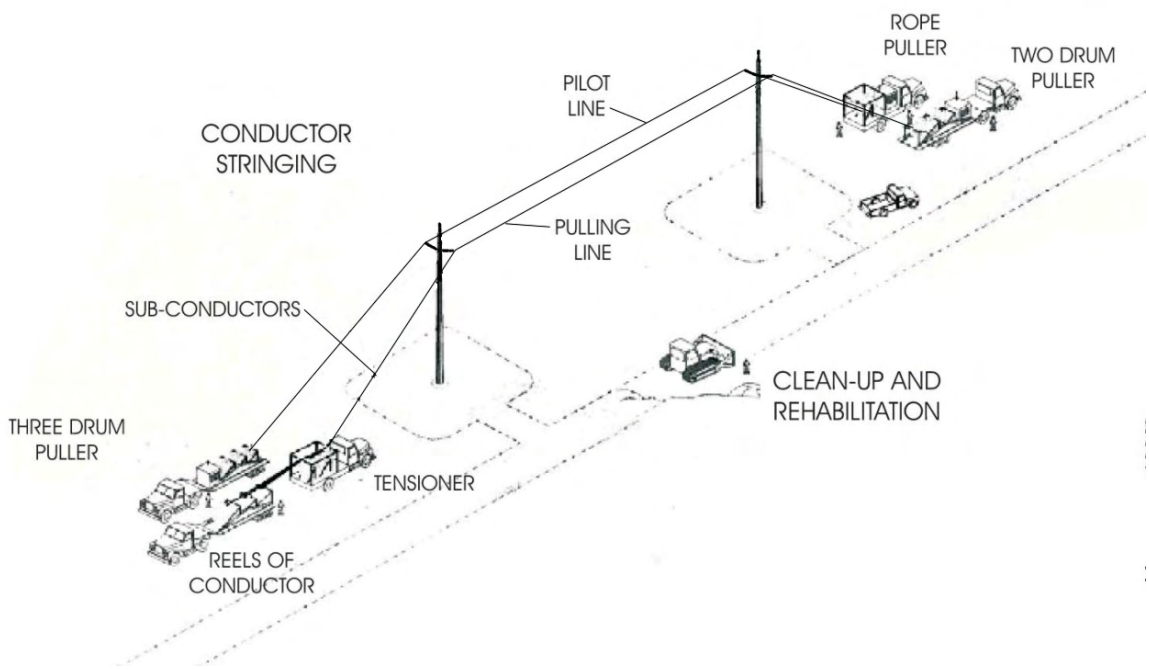
The foundation for Pole 8/45 would require excavation of a 6-foot diameter by 20-foot deep hole and placement of a circular steel culvert as described above for the direct embed method. However, at this location, the steel pole would be placed into the hole and the area inside the culvert would then be backfilled with concrete. Backfill material outside the culvert would be ¾" crushed rock. Approximately 26 cubic yards of excavated materials would be hauled from the site.

2.7.1.7 Conductor Installation

Once the new poles are installed, the existing conductor would be used to pull pilot (pulling) line from pole to pole using the stringing sheaves on each pole. The pilot line would be used to pull the new conductor and ground wire into place. Once the new conductors are pulled into place they would be attached to the insulators and the pulling sheaves removed. This process would be repeated until the ground wire and conductor is pulled through all sheaves. Figure 2-8 shows typical conductor stringing activities.

Conductor splicing would be required at the end of a conductor spool or if a conductor is damaged during stringing. The work would occur in work areas designated for the pole assembly/installation or within the pull and tension sites.

The conductor would be strung using powered pulling equipment at one end and powered braking or tensioning equipment at the other end. For the crossing of Hoy Road, safety measures such as barriers, flagmen, or other traffic control would be used for public protection during wire installation.



