4 PROJECT DESCRIPTION

4.1 Introduction

On November 2, 2015, PacifiCorp (the applicant ~~Applicant~~) filed an application (A.15-11-005) that included a proponent's environmental assessment (PEA; PacifiCorp 2015) pursuant to Rules 2.4 and 2.5 of the California Public Utilities Commission's (CPUC) Rule of Practice and Procedure with the CPUC for a Permit to Construct for the Lassen Substation Project (proposed project).

The proposed project is located in the City of Mount Shasta (City) and in unincorporated Siskiyou County (Figure 4-1, Regional Location and Vicinity), and consists of a new 69 kilovolt (kV) to 12.47 kV substation to replace the existing Mount Shasta Substation, upgrades to the existing 69 kV transmission line that supplies the substation, and upgrades to the distribution system supplying the City of Mount Shasta.

4.2 Project Objectives

According to PacifiCorp, the primary objectives of the proposed project are as follows:

- Ensure that all equipment and structures comply with current company, state, and federal standards,[1] including the replacement of aging and non-standard equipment and the removal of sulfur hexafluoride (SF_6) distribution breakers.
- Ensure a reliable ongoing electricity supply to the area currently served by the Mount Shasta Substation.
- Facilitate regional bulk transmission voltage stability and improve bulk power transfer across the region.

The current Mount Shasta Substation was constructed in 1930 and is coming to the end of its serviceable life. The wooden support structure is deteriorating and much of the equipment is obsolete. During the most recent service, several components were custom made because they are no longer manufactured; this reduces long-term system reliability (PacifiCorp 2016a). Additionally, current distribution circuit breakers are a mix of vacuum interrupters and SF_6 breakers. SF_6 is a highly reactive greenhouse gas that is subject to regulation as part of greenhouse gas emission reduction targets (17 CCR 95350 et seq.), and PacifiCorp no longer uses SF_6 based breakers in their distribution systems. Finally, issues with the distribution lines require their replacement and relocation. When Interstate 5 (I-5) was constructed, the 4.16 kV

[1] PacifiCorp 2016a, DR 2.0 – Response 2.0 a.

distribution lines that serve the City of Mount Shasta were routed under I-5 through California Department of Transportation (Caltrans) culverts. Running distribution lines in culverts is a non-standard routing method for which Caltrans granted an extension in 2000 with the condition that the lines be removed by 2005. Since then Caltrans and PacifiCorp have been developing a more permanent solution (PacifiCorp 2015).

The anticipated near-term load growth in the Mount Shasta service area is likely to use the remaining available capacity on the existing transmission lines, and exceed the capacity of existing transformers. Because other local substations, such as Weed Junction and North Dunsmuir, are too distant, being 10 miles and 6 miles away respectively, upgrading the line and transformers serving the Mount Shasta service area is necessary to maintain reliable service.

The current bulk power transmission system in northern California is constrained by the voltage stability regulation. To facilitate stability and bulk power transfer across the regional system, PacifiCorp plans to remove local service areas from the regional bulk transmission system. To help achieve this, PacifiCorp needs to provide a second 115 kV line to the North Dunsmuir Substation. Consequently, PacifiCorp proposes to construct the project with the capability of running at 115 kV, although it would initially run at 69 kV. This would continue to allow PacifiCorp to use Line 14 (the other 115 kV transmission line in the region) as a dedicated Western Electricity Coordinating Council (WECC) transmission path to carry scheduled power flow.

4.3 Project Location

The proposed project is located in the City of Mount Shasta and in unincorporated Siskiyou County (Figure 4-1). The new Lassen Substation would be located on two parcels (APN 036-220-280 and APN 036-220-170) adjacent to the existing Mount Shasta Substation on South Old Stage Road, approximately 0.67 miles to the southwest of the City, and about 900 feet west of I-5 (Figure 4-2, Project Component Overview) in unincorporated Siskiyou County. Transmission and distribution line upgrades, including pole replacements, would take place predominantly in existing rights-of-way on the western side of I-5, as shown in Figure 4-3, Lassen Substation and Transmission Components, and Figure 4-4, Distribution System Components.

