Exhibit B
Project Description

Boardman to Hemingway Transmission Line Project

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Preliminary Application for Site Certificate

February 2013

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ACRONYMS AND ABBREVIATIONS

Note: Not all acronyms and abbreviations listed will appear in this Exhibit.

°C	degrees Celsius
4WD	4-wheel-drive
A	ampere
A/ph	amperes/phase
AC	alternating current
ACDP	Air Contaminant Discharge Permit
ACEC	Area of Critical Environmental Concern
ACSR	aluminum conductor steel reinforced
AIMP	Agricultural Impact Mitigation Plan
AMS	Analysis of the Management Situation
aMW	average megawatt
ANSI	American National Standards Institute
APE	Area of Potential Effect
APLIC	Avian Power Line Interaction Committee
ARPA	Archaeological Resource Protection Act
ASC	Application for Site Certificate
ASCE	American Society of Civil Engineers
ASP	Archaeological Survey Plan
AST	aboveground storage tank
ASTM	American Society of Testing and Materials
ATC	available transmission capacity
ATV	all-terrain vehicle
AUM	animal unit month
B2H	Boardman to Hemingway Transmission Line Project
BCCP	Baker County Comprehensive Plan
BCZSO	Baker County Zoning and Subdivision Ordinance
BLM	Bureau of Land Management
BMP	best management practice
BPA	Bonneville Power Administration
BOR	Bureau of Reclamation
C and D	construction and demolition
CAA	Clean Air Act
CadnaA	Computer-Aided Noise Abatement
CAFE	Corona and Field Effects
CAP	Community Advisory Process
CBM	capacity benefit margin
CFR	Code of Federal Regulations
CH	critical habitat
CIP	critical infrastructure protection
CL	centerline
cm	centimeter
cmil	circular mil
COA	Conservation Opportunity Area
CO_2e	carbon dioxide equivalent

COM Plan	Construction, Operations, and Maintenance Plan
CPCN	Certificate of Public Convenience and Necessity
cps	cycle per second
CRP	Conservation Reserve Program
CRT	cathode-ray tube
CRUP	Cultural Resource Use Permit
CSZ	Cascadia Subduction Zone
CTUIR	Confederated Tribes of the Umatilla Indian Reservation
CWA	*Clean Water Act of 1972*
CWR	Critical Winter Range
dB	decibel
dBA	A-weighted decibel
DC	direct current
DoD	Department of Defense
DOE	U.S. Department of Energy
DOGAMI	Oregon Department of Geology and Mineral Industries
DPS	Distinct Population Segment
DSL	Oregon Department of State Lands
EA	environmental assessment
EDRR	Early Detection and Rapid Response
EIS	Environmental Impact Statement (DEIS for Draft and FEIS for Final)
EFSC or Council	Energy Facility Siting Council
EFU	Exclusive Farm Use
EHS	extra high strength
EMF	electric and magnetic fields
EPA	Environmental Protection Agency
EPC	Engineer, Procure, Construct
EPM	environmental protection measure
EPRI	Electric Power Research Institute
ERO	Electric Reliability Organization
ERU	Exclusive Range Use
ESA	Endangered Species Act
ESCP	Erosion and Sediment Control Plan
ESU	Evolutionarily Significant Unit
EU	European Union
FAA	Federal Aviation Administration
FCC	Federal Communication Commission
FEMA	Federal Emergency Management Agency
FERC	Federal Energy Regulatory Commission
FFT	find, fix, track, and report
FLPMA	Federal Land Policy and Management Act
Forest Plan	Land and Resource Management Plan
FPA	Forest Practices Act
FSA	Farm Services Agency
FWS	U.S. Fish and Wildlife Service
G	gauss