PacifiCorp's Yreka-Weed Transmission Line Upgrade Project. 205439

SOURCE: PacifiCorp (2005)

Figure 2-8
Typical Conductor Stringing Activity

2.7.1.8 Erosion and Sediment Control and Pollution Prevention During Construction

Erosion and sediment controls may be necessary to prevent soil erosion in construction areas located on hill sides where a leveled trail to access a structure location or a leveled area would be required to allow equipment set-up for pole installation. An erosion and sediment control plan using best management practices would be developed prior to construction. The goal of the erosion and sediment control plan would be to manage sediment from surface runoff before the runoff would be discharged from the project site. This would be accomplished by:

- Minimizing the acreage of disturbed and exposed soil during the construction phase and implementing stabilization measures where necessary.
- Manage sediment in runoff before it leaves the site.
- Complying with specific erosion and sediment control measures identified within the erosion and sediment control plan.

Best management practices for controlling erosion and sedimentation may include straw wattles, straw bale barriers and silt fencing placed at construction boundaries. Gravel ramps could be installed at access points to public roadways, if necessary, to prevent or minimize the tracking of mud, dirt, sediment, or similar materials onto the roadway.

Erosion control structures such as water bars, diversion channels, terraces and slope roughening may be constructed, if necessary, to divert water and reduce soil erosion along the right-of-way, or other areas disturbed by construction where slopes exceed 30%. Selection of appropriate erosion control materials would be based on soil properties, steepness of the slope, and anticipated surface flow or runoff.

Existing vegetation would be preserved to the maximum extent practicable during all phases of construction. Vegetation clearing would be kept to a minimum and would occur only where necessary for safe operation of equipment and as required by the Public Resources Code.

All disturbed areas would be re-seeded using a seed mix acceptable to the Siskiyou County Department of Agriculture and best management practices for erosion control. On slopes greater than 30%, additional measures such as organic fiber mulching, geo-textile fabrics, and sod mats would be used.

Diesel fuel, gasoline, oil and other lubricants as well as adhesives and sealants would be utilized during the construction of the transmission line. Bulk quantities would be stored in designated construction yards/staging areas. Vehicle fueling and maintenance activities would be restricted to staging areas or approved areas away from surface waters and sensitive habitats. All construction vehicles would be monitored for leaks and receive regular off-site preventive maintenance to reduce the chance of leakage.

Construction Waste Disposal

Construction sites, material storage yards, and access roads would be kept in an orderly condition throughout the construction period. Refuse and trash would be removed from the sites and disposed in an approved manner. Oils, fuels and chemicals used in connection with the project will be managed and disposed of properly, including by disposal in an approved site as appropriate. No open burning of construction refuse and trash would occur.

All forms of refuse and waste produced along the right-of-way during construction would be collected and disposed of in a designated landfill or appropriate waste disposal site. Refuse and waste is defined as any discarded material, trash, garbage, packing material, containers, waste petroleum products, broken equipment, used parts, excess construction materials.

2.7.1.9 Cleanup and Post-Construction Restoration

Disturbed areas within the right-of-way would be graded and reseeded. The natural drainage pattern along the right-of-way would be restored as near as possible to the original pattern. The reclamation would be accomplished using a truck (for hauling equipment and tools), motor grader (for restoring the grade), pickup truck (for hauling workers and hand tools), and a water truck (for dust control).

Work sites, including the staging area, would be restored using excess materials, vegetation and topsoil stockpiled from the site preparation activities. The contractor would dispose of excess soil materials, rock, and other objectionable materials that could not be used in restoration work.

Disturbed areas, with the exception of access roads, would be restored, as nearly as possible, to their original contour and pre-Project condition, and reseeded where appropriate. Ripping and other surface scarification on construction roads or other areas would be done as necessary. In some cases the limited amount of soil compaction and vegetation destruction may not warrant ripping and reclamation.

2.7.2 Substation Modifications and Construction

Construction at the Weed Substation would be performed entirely on PacifiCorp property. Materials and equipment would be stored on PacifiCorp property. The substation work crew would use a mobile office and tool van, which would be located on the substation property. Traffic control would be provided if necessary, but is not anticipated.

For installation of the temporary substation, an area approximately 50 feet by 50 feet would be excavated to an average depth of 12 inches resulting in approximately 100 cubic yards of excavated soil that would be stockpiled on site. Typical fill for the site would be approximately nine inches of base rock (three to six inches) covered by ¾- to 1-inch rock with fines. The rock would be compacted with a roller and/or vibrator. Once the site is prepared, the temporary substation would be placed on wood cribbing. A temporary fence would also be installed around the temporary substation equipment. This fence and gate would be constructed using the same specifications for the permanent substation fence.