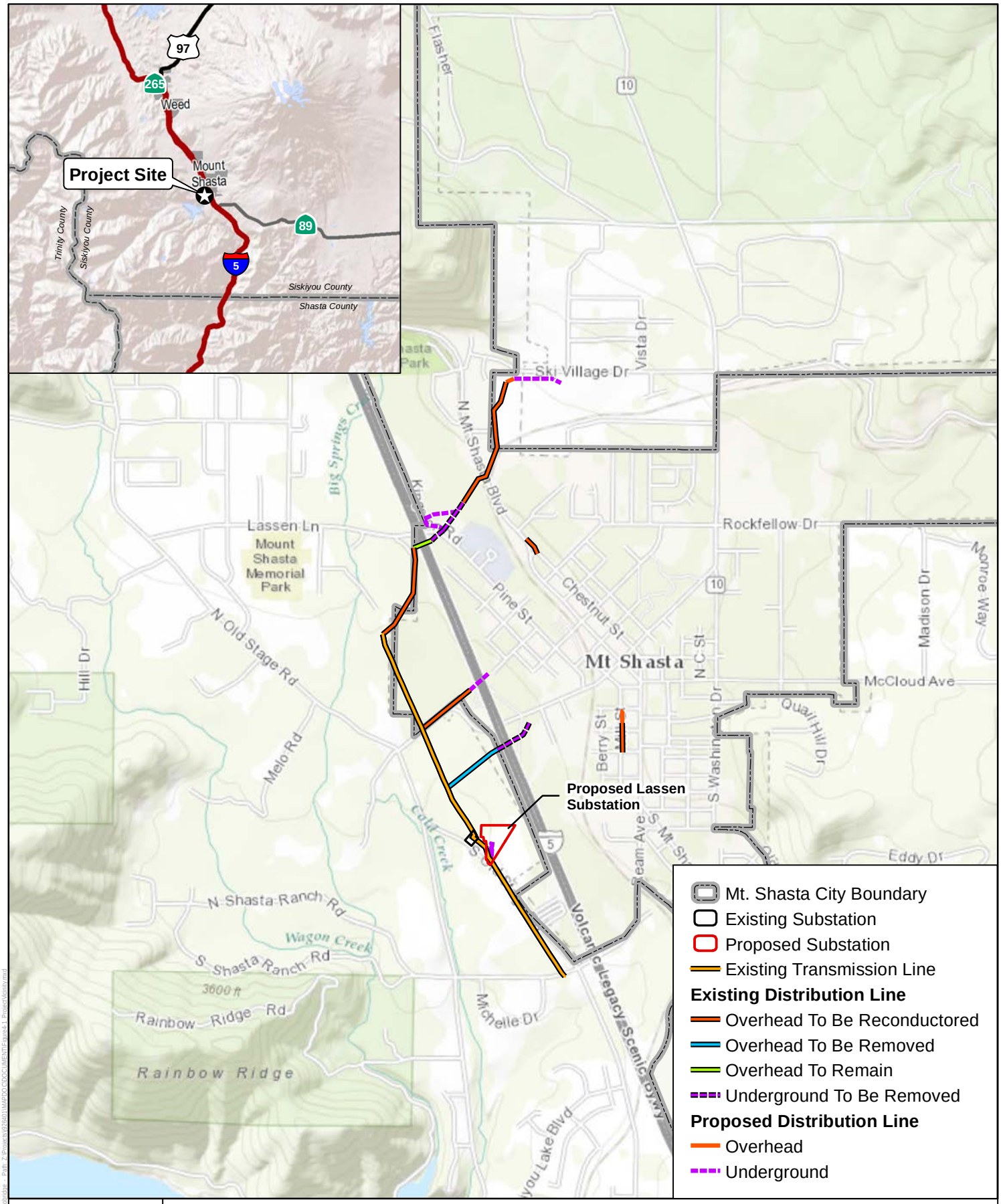

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FIGURE 4-1

Regional Location and Vicinity

Lassen Substation Project

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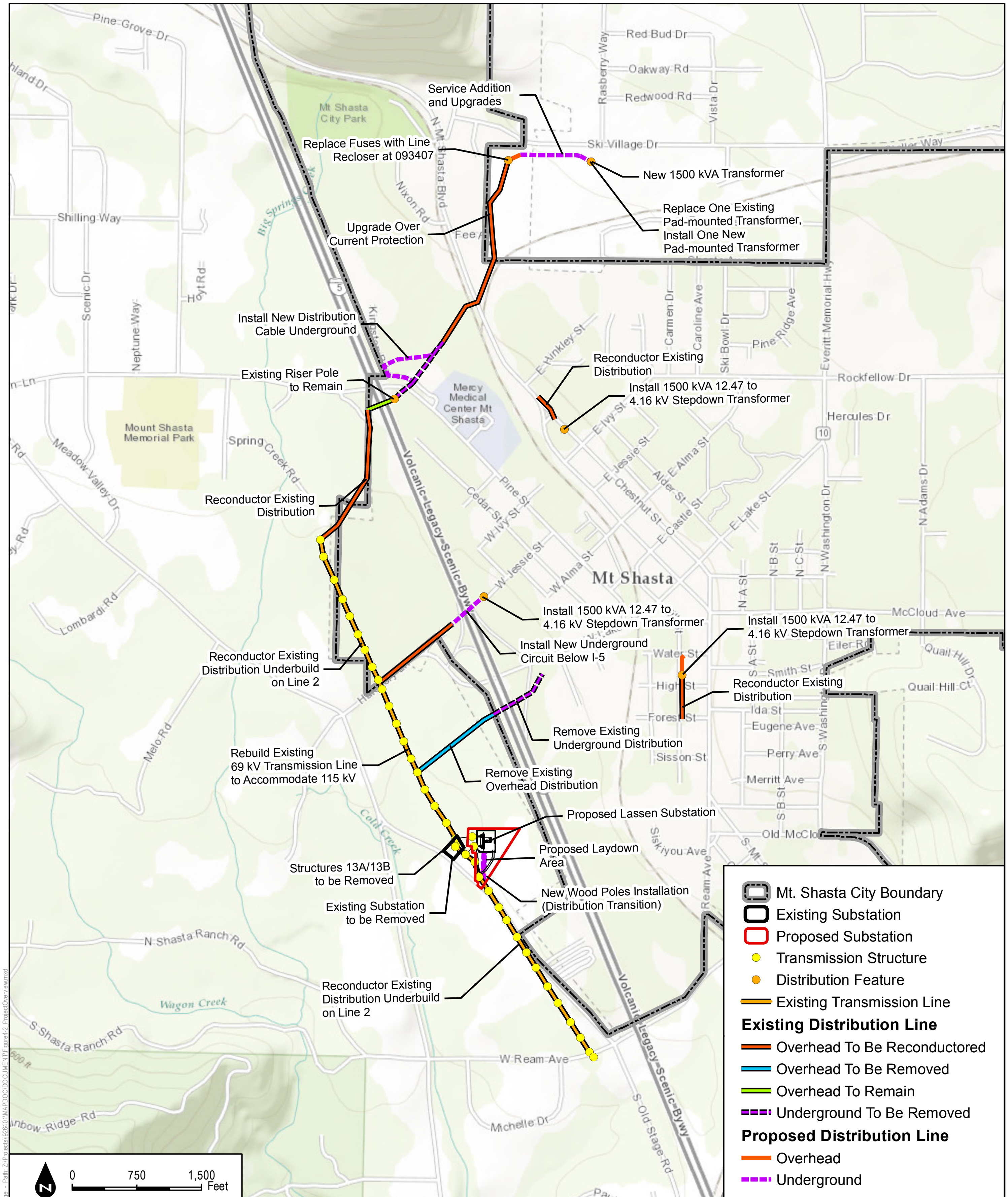
Service Addition and Upgrades
Replace Fuses with Line Recloser at 093407
New 1500 kVA Transformer
Replace One Existing Pad-mounted Transformer, Install One New Pad-mounted Transformer
Upgrade Over Current Protection
Install New Distribution Cable Underground
Existing Riser Pole to Remain
Reconductor Existing Distribution
Install 1500 kVA 12.47 to 4.16 kV Stepdown Transformer
Reconductor Existing Distribution
Install 1500 kVA 12.47 to 4.16 kV Stepdown Transformer
Install New Underground Circuit Below I-5
Install 1500 kVA 12.47 to 4.16 kV Stepdown Transformer
Reconductor Existing Distribution
Reconductor Existing Distribution Underbuild on Line 2
Remove Existing Underground Distribution
Rebuild Existing 69 kV Transmission Line to Accommodate 115 kV
Remove Existing Overhead Distribution
Proposed Lassen Substation
Proposed Laydown Area
Structures 13A/13B to be Removed
New Wood Poles Installation (Distribution Transition)
Existing Substation to be Removed
Reconductor Existing Distribution Underbuild on Line 2
Mt Shasta
Mt Shasta City Park
Mount Shasta Memorial Park
Mercy Medical Center Mt Shasta
Volcanic Legacy Scenic Byway
Mt. Shasta City Boundary
Existing Substation
Proposed Substation
Transmission Structure
Distribution Feature
Existing Transmission Line
Existing Distribution Line
Overhead To Be Reconductored
Overhead To Be Removed
Overhead To Remain
Underground To Be Removed
Proposed Distribution Line
Overhead
Underground
0
750
1,500
Feet

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SOURCE: ESRI Basemaps (2016); PacifiCorp (2015)

FIGURE 4-2

Project Component Overview

Lassen Substation Project

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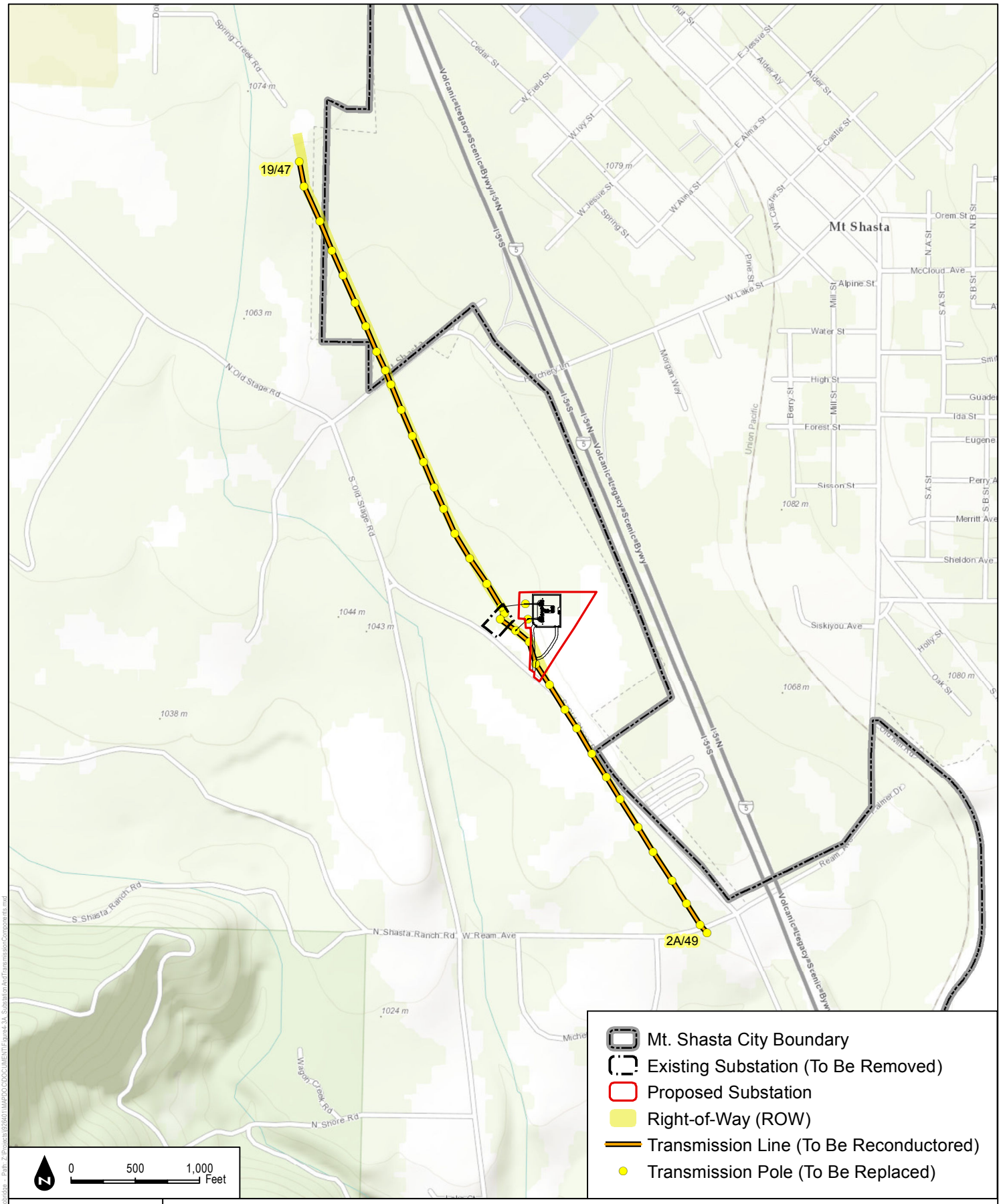

SOURCE: ESRI Basemaps (2016); PacifiCorp (2015)