GeoBOB	Geographic Biotic Observation
GF	Grazing Farm Zone
GHG	greenhouse gas
GHz	gigahertz
GIL	gas insulated transmission line
GIS	geographic information system
GPS	Global Positioning System
GRMW	Grande Ronde Model Watershed
GRP	Grassland Reserve Program
HAC	Historic Archaeological Cultural
HCNRA	Hells Canyon National Recreation Area
HPFF	high pressure fluid-filled
HPMP	Historic Properties Management Plan
HUC	Hydrologic Unit Code
Hz	hertz
I-84	Interstate 84
ICC	International Code Council
ICES	International Committee on Electromagnetic Safety
ICNIRP	International Commission on Non-Ionizing Radiation Protection
IDAPA	Idaho Administrative Procedures Act
IDEQ	Idaho Department of Environmental Quality
IDFG	Idaho Department of Fish and Game
IDWR	Idaho Department of Water Resources
ILS	intensive-level survey
IM	Instructional Memorandum
INHP	Idaho Natural Heritage Program
INRMP	Integrated Natural Resources Management Plan
IPC	Idaho Power Company
IPUC	Idaho Public Utilities Commission
IRP	integrated resource plan
IRPAC	IRP Advisory Council
ISDA	Idaho State Department of Agriculture
JPA	Joint Permit Application
KCM	thousand circular mils
kHz	kilohertz
km	kilometer
KOP	Key Observation Point
kV	kilovolt
kV/m	kilovolt per meter
kWh	kilowatt-hour
L_{dn}	day-night sound level
L_{eq}	equivalent sound level
lb	pound
LCDC	Land Conservation and Development Commission
LDMA	Lost Dutchman's Mining Association
LiDAR	light detection and ranging
LIT	Local Implementation Team

LMP	land management plan
LOLE	Loss of Load Expectation
LRMP	land and resource management plan
LUBA	Land Use Board of Appeals
LWD	large woody debris
m	meter
mA	milliampere
MA	Management Area
MAIFI	Momentary Average Interruption Frequency Index
MCC	Malheur County Code
MCCP	Morrow County Comprehensive Plan
MCE	Maximum Credible Earthquake
MCZO	Morrow County Zoning Ordinance
mG	milligauss
MHz	megahertz
mm	millimeter
MMI	Modified Mercalli Intensity
MP	milepost
MPE	maximum probable earthquake
MRI	magnetic resonance imaging
MVAR	megavolt ampere reactive
Mw	mean magnitude
MW	megawatt
μV/m	microvolt per meter
N_2O	nitrous oxide
NAIP	National Agriculture Imagery Program
NED	National Elevation Dataset
NEMS	National Energy Modeling System
NEPA	*National Environmental Policy Act of 1969*
NERC	North American Electric Reliability Corporation
NESC	National Electrical Safety Code
NF	National Forest
NFPA	National Fire Protection Association
NFS	National Forest System
NGDC	National Geophysical Data Center
NHD	National Hydrography Dataset
NHOTIC	National Historic Oregon Trail Interpretive Center
NHT	National Historic Trail
NIEHS	National Institute of Environmental Health Sciences
NIST	National Institute of Standards and Technology
NOAA	National Oceanic and Atmospheric Administration
NOAA Fisheries	National Oceanic and Atmospheric Administration Fisheries Division
NOI	Notice of Intent to File an Application for Site Certificate
NOV	Notice of Violation
NPDES	National Pollutant Discharge Elimination System
NRCS	Natural Resources Conservation Service

NRHP	National Register of Historic Places
NSR	noise sensitive receptor
NTTG	Northern Tier Transmission Group
NWGAP	Northwest Regional Gap Analysis Landcover Data
NWI	National Wetlands Inventory
NWPP	Northwest Power Pool
NWR	National Wildlife Refuge
NWSRS	National Wild and Scenic Rivers System
NWSTF	Naval Weapons Systems Training Facility
O_3	ozone
O&M	operation and maintenance
OAIN	Oregon Agricultural Information Network
OAR	Oregon Administrative Rules
OATT	Open Access Transmission Tariff
ODA	Oregon Department of Agriculture
ODEQ	Oregon Department of Environmental Quality
ODF	Oregon Department of Forestry
ODFW	Oregon Department of Fish and Wildlife
ODOE	Oregon Department of Energy
ODOT	Oregon Department of Transportation
OHGW	overhead ground wire
OHV	off-highway vehicle
OPGW	optical ground wire
OPRD	Oregon Parks and Recreation Department
OPS	U.S. Department of Transportation, Office of Pipeline Safety
OPUC	Public Utility Commission of Oregon
OR	Oregon (State) Highway
ORBIC	Oregon Biodiversity Information Center
ORS	Oregon Revised Statutes
ORWAP	Oregon Rapid Wetland Assessment Protocol
OS	Open Space
OSDAM	Oregon Streamflow Duration Assessment Methodology
OSHA	Occupational Safety and Health Administration
OSSC	Oregon Structural Specialty Code
OSWB	Oregon State Weed Board
OWC	Oregon Wetland Cover
P	Preservation
PA	Programmatic Agreement
pASC	Preliminary Application for Site Certificate
PAT	Project Advisory Team
PCE	Primary Constituent Element
PEM	palustrine emergent
PFO	palustrine forested
PGA	peak ground acceleration
PGE	Portland General Electric
PGH	Preliminary General Habitats
Pike	Pike Energy Solutions