A 12-inch earthen berm would also be installed along two or three sides of the substation to contain any potential oil spills from the transformer and a temporary grounding system of buried copper wire and ground rods would be installed for grounding protection.

Once the new Weed Substation has been constructed, the temporary substation fence, grounding system, and wood cribbing would be removed and hauled from the site. The transformer and other equipment would be removed and hauled to PacifiCorp's Medford Service Center for storage.

Restoration of the temporary substation site would include blending, spreading and contouring of the stockpiled soil and imported rock into the new landscaping. This material would then be covered with landscaping bark or mulch.

2.7.3 Construction Workforce and Equipment

Project construction would require several specific work crews. Including both PacifiCorp and contracted construction personnel, the total number of construction crew members for the Proposed Project and Weed Segment is roughly estimated to be 30 to 35 crew members, each. It is expected that construction crews would work concurrently; however, the actual deployment of

crews depends upon the timing of project approval and other factors. PacifiCorp expects that various crews may be operating at the same time at different locations. Table 2-4 provides a detailed description of these various construction crews and identifies the equipment that each would utilize for construction. Table 2-5 describes the general purpose(s) of the equipment expected to be used during project construction.

2.7.4 Construction Schedule

Table 2-6 provides a summary of the proposed construction schedule for the Proposed Project and Weed Segment. The total construction duration is expected to be approximately one month for the Proposed Project, which may occur at any time within a four-month window depending on weather. The total construction duration is expected to be approximately eight months for the Weed Segment, also depending on weather.

2.8 Operation and Maintenance

2.8.1 General System Monitoring and Control

PacifiCorp uses industry standard monitoring and protection equipment on its transmission system, which would include the Proposed Project. The transmission line would be protected with power circuit breakers and related line relay protection equipment. If conductor failure were to occur, then power automatically would be removed from the line.

2.8.2 Facility Inspection and Maintenance Procedures

The 115 kV transmission line would be inspected on a yearly basis by an area line patrolman driving a pick-up or an all terrain vehicle as access conditions allow. Maintenance would be performed regularly and otherwise as needed. When access would be required for non-emergency maintenance and repairs, the maintenance crews would minimize environmental impacts by performing maintenance during the dry season when possible, using existing roads, using all terrain vehicles with flotation tires when it is not practical to stay on existing roads, or inspecting poles on foot.

Emergency maintenance would involve prompt movement of repair crews to repair or replace any damage. Crews would be instructed to protect crops, plants, wildlife, and other environmental resources to the maximum extent feasible under the exigency of the circumstances. Restoration procedures following completion of repair work would be similar to those described in Section 2.7.1.9, Cleanup and Post-Construction Restoration.

TABLE 2-4
TRANSMISSION LINE CONSTRUCTION
ESTIMATED PERSONNEL AND EQUIPMENT

Activity	People	Quantity of Equipment
Survey	3	1 pickup truck
Access Road Construction	2 to 3	1 bulldozer (D-8 Cat) 1 motor grader 1 pickup truck 1 water truck (for construction)
Auger Holes, Direct Embed Poles	5	1 hole digger 1 backhoe or bucket excavator 1 water truck 1 pickup truck 1 line truck
Material Haul	3	1 tractor/trailer 2 yard and field cranes or line trucks 1 fork lift
Structure Assembly, Per Crew 2 Crews Required	4	1 pickup truck 1 truck (2 ton)
Structure Erection, Per crew 2 Crews Required (includes old pole removal)	4	1 truck (2 ton) 1 pickup truck 1 bucket truck 1 line truck
Wire Installation (includes old conductor removal)	8	1 wire reel trailer 1 diesel tractor 1 crane 1 line truck 3 pickup trucks 2 bucket trucks 2 3-drum pullers 1 single drum puller (large) 1 double bull-wheel tensioned (heavy)
Right-of-Way Restoration and Cleanup	4	1 truck 1 motor grader 1 pickup truck 1 water truck