FIGURE 4-3

Lassen Substation and Transmission Components

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Lassen Substation Project

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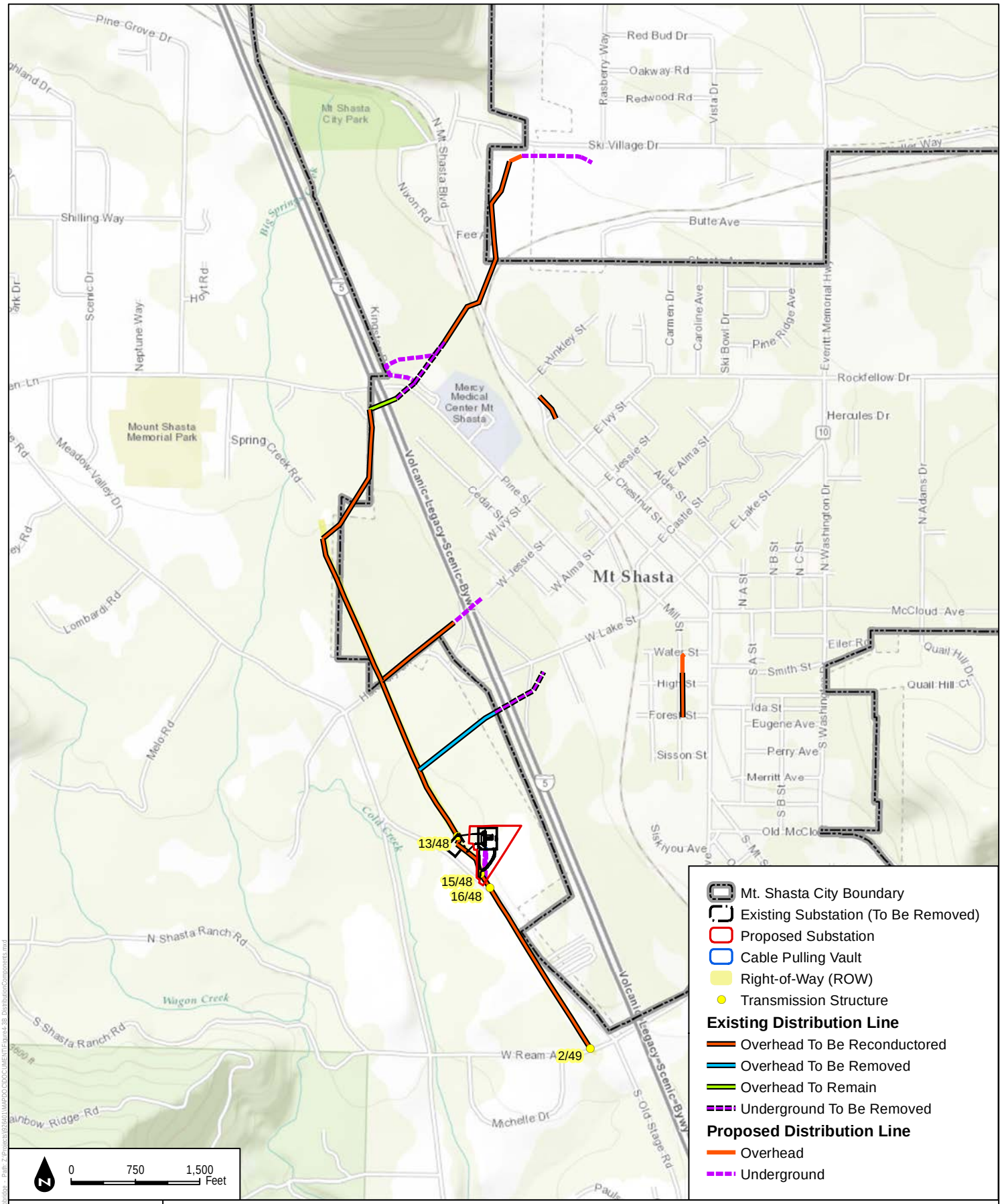

SOURCE: ESRI Basemaps (2016); PacifiCorp (2015)

FIGURE 4-4

Distribution System Components

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Lassen Substation Project

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Setting and Surroundings

The project area is located near the City of Mount Shasta, in Siskiyou County. The area is bounded by Mount Shasta to the northeast, Mount Eddy and the coastal ranges to the west, and Lake Siskiyou to the southwest.

The Lassen Substation would be located in a rural residential area to the southwest of the City. The proposed location for the substation is adjacent to the existing Mount Shasta Substation. The proposed project ~~and~~ would be constructed on two vacant residential properties that currently consist~~ing~~ of vacant dwellings and associated outbuildings surrounded by coniferous and ornamental trees.

Transmission and distribution system upgrades would occur both within the City and in rural open space to the west and north of the City and in unincorporated Siskiyou County. Vegetation communities under the existing transmission lines and in the surrounding project area include non-native grassland, dry and wet montane meadows, fen, riparian scrub, and fragmented lower montane coniferous forest. The area is predominantly rural residential and montane coniferous forest, with the open space under the transmission lines having been heavily grazed by cattle.

4.4 Project Elements

Existing transformers in the Mount Shasta Substation would be replaced with 12.47 kV transformers in the new Lassen Substation, which in turn would require the existing 4.16 kV distribution lines that currently supply the City to be upgraded to 12.47 kV distribution lines. To accommodate the additional weight of the new distribution lines and maintain compliance with Title 8 of the California Code of Regulations and CPUC General Order 95, 36 wooden poles along the existing 69 kV transmission line running to the northwest and southeast of the proposed substation would be replaced and the existing 69 kV transmission line would be transferred to the new poles (Figure 4-3).

Three new 12.47 kV distribution lines would be installed to supply the City in three locations. Two existing lines, Pioneer Feeder and Black Butte Feeder, would be underbuilt on Line 2 to Ream Avenue and West Lake Street, respectively. In addition, a new distribution line would also be installed and built under the rebuilt Line 2 running northwest from the substation, before using existing distribution rights-of-way to supply industrial facilities on Ski Village Drive. (Figure 4-4).

The upgrade to 12.47 kV would require three new 12.47 to 4.16 kV stepdown transformers to be installed in the City of Mount Shasta on Chestnut Street between East Ivey Street and East Field Street, on Mill Street between Forest Street and Water Street, and at the bottling plant on Ski Village Drive.

4.4.1 Substation

The proposed Lassen Substation would be constructed on two parcels adjacent to the existing Mount Shasta Substation on South Old Stage Road. Existing buildings and trees would be cleared prior to grading (Figure 4-5, Substation Plan View). The substation would then be built on a graded gravel pad measuring approximately 215 feet by 250 feet.

Below-grade components would include the grounding grid and drainage system, electrical conduits, and the distribution line vault. Reinforced concrete foundations would be installed to support heavier components, including the steel structures, transformers, and switching gear. The remaining pad would be filled, and graded with gravel. Grading groundwork and foundation installation would require the removal of up to 65,500 cubic feet of fill material from the site.

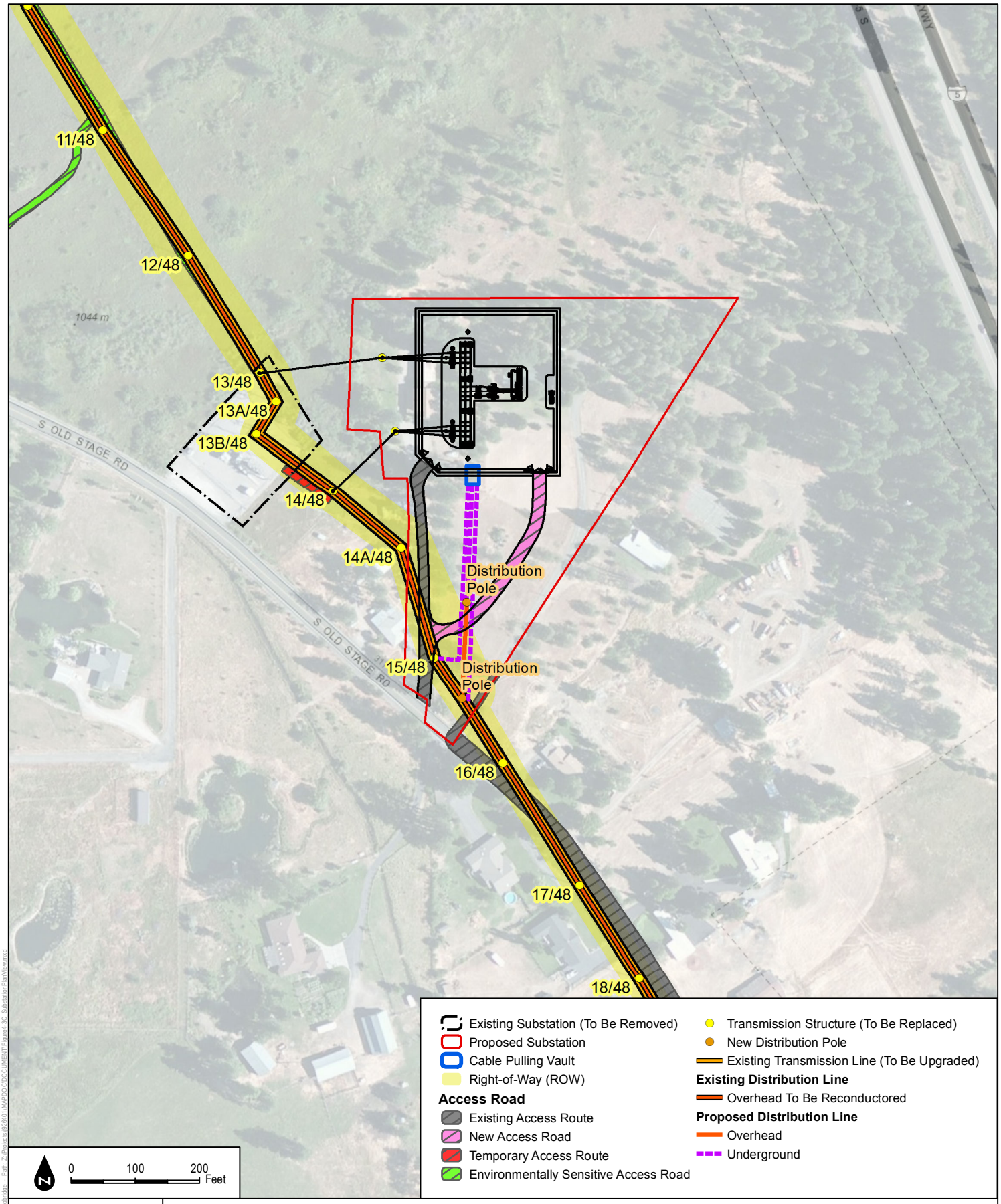
Aboveground structures would consist of control and relay houses, transformers (single 69/12.47 kV 15/20/25 megavolt amperes (MVA)), switchgear, and tubular steel supporting structures that would be in the configuration shown on Figure 4-5. Structures in the substation would be up to 40 feet in height, excluding transmission and distribution poles (Figure 4-6, Lassen Substation Plan and Elevation Views).