PNSN	Pacific Northwest Seismic Network
POD	Plan of Development
POMU	Permit to Operate, Maintain and Use a State Highway Approach
PPH	Preliminary Priority Habitats
Project	Boardman to Hemingway Transmission Line Project
PSD	Prevention of Significant Deterioration
PSS	palustrine scrub-shrub
R	Retention
R-F	removal-fill
RCM	Reliability Centered Maintenance
RCRA	Resource Conservation and Recovery Act
ReGAP	Regional Gap Analysis Project
RFP	request for proposal
RLS	reconnaissance-level survey
RMP	resource management plan
ROD	Record of Decision
ROE	right of entry
RNA	research natural area
ROW	right-of-way
SAIDI	System Average Interruption Duration Index
SAIFI	System Average Interruption Frequency Index
SC	Sensitive Critical
SEORMP	Southeastern Oregon Resource Management Plan
SF6	sulfur hexafluoride
Shaw	Shaw Environmental and Infrastructure, Inc.
SHPO	State Historic Preservation Office
SLIDO	Statewide Landslide Inventory Database for Oregon
SMS	Scenery Management System
SMU	Species Management Unit
SPCC	Spill Prevention, Containment, and Countermeasures
SRMA	Special Recreation Management Area
SRSAM	Salmon Resources and Sensitive Area Mapping
SSURGO	Soil Survey Geographic Database
STATSGO	State Soil Geographic Database
SUP	special-use permit
SV	Sensitive Vulnerable
SWPPP	Stormwater Pollution Prevention Plan
T/A/Y	tons/acre/year
TDG	Total Dissolved Gas
TES	threatened, endangered, and sensitive (species)
TG	Timber Grazing
TMIP	Transmission Maintenance and Inspection Plan
TNC	The Nature Conservancy
tpy	tons per year
TSD	treatment, storage, and disposal
TV	television
TVES	Terrestrial Visual Encounter Surveys

TVMP	Transmission Vegetation Management Program
UBAR	Umatilla Basin Aquifer Restoration
UBWC	Umatilla Basin Water Commission
UCDC	Umatilla County Development Code
UCZPSO	Union County Zoning, Partition and Subdivision Ordinance
UDP	Unanticipated Discovery Plan
U.S.	United States
USACE	U.S. Army Corps of Engineers
U.S.C.	United States Code
USDA	U.S. Department of Agriculture
USFS	U.S. Department of Agriculture, Forest Service
USGS	U.S. Geological Survey
UWIN	Utah Wildlife in Need
V/C	volume to capacity
V	volt
VAHP	Visual Assessment of Historic Properties
VMS	Visual Management System
VQO	Visual Quality Objective
VRM	Visual Resource Management
WAGS	Washington ground squirrel
WCU	Wilderness Characteristic Unit
WECC	Western Electricity Coordinating Council
WHO	World Health Organization
WMA	Wildlife Management Area
WOS	waters of the state
WOUS	waters of the United States
WPCF	Water Pollution Control Facility
WR	winter range
WRCC	Western Regional Climate Center
WRD	(Oregon) Water Resources Division
WRP	Wetland Reserve Program
WWE	West-wide Energy
XLPE	cross-linked polyethylene

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Exhibit B
Project Description

1.0 INTRODUCTION

Exhibit B provides a detailed description of the proposed Boardman to Hemingway Transmission Line Project (Project), as required by Oregon Administrative Rule (OAR) 345-021-0010(1)(b), paragraphs (A) through (F). OAR Chapter 345 Division 22 does not provide an approval standard relating to contents of Exhibit B.

1.1 Overview of Proposed Facility

Idaho Power Company (IPC) is proposing to construct, operate, and maintain an approximately 306-mile-long electric transmission line between Boardman, Oregon, and the Hemingway Substation located in southwestern Idaho as an extension of IPC's electric transmission system. This length comprises approximately 282 miles in Oregon and 24 miles in Idaho. The Project is primarily a single-circuit 500-kilovolt (kV) electric transmission line, with 301 miles of single-circuit 500-kV electric transmission line, a 5-mile rebuild of existing 138-kV and 69-kV transmission lines onto double-circuit structures, and relocation of 0.3 mile of a 138-kV transmission line.