NOTE: Maximum total personnel required considering all tasks is 30 to 35 persons (actual personnel at any one time would be less)

SOURCE: PacifiCorp (2005)

TABLE 2-5
GENERAL PURPOSE FOR THE EQUIPMENT EXPECTED TO BE USED DURING PROJECT CONSTRUCTION

Type of Equipment	Use
• Bucket Truck (i.e. Cherry Picker)	• Lift and transport workers
• Crane	• Erect pole structures, lift and transport heavy construction items
• Backhoe or Bucket Excavator	• Transport personnel, tools, and materials
• Crew-Cab Truck/Pick-Ups	• Pull pole trailer for multi-pole loads
• Diesel Tractor	• Haul material
• Dump Truck	• Lift and transport heavy construction items
• Fork Lift	• Road construction (staging, pull sites) – move/compact soils – compaction and dust control – to properly pitch road for run-off
• Grooming/Grading Equipment: – dozer – water truck – motor grader	• Excavate holes
• Hole Auger/Truck Auger	• Haul conductor, poles, equipment, materials, and people, and to install pole/conductor
• Line Truck and Trailer	• Supervision and clerical office
• Mobile Offices	• Install conductor
• Pullers, Reel Dolly	• Install and move conductor
• Tensioned	• Haul materials, equipment, tools, etc.
• Tractor/Trailer	• Haul materials
• Two-Ton Truck	• Transport reels of conductor
• Static Wire Reel Trailer	

SOURCE: PacifiCorp (2005)

TABLE 2-6
PROPOSED CONSTRUCTION SCHEDULE

Project Activity	Proposed Project	Weed Segment
Permit To Construct decision adopted and effective	October 2007	October 2007
Acquisition of required permits	August 2006 – April 2007	February 2006 – October 2007
Right-of-way / property acquisition	November 2006 – January 2008	August 2007 – October 2007
Final engineering completed	December 2007	September 2007
Construction begins	February 2008	November 2007
Transmission line construction	February 2008 – May 2008	February 2008 – May 2008
Temporary Substation Construction	N/A	November 2007 – December 2007
Substation construction	N/A	November 2007 – May 2008
Project operational	June 1, 2008	June 1, 2008
Clean up	May – August 2008	May – September 2008

2.9 Electric and Magnetic Fields Summary

2.9.1 Electric and Magnetic Fields

This EIR does not consider electric and magnetic fields (EMF) in the context of the CEQA analysis of potential environmental impacts because [1] there is no agreement among scientists that EMF creates a potential health risk, and [2] there are no defined or adopted CEQA standards for defining health risk from EMF. However, recognizing that there is a great deal of public interest and concern regarding potential health effects from human exposure to EMF from transmission lines, this document does provide information regarding EMF associated with electric utility facilities and human health and safety. Thus, the EMF information in this EIR is presented for the benefit of the public and decision makers.

Potential health effects from exposure to *electric fields* from transmission lines (i.e., the effect produced by the existence of an electric charge, such as an electron, ion, or proton, in the volume of space or medium that surrounds it) typically do not present a human health risk since electric fields are effectively shielded by materials such as trees, walls, etc. Therefore, the majority of the following information related to EMF focuses primarily on exposure to *magnetic fields* (i.e., the invisible fields created by moving charges) from transmission lines. Additional information on electric and magnetic fields generated by transmission lines is presented in Appendix D.

After several decades of study regarding potential public health risks from exposure to power line EMF, research results remains inconclusive. Several national and international panels have conducted reviews of data from multiple studies and state that there is not sufficient evidence to conclude that EMF causes cancer. Most recently the International Agency for Research on Cancer (IARC) and the California Department of Health Services (DHS) both classified EMF as a *possible* carcinogen.

Presently, there are no applicable federal, State or local regulations related to EMF levels from power lines or related facilities, such as substations. However, the California Public Utilities Commission has implemented a decision (D.06-01-042) requiring utilities to incorporate “low-cost” or “no-cost” measures for managing EMF from power lines up to approximately 4% of total project cost. Using the 4 percent benchmark, PacifiCorp has incorporated low-cost and no-cost measures to reduce magnetic field levels along the transmission corridor.