Fencing, Access Control, and Lighting

Perimeter security fencing would be installed around the substation yard and would consist of a 7-foot-tall chain-link security fence, strung with 1 foot of barbed wire on top. Ingress and egress would be through 20- to 24-foot-wide double chain-link gates, similar in construction to the surrounding chain-link fence.

Roadways Access

The existing residential driveway would be upgraded to gravel and an additional road would be constructed to provide a 20- to 24-foot-wide fire truck access loop through the substation that would connect back to the South Old Stage Road at the current access point to the parcel (Figure 4-5).



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SOURCE: ESRI Basemaps (2016); Bing Maps (2016); PacifiCorp (2015)

FIGURE 4-5

Substation Plan View

Lassen Substation Project

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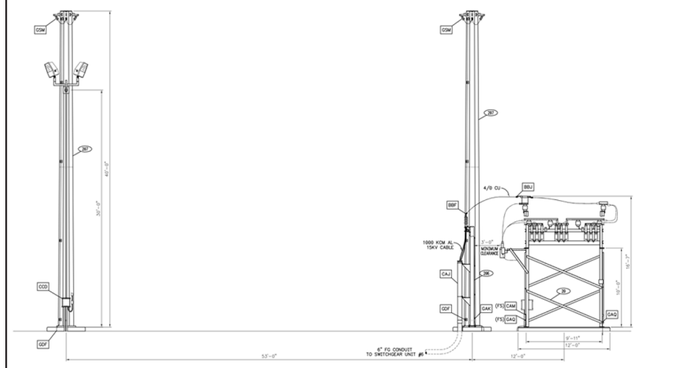
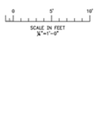
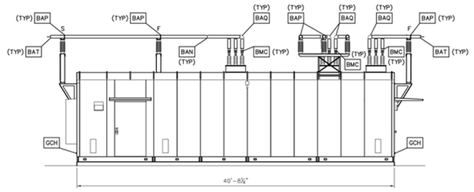


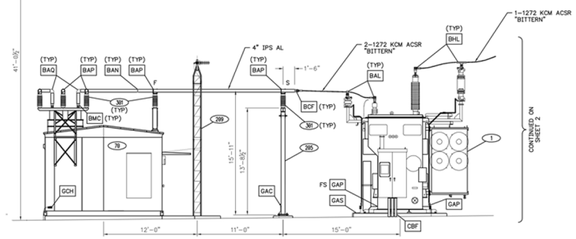
ELEVATION 6–6



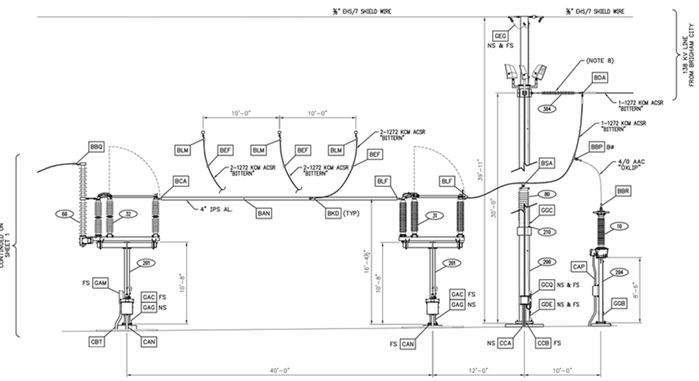
SECTION A–A



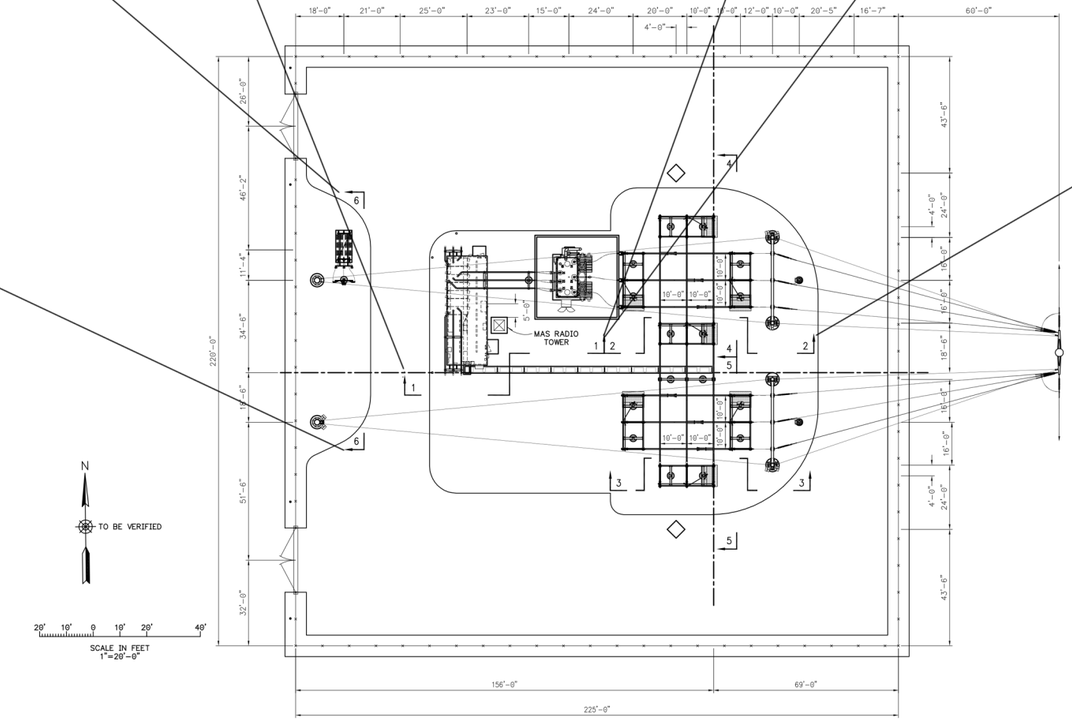
SECTION A–A



ELEVATION 1–1



ELEVATION 2–2



SOURCE: PacifiCorp 2016.

FIGURE 4-6
Lassen Substation Plan and Elevation Views

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Lassen Substation Project

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Transmission Line Connection

Two new guyed wooden poles would be erected to connect the proposed Lassen Substation to the existing Line 2 69 kV transmission line. The poles would be located 30–50 feet to the west of the fenced boundary of the substation (Figure 4-5). The new guyed wooden poles would be between 80 and 90 feet tall and approximately 19 inches in diameter. When the transmission line is looped in and the substation activated, the two existing poles that feed the Mount Shasta Substation would be removed as part of the Mount Shasta Substation demolition.

Distribution Line Connection

Three new distribution lines would run underground from the substation vault located on the southern side of the substation compound to connect to poles in the main 69 kV transmission alignment adjacent to South Stage Road.

The first Black Butte Feeder distribution line would run underground from the substation vault south to Pole 15/48. The second distribution line would run to a new riser pole adjacent to the new access road before going overhead to a new wooden distribution pole between Poles 15/48 and 16/48. The third distribution line would run to the same new pole, but entirely underground (Figure 4-5).

For the underground components, conductors would be placed in plastic conduits laid in 4-foot-wide by 6-foot-deep trenches. Because of the heat production during operation, the trenches would then be backfilled with heat-dissipating material.

4.4.2 Transmission Line Upgrades

The proposed project would replace the neutral and phase conductors and up to 36 poles on the existing 69 kV transmission line, known as Line 2, that feeds the Mount Shasta Substation. Poles and conductor would be replaced from Pole 19/47, which is situated about 4,040 feet north of the existing substation, to Pole 2A/49, which is 2,780 feet south of the proposed substation on West Ream Avenue (Figure 4-3).

The proposed new wooden poles would support the additional weight of new 795 thousand circular mil (kcmil) aluminum conductor, steel reinforced (ACSR), which can operate at 115 kV, and an additional underbuilt distribution line. To meet conductor clearance requirements and accommodate the new distribution conductor, the proposed replacement poles would be 70–75 feet tall and no greater than 19 inches in diameter.

4.4.3 Distribution Line Upgrades

The project proposes to upgrade and rebuild two existing 4.16 kV distribution circuits to 12.47 kV and build a new third 12.47 kV circuit (see Figure 4-4).

The first distribution line, the Pioneer Feeder circuit, would be rebuilt. The neutral and three phase conductors would be strung under the rebuilt 69 kV Line 2, described above. The Pioneer Feeder circuit runs southwest for about 2,400 feet from Pole 16/48 by the substation to Pole 2/49 at Ream Avenue.

The second 12.47 kV distribution line, Black Butte Feeder, would run for 500 feet north between Poles 15/48 and 3/48 on the rebuilt Line 2 transmission poles before turning east, where it would replace the existing 4.16 kV line on existing poles that run along West Lake Street. A new underground line would then run under I-5 to Jessie Street, using existing riser poles.

The third distribution line would be a new 12.47 kV line that would be installed and built under the rebuilt Line 2 running northwest from the substation from Pole 15/48 to Pole 19/47. A new larger-capacity conductor would then replace the conductor on the existing distribution poles that run northeast to cross the I-5 overhead south of Pine Street. It should be noted that the I-5 crossing ~~will~~ would not be reconductored; only the line leading to and from this crossing would be replaced. The line would then run underground along Kingston Road and along private roads through Eskaton Washington Manor, a senior living facility, before reemerging to cross the railroad and North Mount Shasta Boulevard to supply industrial facilities on Ski Village Drive (Figure 4-4).