Exhibit B explains IPC's need for the Project, and why IPC selected a transmission line project between Boardman, Oregon, and Hemingway, Idaho, as a key component of IPC's preferred resource portfolio, which contains the combination of resources that best balances cost, risk, and environmental concerns. Exhibit B demonstrates that the Proposed Corridor for the Project is the result of careful consideration of key siting criteria, including specifically the eight criteria identified by the Energy Facility Siting Council (EFSC or Council). As explained in Exhibit B and its attachments, IPC has designed its Proposed Corridor to avoid or minimize impacts to biological, cultural, and other resources to the maximum extent possible; where avoidance of one resource would result in impact to another, the Proposed Corridor represents IPC's best efforts to appropriately balance those competing concerns. In some locations, IPC has identified an alternate corridor segment for a portion of its Proposed Corridor or substation location that would strike a different balance but still meet the purpose and need of the Project.

IPC is submitting this Preliminary Application for Site Certificate to the Oregon Department of Energy (ODOE) and EFSC for authorization to construct, operate, and maintain the portion of the Project in the State of Oregon.[1]

Specifically, Oregon portions of the Project for which IPC is seeking a Site Certificate include the following:

<u>Transmission Lines</u>

- Proposed Corridor: 277.2 miles of proposed 500-kV transmission line corridor, 5.0 miles of proposed double-circuit 138/69-kV transmission line corridor, and 0.3 mile of proposed 138-kV transmission line corridor.
- Alternate Corridor Segments: Seven alternate corridor segments consisting of approximately 134.1 miles that could replace certain segments of the Proposed Corridor.

[1] The portions of the Project in the state of Idaho are only mentioned where additional context is needed to understand the analysis or results or to meet Analysis Area requirements described in the Project Order.

Substations

IPC's application proposes three different substations, but IPC will ultimately select only one of the following substations for development:

- Proposed Grassland Substation Expansion. A 3-acre expansion of Portland General Electric's (PGE) proposed 34-acre Grassland Substation located southwest of Boardman, Oregon.
- Alternate Horn Butte Substation. A 20-acre substation that is an alternative endpoint to the Proposed Corridor several miles west of the proposed Grassland Substation. IPC would independently develop the full facility.
- Alternate Longhorn Substation Expansion. A 3-acre expansion of Bonneville Power Administration's (BPA) proposed Longhorn Substation located near the Port of Morrow.

Communication Facilities

- Eight proposed communication station sites of less than one acre in size.
- Four alternate communication station sites of less than one acre in size.
- Distribution lines to communication station sites.[2]

Related and Supporting Facilities

- Permanent and temporary access roads.
- Temporary multi-use areas, pulling and tensioning sites, and fly yards.

A preliminary design has been completed for this Project, and the details are described in this Exhibit. As Project development continues, changes to the Project description provided in this Exhibit will occur. Those changes will not depart from the basic form-and-function of the Project.

An overview map of the Project location is included as Figure B-1. Details of the Project location are found in Exhibit C.

[2] As explained in greater detail in Section 3.3 of Exhibit B, each communication station will require electric power service. IPC will request electric service from the local service provider, and that service provider will be responsible for the permitting and construction required to extend the closest local distribution line to the new communication station. It is IPC's position that these distribution lines do not fall within the definition of "related and supporting facilities" in ORS 469.300(24) because they are not now, and will not be, "proposed by the applicant." Based on preliminary informal direction from ODOE, IPC has included the distribution lines in the Project Site Boundary for this Preliminary Application for Site Certificate (ASC). However, IPC will remove the distribution lines from its ASC upon receipt of additional guidance from ODOE confirming that the distribution lines are not "related and supporting facilities" subject to EFSC jurisdiction.