2.9.2 EMF and the Proposed Project

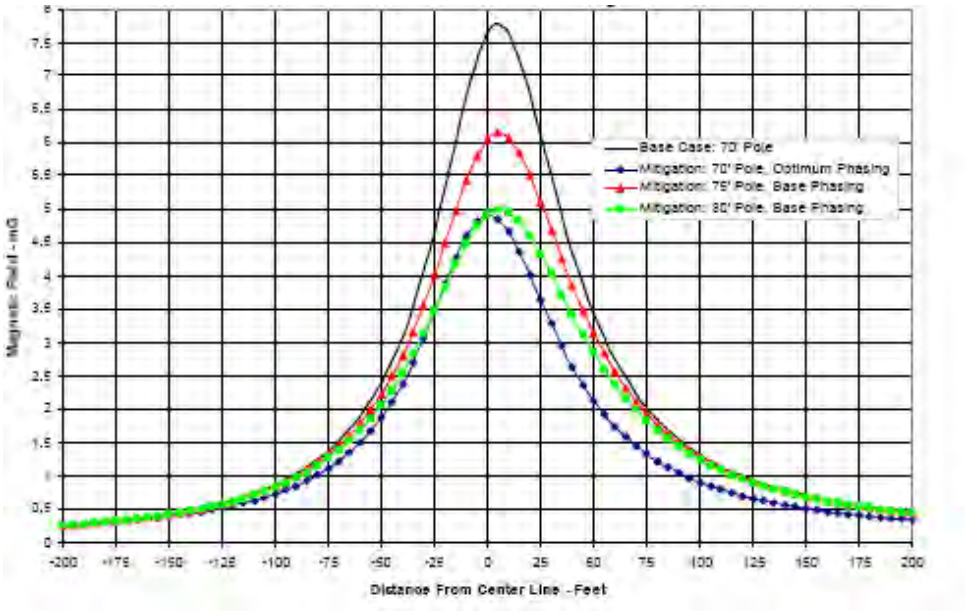
PacifiCorp has prepared an EMF Plan that provides EMF information regarding the Proposed Project and Weed Segment (see Appendix D). The Plans includes a brief introduction to EMF characteristics, scientific research related to possible health effects, and public policy activities. In addition, the Plans identify PacifiCorp’s guidelines and general methods for managing EMF for new electrical facilities.

Consistent with PacifiCorp’s Electro Magnetic Fields, California Design Guidelines, modeling has been provided for the Proposed Project and Weed Segment delineating the magnetic field

levels for both the existing power lines and the proposed transmission line as well as the Weed Substation. As part of the Proposed Project and Weed Segment, PacifiCorp would incorporate "no cost" and "low cost" magnetic field reduction steps. The specific measures proposed by PacifiCorp to reduce magnetic field exposure are:

- Optimum phasing would be used wherever there is distribution underbuild (this is a total of approximately 40% of the upgraded and new transmission line for the Proposed Project);
- The three poles that do not have distribution underbuild but are in an agricultural land use area would be raised 5 feet (from the base case pole height of 70 feet);
- No mitigation would be applied to poles without distribution underbuild in land use areas that are designated as unpopulated or forested;
- No mitigation would be applied to the Weed Segment since the upgrade from a single-circuit 69 kV transmission line to a double-circuit 115 kV transmission line reduces the EMF by more than 15%.
- No mitigation would be applied to the Weed Substation rebuild since the main source of EMF is from the transmission lines surrounding the substation.

Figure 2-9 shows EMF levels for the Proposed Project overhead transmission line with and without EMF reduction measures.



PacifiCorp's Yreka-Weed Transmission Line Upgrade Project. 205439

SOURCE: PacifiCorp (2007)

Figure 2-9

Estimated EMF Levels with and without EMF Reduction Measures

References – Project Description

PacifiCorp, 2005. *Proponent's Environmental Assessment for the Yreka / Weed Transmission Line Upgrade Project*, November 2005.

PacifiCorp, 2007. *Proponent's Environmental Assessment for the Weed Segment Project*, January 2007.