In addition to the three lines discussed above, pole-top stepdown transformers and distribution lines would be installed on existing poles on Chestnut Street and Mill Street to connect the new 12.47 kV lines to the existing 4.16 kV distribution system in the City.

4.4.4 Decommissioning

Upon completion of the new substation, the old substation would be decommissioned: transformers, poles, wooden structures, concrete pads, and other aboveground components would be removed. The current fencing, gravel pad, and large concrete pads would, however, remain to be used as a storage and staging area for future work maintenance and emergency maintenance activities.

4.5 Project Land Requirements

The project would use existing road or utility rights-of-way for the transmission and distribution, but would use new parcels for the new substation. Table 4-1 provides the estimated permanent and temporary acreage area required for the proposed project.

Table 4-1
Permanent and Temporary Acreages Required to Construct and Operate the Project

Component	Permanent (Acres)	Temporary (Acres)
Graded substation pad	1.2134 (substation pad)	
Improvement of existing access road, and addition of new road	0.069 (improvement to existing road) 0.184 (addition of new road) 0.253 (total)	
Transmission and distribution pole replacement	<0.002	2.238
Pulling and tensioning pads	0	2.869
Directional boring pit and disturbance	0	0.115
Temporary access roads for pole replacement	0	2.182
Storage yards/staging area	0	0.23
Total	**1.468**	**7.634**

Sources: PacifiCorp 2015, 2016b.

4.6 Construction Activities

This section provides an overview of methods for the construction of the new substation, installation of the new poles and transmission lines, and removal of the old facilities. Table 4-2 lists the typical construction equipment and personnel needed for the various construction activities. Up to 43 personnel would be required at any time, and it is anticipated that about 50% of the work force would be hired locally. The remaining workforce would take up temporary accommodation nearby and commute to the site on a daily basis.

Table 4-2
Estimated Personnel and Equipment

Activity	People	Quantity and Type of Equipment	
Demolition of Existing Structures			
Demolition		1	Excavator (with thumb)
		1	Track loader
		2	Dump trucks
Total workforce	**4***		
Substation Construction			
Construction management	1	1	Pickup truck

Table 4-2
Estimated Personnel and Equipment

Activity	People	Quantity and Type of Equipment	
Survey	3	1	Pickup truck
Site preparation/grading	5	1	Backhoe
		1	Bulldozer
		2	Dump trucks
		1	Water truck
		1	Pickup truck
Material haul	3	1	Tractor/trailer
		2	Yard and field cranes or line trucks
		1	Fork lift
Access road construction	2–3	1	Bulldozer (D-8 Cat)
		1	Motor grader
		1	Pickup truck
		1	Water truck (for construction)
Concrete placement and formwork	5	1	Pickup truck
		1	Concrete truck
		1	Flatbed truck
Steel installation	5	1	Pickup truck
		1	Crane
		1	Bucket truck
		1	Forklift
Equipment installation	4	1	Pickup truck
		1	Forklift
		1	Crane
		1	Manlift
Bus work	4	1	Pickup truck
		1	Manlift
		1	Welder
		1	Crane
Testing and energization	2	1	Pickup truck
Fencing	4		—
Marshalling yard	2		—
Right-of-way restoration and cleanup	4	1	Bulldozer wide track
		1	Dump truck
		1	Pickup truck
Total workforce	**42–43***		
Transmission/Distribution Line Construction			
Construction management	1	1	Pickup truck
Survey	3	1	Pickup truck

Table 4-2
Estimated Personnel and Equipment

Activity	People	Quantity and Type of Equipment	
Access road construction	2	1	Bulldozer (D-8 Cat)
		1	Motor grader
		1	Pickup truck
		1	Water truck
Auger holes, direct embed poles	5	1	Hole digger
		1	Water truck
		1	Pickup truck
		1	Line truck
		1	Pump
Material haul	3	1	Tractor trailer
		2	Yard and field cranes or line truck
		1	Forklift
Structure assembly and installation	5	1	Pickup truck
		1	Line truck
		1	2-ton truck
		1	Bucket truck
Structure erection	5	1	2-ton truck
		1	Pickup truck
		1	Bucket truck
		1	Line truck
Wire installation (includes old wire 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
		1	Double bull-wheel tensioner
		1	Static wire reel trailer
Right-of-way restoration and cleanup	4	1	Bulldozer wide track
		1	Dump truck
		1	Pickup truck
Total workforce	**31***		

Source: PacifiCorp 2015.

* Maximum total personnel required considering all tasks; actual personnel on site at any one time will be less.

4.6.1 Substation Construction

The proposed substation site would need to be prepared for construction. This would include the removal and demolition of existing structures, the blocking of the existing well, and the removal of existing vegetation, including all trees in the area proposed for the substation pad. It is anticipated that the size of the substation pad would require the removal of most trees on the two parcels identified for the substation. Figure 4-5 indicates the extent of tree removal expected to be required to accommodate the substation pad.

The site would then be graded in accordance with grading permit requirements of Siskiyou County. It is anticipated that up to 65,000 cubic feet of fill and material would be removed from the site during construction and disposed of at a regulated facility. It is not anticipated that additional clean fill would be brought onto the site. The site would be graded to maintain current drainage configuration and then covered in crushed rock aggregate. Clearing and grading activities are expected to take 6 to 8 weeks to complete.

After grading, belowground construction activities would begin for installation of vaults and electrical conduits for the 12.47 kV distribution circuits, the electrical conduits for equipment power and control, and the grounding grid. Following installation of these components, up to 1,500 cubic feet of concrete foundations would be poured to support the heavier aboveground steel supporting structures and substation equipment. At this time, a 7-foot-high perimeter security fence would be installed. Belowground construction activities are expected to take 4–6 weeks to complete.

The installation of aboveground equipment would overlap with the belowground work. The major substation components, including steel and aluminum support work, 69/12.47 kV transformer with enclosed load to charger, enclosed 12.47 kV switchgear, and 12.47 kV capacitor bank, would be installed over 4–8 weeks. This equipment would be configured to provide a loop in from the Path 2 69 kV transmission line to the transformer and provide three 12.47 kV circuits out to the Mount Shasta service area. The design includes bays for two additional distribution transformers that could be used to expand the capacity of the substation should load in the service area increase.

Following the installation of the aboveground structures, the control and power cables would be pulled into the substation and installed in the new equipment, which would take up to 8 weeks. Connection to the grid would be followed by commissioning, testing, and energization of the new substation, which would take another 8 weeks.

A construction staging area approximately 100 feet by 100 feet would be required to store material and equipment while the substation is being constructed. The temporary staging area would be sited adjacent to the proposed substation site on PacifiCorp property (Figure 4-7, Temporary Work Areas, Access Areas, and Access Routes). This location would include the site construction office and temporary workers' parking.

4.6.2 Overhead Transmission and Distribution Line Construction

This section describes the construction sequence and methods for overhead transmission and distribution lines. Transmission line upgrades would include the replacement of 36 poles and the existing conductor with poles capable of carrying additional distribution lines and a conductor capable of operating at 115 kV. Distribution line upgrades would include the addition of one new 12.47 kV line distribution line and the replacement of conductor and earth wires on two existing distribution lines.

Surveying

Prior to pole and conductor installation, PacifiCorp would survey for the right-of-way centerline and identify the locations and placement of new poles, the location of work boundaries, and temporary laydown areas for pole assembly.

Pole Replacement

Up to 36 poles would be replaced along the existing Line 2 right-of-way, and 2 new poles would be added to loop the existing transmission line into the new substation. It is anticipated that replacement poles would be 70–75 feet in height and no greater than 19 inches in diameter. Each pole would be brought to the location where it would be erected. Assembly would require a flat temporary work area of approximately 50 feet by 250 feet at each pole location. Wooden poles, cross arms, and insulators would be brought to the site and assembled prior to erection.

The proposed wooden poles would not require a foundation, but each pole would be directly buried. Each pole would require a 2.5-foot-wide by 11.5-foot-deep hole (removing approximately 56 cubic feet of fill). Where ground conditions allow it, each hole would be augered by a power auger mounted on the back of a vehicle. The pole would then be erected using a crane and the hole would be backfilled.

Prior to placement, wooden cross arms, insulators, insulator strings, and stringing sheaves would be installed on each pole to facilitate the subsequent pulling and tensioning of the transmission lines. Stringing sheaves are temporary pulleys that guide the conductor during the stringing process.

Pole Removal

Old poles would be loosened by a hydraulic jack and removed from the site using a truck-mounted crane and a line truck. The hole would then be backfilled using soil from project-related activities in the immediate area. The surface would then be restored to grade and reseeded using suitable native seed mix.

Erecting Guard Structures

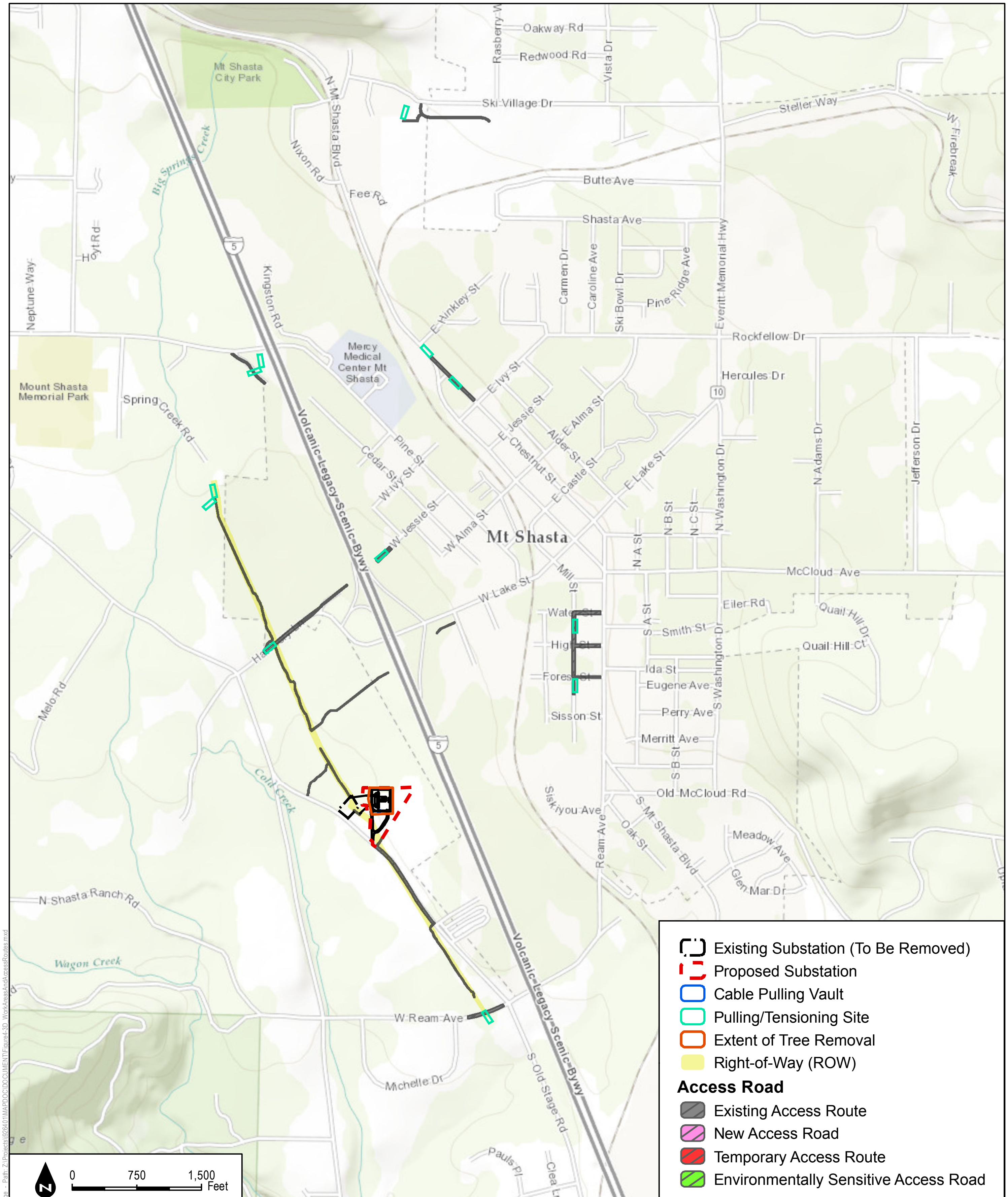
Prior to installation of conductors, guard structures would be erected over roadways for public safety. Guard structures would consist of H-frame poles placed perpendicular to the conductor line on either side of a highway crossing or obstacle. For this project, guard structures are likely to be required for crossing the railroad and North Mount Shasta Boulevard, West Lake Street, and West Ream ~~Road~~ Avenue.

Line Pulling and Tensioning

For pulling and tensioning, about 10 temporary work areas of about 50 feet by 250 feet would be cleared so that the puller, line trucks, and tractors could be positioned to pull and tension the conductors. The locations of temporary work areas have been selected to minimize the need for clearance and where feasible use existing, accessible graded areas. The locations of the temporary work areas are shown on Figure 4-7.

For each leg of the transmission and distribution line to be reconductored, a pilot line would be strung and pulled through the sheaves. The pilot line would in turn pull the thicker stringing line that would be used to guide the actual conductor though the sheaves on each pole. The process would then be repeated for each conductor and ground wire and the fiber optic shield until all wires are in position.

After the conductor is pulled in, lines would be spliced together and the wire tensioned and sagged to the required specifications before being secured to the dead-end structures. Any required mid-span splicing would be performed. Once the splicing has been completed, the wire would be sagged to the proper tension and dead-ended (secured) to structures. Finally, the wire would be secured to the insulators on each pole.


Existing Substation (To Be Removed)
Proposed Substation
Cable Pulling Vault
Pulling/Tensioning Site
Extent of Tree Removal
Right-of-Way (ROW)
Access Road
Existing Access Route
New Access Road
Temporary Access Route
Environmentally Sensitive Access Road
0 750 1,500 Feet
Mt Shasta
Mt Shasta City Park
Mercy Medical Center Mt Shasta
Mount Shasta Memorial Park
Volcanic Legacy Scenic Byway
Spring Creek Rd
Kingston Rd
N Mt Shasta Blvd
Rockfellow Dr
McCloud Ave
W Lake St
W Ream Ave
N Shasta Ranch Rd
Old McCloud Rd
Everitt Memorial Hwy
Wagon Creek
Cold Creek
Big Springs Creek

DUDEK

SOURCE: ESRI Basemaps (2016); PacifiCorp (2015)

FIGURE 4-7

Temporary Work Areas, Access Areas, and Access Routes

Lassen Substation Project

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4.6.3 Underground Distribution

Parallel runs of approximately 450 feet of conduit would be installed under I-5 from boring locations located on West Jessie Street to the west of I-5 and on West Jessie Street/Willow Street to the east of I-5. Once in place, the three insulated aluminum distribution cables would be passed through the conduit and connected to new riser poles on either side of I-5.

Temporary entry and exit pits of approximately 6 feet by 6 feet would be dug at the ends of West Jessie Street/Willow Street nearest I-5 to allow for the boring and placement of new 6-inch conduit under I-5 (a second 6-inch conduit would be installed immediately adjacent as a spare); the anticipated drill holes would be approximately 6 inches in diameter. The boring locations would occur within existing concrete areas; the street and concrete areas would be restored to existing conditions once construction of the underground distribution line is complete. Entry and exit pits would require temporary work areas of no more than 50 feet by 100 feet and would be located adjacent to the existing riser poles on West Jessie Street and Willow Street.

The drilling process generally consists of locating a conduit pipe in a hole drilled along an underground arc between entry and exit pits, if needed, on each end of the distribution line, using a boring machine that is a specialized horizontal drilling rig. The boring machine pushes and guides a drilling head connected to hollow pipe into the ground at a designated angle based on site conditions. Drilling mud and/or bentonite would be used to ensure that the hole around the conduit would be filled without voids. Based on the width of the boring (6 inches), the amount of drilling mud and/or bentonite would be minimal. When the bore head and rod emerge on the opposite side of the crossing, a special cutter, called a back reamer, is attached and pulled back through the pilot hole. The reamer bores out the pilot hole so that the pipe can be pulled through. Once the drilling is complete and the conduit is in place, the underground cables may be fed through the conduit.

Overhead to underground transition structures on both sides of the freeway would be replaced with new poles. However, it is anticipated that they would have the same configuration, height, and size as the existing structures and would be located in the same general location as the existing structures.

4.6.4 Mount Shasta Substation Demolition and Removal of Old Distribution Lines

Following the construction and energization of the Lassen Substation, the Mount Shasta Substation would be dismantled. The wooden frameworks, the transformers, and the larger concrete bases would be removed. Fencing, concrete pads, and gravel surface would remain to form a compound that would be used by PacifiCorp as a storage yard for poles and for emergency construction purpose.

After the aboveground components have been removed, the underlying soil would be sampled for oil and PCB contamination. If any contamination is detected that is above state or federal concentrations, the area would be restored in accordance with current regulatory guidelines.

4.7 Construction Schedule

Construction of the substation and replacement of transmission lines and distribution lines would occur concurrently. In order to maintain continuous service, it is anticipated that demolition of the old substation would occur after the construction of the new substation and associated facilities. Working a 10-hour day over a 5-day week, the construction activity would consist of about 41 weeks of work over a maximum of 12 months. Work within the City of Mount Shasta would be limited to the hours between 7:00 a.m. and 5:00 p.m. on weekdays. Table 4-3 provides a more detailed breakdown of the construction sequence, assuming a 41-week schedule (PacifiCorp 2016c).

Table 4-3
Proposed Schedule for Construction of the Project

Task	Maximum Work Days	Weeks
		1 8 15 23 31 39 41
Demolition and grading for new substation	40	
Below-grade Construction	30	
Above-grade construction	40	
Installation power and control cables	40	
Commissioning new substation	40	
Old substation demolition	10	
Aerial transmission construction	172	
Distribution line construction	192	

Source: PacifiCorp 2016c.

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4.8 Operation and Maintenance

Operational activities would be similar to present activities; maintenance and repair crews would visit on a monthly or as-needed basis. Transmission line inspection would be in accordance with GO-95 and GO-165 and would usually be expected to occur on an annual or half-yearly basis, or as needed should repair issues or outages arise.

4.9 Applicant Proposed Measures

The PEA details project protocols that would be followed during project-related activities (PacifiCorp 2015). Project protocols are specific to environmental issue areas and are herein termed applicant proposed measures (APMs). Table 4-4 lists APMs proposed as project design features. These APMs are analyzed as part of the proposed project.

Table 4-4
Applicant Proposed Measures

APM Number	Description
	Air Quality
APM-AQ-1	**Construction Pollutant Reduction Measures:** Particulate matter emissions shall be controlled by implementing standard construction dust control measures including, but not limited to, the following: • Minimize soil disturbance. • Regularly water disturbed areas, including on-site vehicle/equipment travel routes and soil stockpiles. Watering should be sufficient to prevent airborne dust from leaving the site. • Curtail earthmoving activities on windy days. • Ensure that the engines of all construction equipment are properly tuned. • Limit the maximum speed to 15 miles per hour on unpaved surfaces. • Replant vegetation in disturbed areas as quickly as possible. • Implement other effective particulate matter control measures, as needed. Greenhouse gas emissions generated during project construction shall be minimized by implementing the following measures: • Use California Air Resources Board-certified construction equipment, where available. • Use alternative fuel types for construction equipment where feasible. • Use local building materials. • Limit construction vehicle idling time. Other criteria pollutant emissions generated during project construction shall be minimized by implementing the following measures: • Use California Air Resources Board-certified construction equipment, where available. • Use alternative fuel types for construction equipment where feasible. • Use local building materials. • Limit construction vehicle idling time.

Table 4-4
Applicant Proposed Measures

APM Number	Description
	Biological Resources
APM-BIO-1	Focused pre-construction surveys for special-status plant species shall be conducted in appropriate habitat~~,~~ and at the time of year when species are both evident and identifiable (typically when the species is flowering or fruiting), according to U.S. Fish and Wildlife Service ~~(USFWS)~~ and California Department of Fish and Wildlife (CDFW) protocols for species having a specified protocol, or according to standard, scientifically accepted systematic surveys appropriate for each species. Surveys ~~will~~ shall be conducted in areas of planned ground disturbance prior to such disturbance occurring. To the extent feasible, avoidance modifications in the placement of transmission towers, access and spur roads, and of various marshalling and staging areas shall be made in accordance with the final project design and needs. If special-status plant species are located during focused surveys within the project area, avoidance measures shall be incorporated. If avoidance is not possible, relocation efforts, including topsoil salvage and relocation, if necessary, will be implemented. If PacifiCorp proposes any changes to the current construction plan or pole replacement sites after focused surveys for special-status species are conducted, additional field surveys shall be required prior to construction activities. Pre-construction biological clearance surveys shall be conducted to avoid or minimize potential impacts to special-status wildlife species. This includes surveys for bat species, which shall be conducted by a qualified bat biologist and shall include focused searches for daytime and maternal roost sites appropriate for the bat species most likely to be roosting within the project right-of-way. If active bat roosts are discovered during pre-construction surveys, the qualified bat biologist shall coordinate with CDFW on appropriate avoidance/minimization measures, including the type and timing of such measures, to be implemented. If active special-status mammal burrows are located during surveys, avoidance measures shall be incorporated and the Environmental Monitor shall proceed as described in APM-BIO-6. Any special-status plant or wildlife species observed during pre-construction surveys shall be recorded, and such observations shall be reported to the California Natural Diversity Database.
APM-BIO-2	Prior to first use, the undercarriages, wheels, and bodies of construction and operations equipment previously used outside of the project area shall be thoroughly washed in maintenance yards by high-pressure jets to eliminate any soil buildup that may contain invertebrates, such as insects and insect eggs, or the seeds of exotic plant species.
APM-BIO-3	Every reasonable effort shall be made to minimize temporary and permanent removal of native vegetation at work areas. If required, native vegetation shall be flagged for avoidance. If native vegetation cannot be avoided, it will be crushed or cut rather than bladed or rooted out. A project revegetation plan shall be prepared for areas of native vegetation temporarily affected by project construction activities. The revegetation plan shall be prepared by a qualified botanist or revegetation specialist and submitted to the California Department of Fish and Wildlife for review prior to any construction or ground disturbance of the area that will be temporarily impacted. The plan shall include, at a minimum, a discussion of the following: qualifications and experience of individuals performing the revegetation; methods (including soil preparation, seeding, planting, irrigating) to be used to revegetate the impacted area; monitoring methods and data to be collected on the revegetated area; success criteria; steps to be taken if the revegetation is not successful; and adaptive management to be implemented.
APM-BIO-4	Construction crews shall avoid affecting the streambeds and banks of any streams along the route, to the extent feasible. If necessary, a Lake and Streambed Alteration Agreement (LSAA) shall be prepared and submitted to the California Department of Fish and Wildlife for review and approval prior to construction in the affected area~~ will be secured from the CDFW~~. Impacts ~~will~~ shall be mitigated based on the terms of the LSAA. No streams with flowing waters or those capable of supporting special-status species would be expected to have permanent adverse impacts from project implementation.
APM-BIO-5	To avoid impacts from temporary access to wetland areas, existing access roads and temporary access methods (e.g., high density polyethylene (HDPE) driving mats, portable road platforms) shall be used to access pole replacement sites. Results of the wetland delineation (Appendix D of the PEA) shall be

Table 4-4
Applicant Proposed Measures

APM Number	Description
	incorporated into vehicle access routes, which shall be designed to avoid and minimize wetland disturbance.
APM-BIO-6	Environmental Monitors shall be assigned to the project, and will be responsible for ensuring that impacts to special-status species, wetlands, native vegetation, wildlife habitat, and unique resources are avoided to the fullest extent possible. The monitor shall delineate and mark for avoidance in the field all known sensitive resource locations and, where appropriate, use flagging to delineate boundaries of areas from where activities are restricted to protect wetlands, native plants and wildlife, or special-status species. If the monitor determines that project activities may adversely affect the species, the monitor shall have authority to halt construction activities until the monitor can consult with the U.S. Fish and Wildlife Service ~~USFWS~~ and/or California Department of Fish and Wildlife ~~CDFW~~ regarding appropriate avoidance measures. These restricted areas shall be monitored during construction to ensure their protection.
APM-BIO-7	PacifiCorp shall conduct all pole installation, conductor installation, tree trimming, tree removal, grading and clearing of vegetation from September 1 to February 28, outside of the nesting season. The March 1–August 31 nesting season dates are guidelines: nesting season may begin earlier or end later depending on weather conditions; active nests will be protected using appropriate buffers regardless of the calendar date. If construction cannot be completed outside of the nesting season, pre-construction surveys within the project area will be conducted by a qualified biologist for nests prior to ground disturbance, tree trimming, or other construction activities. The nesting bird clearance survey will be conducted within 3 days prior to construction activities. For passerines, a 50-foot buffer will be installed around the nest and maintained around the nest until the young have fledged. A larger buffer may be required if nesting birds appear stressed. Nesting raptors require a larger buffer area than passerines. If a raptor nest is observed, a 300-foot buffer will be installed. If a nesting raptor is observed within 300 feet of the project area prior to the start of construction, a qualified biologist will determine whether or not construction activities could potentially disturb nesting raptors and implement appropriate measures (e.g., on-site monitor, timing restriction) to adequately protect nesting raptors. Any special-status bird species observed during pre-construction surveys shall be recorded, and such observations shall be reported to the California Natural Diversity Database.
APM-BIO-8	A Worker Environmental Awareness Program (WEAP) shall be prepared and all construction crews and contractors shall be required to participate in WEAP training prior to starting work on the project. The WEAP training shall include a review of the special-status species and other sensitive resources that could occur in the project area, the locations of any existing sensitive resources, their legal status and protections, and measures to be implemented for avoidance of these sensitive resources. A record of all personnel trained shall be maintained.
APM-BIO-9	Migratory bird flight paths in the project area are currently unknown. An impact assessment study and bird observation surveys shall be conducted according to the Avian Power Line Interaction Committee's (APLIC's) (1994) survey protocol. The surveys shall be conducted within wetlands along both sides of the existing transmission line within the study area. The surveys shall be done in consultation with the California Department of Fish and Wildlife. ~~CDFW.~~ Results of the bird observation surveys will determine potentially impacted species and locations to mark wires to increase their visibility to flying birds. Line markers should be designed to be raptor-safe in accordance with the Suggested Practices for Raptor Protection on Power Lines: The State of the Art in 2012 (APLIC 2012), evaluated and approved by PacifiCorp engineers prior to implementation.
APM-BIO-10	Vehicles shall be restricted to previously established roadways and access routes.
APM-BIO-11	Trash, dumping, firearms, open fires, hunting, and pets shall be prohibited in the project area.
APM-BIO-12	If construction within and near potential willow flycatcher ~~Willow Flycatcher~~ habitat (riparian scrub and surrounding wet meadow) cannot be completed outside of the willow flycatcher ~~Willow Flycatcher~~ breeding season (June 1 through ~~to~~ August 31), broadcast surveys shall be conducted to determine presence/absence of the species prior to construction activities. If absence is determined, construction may begin within the

Table 4-4
Applicant Proposed Measures

APM Number	Description
	potential Willow Flycatcher habitat. If presence is determined, flycatcher ~~detections~~ nests ~~will~~ shall be buffered by ~~150~~ 500 feet, or as otherwise determined in consultation with the California Department of Fish and Wildlife, and construction activities ~~will~~ shall not occur within the buffer area for the remainder of the breeding season. Any willow flycatcher observed during surveys shall be recorded, and such observations shall be reported to the California Natural Diversity Database.
APM-BIO-13	Operation and maintenance activities that must occur in or near potential willow flycatcher ~~Willow Flycatcher~~ habitat (riparian scrub and surrounding wet meadow) ~~will~~ shall be conducted outside of the willow flycatcher ~~Willow Flycatcher~~ breeding season (June 1 through ~~to~~ August 31), whenever practicable. If project construction occurs within habitat occupied by nesting willow flycatcher, because the species is state listed as endangered, a state Incidental Take Permit would be required.
	Geology and Soils
APM-GEO-1	The project will be designed and constructed in accordance with recommendations included in the project-specific geotechnical investigation: site grading, excavation and utility trenches, foundations, mitigation of soil corrosivity on concrete, seismic design criteria, and unpaved site access road.
	Greenhouse Gas Emissions
APM-AQ-1	**Construction Pollutant Reduction Measures:** Particulate matter emissions shall be controlled by implementing standard construction dust control measures including, but not limited to, the following: • Minimize soil disturbance. • Regularly water disturbed areas, including on-site vehicle/equipment travel routes and soil stockpiles. Watering should be sufficient to prevent airborne dust from leaving the site. • Curtail earthmoving activities on windy days. • Ensure that the engines of all construction equipment are properly tuned. • Limit the maximum speed to 15 miles per hour on unpaved surfaces. • Replant vegetation in disturbed areas as quickly as possible. • Implement other effective particulate matter control measures, as needed. Greenhouse gas emissions generated during project construction shall be minimized by implementing the following measures: • Use California Air Resources Board-certified construction equipment, where available. • Use alternative fuel types for construction equipment where feasible. • Use local building materials. • Limit construction vehicle idling time. Other criteria pollutant emissions generated during project construction shall be minimized by implementing the following measures: • Use California Air Resources Board-certified construction equipment, where available. • Use alternative fuel types for construction equipment where feasible. • Use local building materials. • Limit construction vehicle idling time.

Table 4-4
Applicant Proposed Measures

APM Number	Description
	Hazards and Hazardous Materials/Fire Safety
APM-HAZ-1	**Health and Safety Plan.** A health and safety plan ~~Health and Safety Plan~~ shall be prepared and made available once a contractor is procured for the construction of the proposed project. The plan should include, and not be limited to, information on the appropriate personal protective equipment to be used during construction. All transport of hazardous materials would be in compliance with applicable laws, rules and regulations, including the acquisition of required shipping papers, package marking, labeling, transport vehicle placarding, training, and registrations.
APM-HAZ-2	**Hazardous Substance Control and Emergency Response Plan.** PacifiCorp shall prepare and implement a Hazardous Substance Control and Emergency Response Plan as needed. The procedures identify methods and techniques to minimize the exposure of the public and site workers to potentially hazardous materials during all phases of project construction through operation. The plan would include, but not be limited to, worker training appropriate to the site worker's role in hazardous substance control and emergency response. The procedures also require implementing appropriate control methods and approved containment and spill-control practices for construction and materials stored on site. If it is necessary to store chemicals on site, they would be managed in accordance with all applicable regulations. Material safety data sheets would be maintained and kept available on site, as applicable. All hazardous materials and hazardous wastes would be handled, stored, and disposed of in accordance with all applicable regulations, by personnel qualified to handle hazardous materials. The hazardous substance control and emergency response procedures include, but are not limited to, the following: • Proper disposal of potentially contaminated soils. • Establishing site-specific buffers for construction vehicles and equipment located near sensitive resources. • Emergency response and reporting procedures to address hazardous material spills. • Stopping work at that location and contacting the County Fire Department Hazardous Materials Unit immediately if visual contamination or chemical odors are detected. Work will be resumed at this location after any necessary consultation and approval by the Hazardous Materials Unit. PacifiCorp will complete its Emergency Action Plan Form as part of project tailboard meetings. The purpose of the form is to gather emergency contact numbers, first aid location, work site location, and tailboard information.
APM-HAZ-3	**Spill Prevention, Countermeasure, and Control (SPCC) Plan.** An SPCC plan shall be prepared and certified by a professional engineer; a complete copy would be maintained on site. The SPCC plan would include engineered and operational methods for preventing, containing, and controlling potential releases and provisions for a quick and safe cleanup.
	Hydrology and Water Quality
APM-WQ-1	**Stormwater Pollution Prevention Plan (SWPPP) or Erosion Control Plan Development and Implementation.** An erosion and sediment control plan would be developed prior to construction and included as part of the required SWPPP. The goal of the SWPPP will be to remove sediment and wastes from runoff before the runoff is 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. • Removing sediment from runoff before it leaves the site. • Complying with specific erosion and sediment control measures specified within the erosion and sediment control plan. Methods may include preservation of existing vegetation or use of geomats, straw wattles, straw bale barriers,

Table 4-4
Applicant Proposed Measures

APM Number	Description
	or silt fencing, which would be placed at construction boundaries. Gravel ramps may be installed at access points to public roadways to prevent or minimize the tracking of mud, dirt, sediment, or similar materials onto the roadway. Selection of appropriate erosion control materials will be based on soil properties, steepness of the slope, and anticipated surface flow or runoff. Diesel fuel, gasoline, oil, and other lubricants, as well as adhesives and sealants, would be utilized during the construction of the transmission line and substation. Bulk quantities may be stored in the designated construction yard/staging area. Vehicle fueling and maintenance activities would be restricted to staging areas or approved areas away from drainage channels and sensitive habitats. All construction vehicles would be monitored for leaks and receive regular off-site preventive maintenance to reduce the chance of leakage. A copy of the SWPPP and of Receipt of the Letter of Intent, including the project's Waste Discharge ID Number, will be provided to the California Public Utilities Commission prior to construction to certify compliance with Order 2009-0009-DWQ Construction General Permit. The SWPPP will be updated during construction as required by the State Water Resources Control Board.
APM-WQ-2	**Restoration.** To reduce visual contrast and siltation in construction where ground disturbance is substantial, surface preparation and reseeding shall occur during the last phase of construction. The method of restoration would normally consist of loosening the soil surface, reseeding, installing cross drains for erosion control, placing water bars in the road, and filling ditches. These actions shall occur in areas of exposed soils large enough that, if they remain unremediated once construction is completed, they could exceed water quality objectives of receiving waters (e.g., for sediment, turbidity, temperature, and dissolved oxygen) set forth in the Water Quality Control Plan for the Sacramento and San Joaquin River Basins.
APM-WQ-3	**Pole Placement Minimization/Avoidance.** To minimize the amount of sensitive features disturbed in designated areas, poles would be placed so as to avoid sensitive features and/or to allow conductors to clearly span the features, within limits of standard pole design. If the sensitive features cannot be completely avoided, poles would be placed so as to minimize the disturbance.
Transportation and Traffic	
APM-TT-1	**Traffic Management Plan.** Prior to the start of construction, PacifiCorp shall prepare a Traffic Management Plan. The Plan would define the use of flag persons, warning signs, lights, barricades, cones, etc. to control construction traffic. The Plan would include but not be limited to the following: • All property owners and residents of streets affected by construction shall be notified prior to the start of construction. Advance public notification shall include postings of notices and appropriate signage of construction activity. Access to all residences and properties near the project shall be maintained at all times. • All construction activities shall be coordinated with local law enforcement and fire protection agencies. Emergency service providers shall be notified of the timing, location, and duration of construction activities. • Road use-related wear and tear shall be documented during construction of transmission line facilities and PacifiCorp shall repair any damaged roadway sections, as applicable.

Sources: PacifiCorp 2015, 2016a.

4.10 Key Permits and Approvals

Key permits and approvals presumed necessary for implementation of the proposed project are presented in Table 4-5.

Table 4-5
Required Permits and Approvals

Permit/Approval	Accepting Authority/ Approving Agency	Statutory Reference
Federal		
Clean Water Act 404 Preconstruction Notification	U.S. Army Corps of Engineers	Clean Water Act, Section 404; 33 CFR 320–330
Permit to cross Federal-Aid Highway	Federal Highway Administration	23 CFR 1.23 and 1.27; 23 CFR 645 Subpart B; 23 CFR 77
State of California		
Permit to Construct	CPUC	CEQA, Cal Pub. Res. Code Sec. 21000 et seq. and Public Utilities Code Section 1001
Encroachment Permit	California Department of Transportation, District 2 – Redding	Section 671.5(a) of the California Streets and Highways Code
Streambed Alteration Program – Notification	California Department of Fish and Wildlife, Northern Region (1)	Fish and Game Code, Sections 1602 and 1603
Section 401 CWA Water Quality Certification	State Water Resources Control Board – California Water Quality Control Board for Central Valley, Region 5 (Redding Office)	Federal Clean Water Act, Section 401
State Waste Discharge Requirements (WDRs) – obtained as part of the 401 Water Quality Certification	State Water Resources Control Board – California Water Quality Control Board for Central Valley, Region 5 (Redding Office)	Porter-Cologne Water Quality Control Act
General Discharge Permits for Storm Water Associated with Construction Activity	State Water Resources Control Board – S.M.A.R.T.S. Database	Federal Clean Water Act, Section 402

4.11 References Cited

17 CCR 95350–95359. "Regulation for Reducing Sulfur Hexafluoride Emissions from Gas Insulated Switchgear (Refs & Annos)."

PacifiCorp. 2015. *Lassen Substation Proponent's Environmental Assessment*. Prepared by Power Engineers. October 2015.

PacifiCorp. 2016a. Lassen Substation Response to CPUC Data Request 2.0. Prepared by Power Engineers.

PacifiCorp. 2016b. Lassen Substation Amendment. Prepared by Power Engineers.

PacifiCorp. 2016c. Lassen Substation Response to CPUC Data Request 1.0. Prepared by Power Engineers.

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