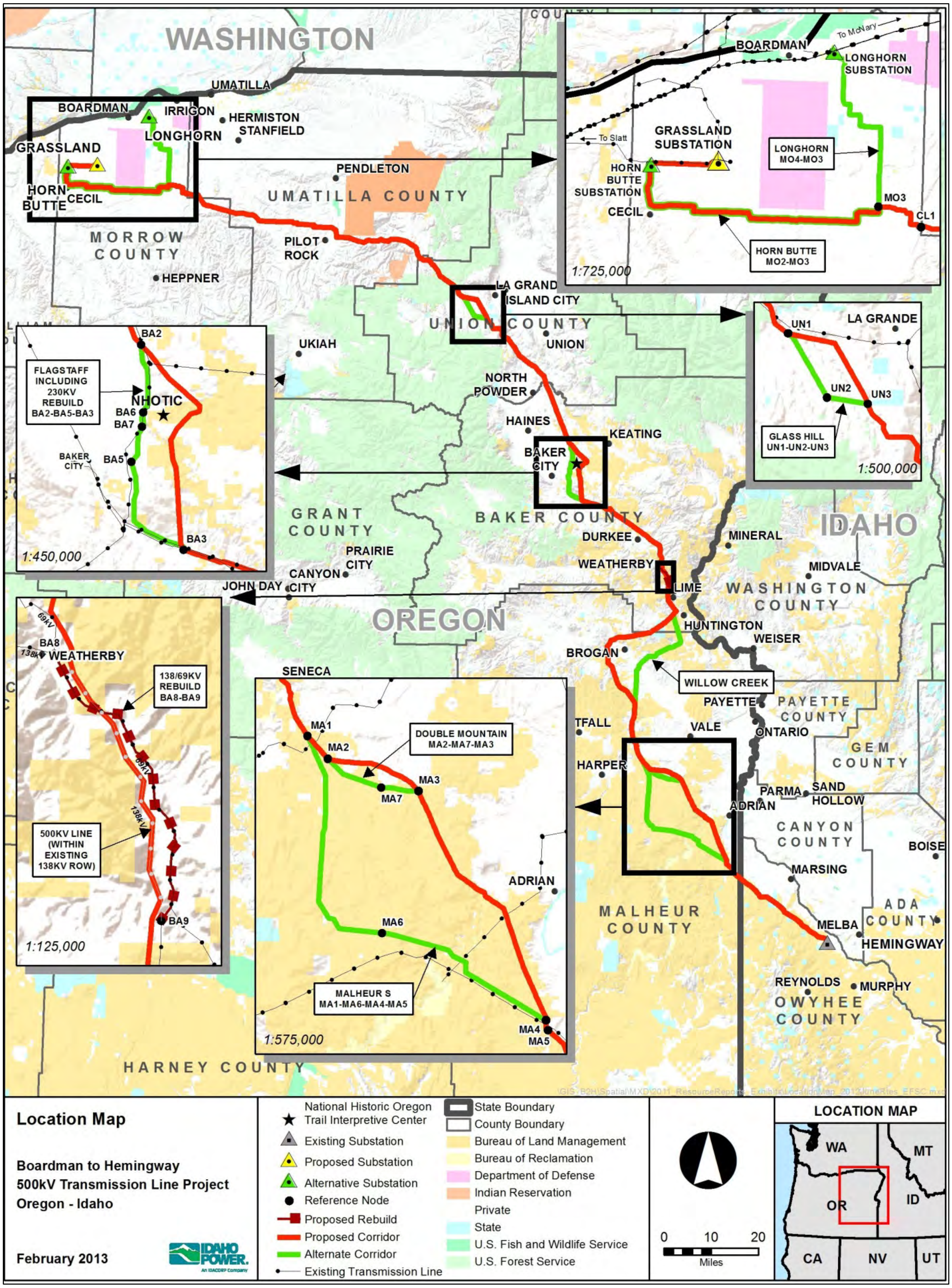


Figure B-1. Location Map

1.2 Purpose and Need

IPC is required, by both federal and state laws, to plan for and meet load and transmission requirements. IPC has identified the Project as a critical component of an overall resource portfolio that best balances cost, risk, and environmental concerns; as explained in detail in Exhibit N, Section 3.0, both the Idaho and Oregon public utility commissions have acknowledged resource portfolios that identify the Project as a key resource.

For purposes of Exhibit B, a general discussion of the purpose of, and need for, the Project provides essential background for the discussion of how IPC selected its Proposed Corridor. The Project is designed to allow IPC to meet the following three critical needs:

- **Serve Native Loads.** First, the Project is the most cost-effective and viable option for IPC to serve its retail customers located in the states of Idaho and Oregon. The primary purpose of the Project is to provide IPC with the additional transmission capacity that will be necessary to import power from the Pacific Northwest power market. Currently, IPC does not have adequate transmission capacity to increase its on-peak power purchases on the western side of its system. As described in the Company's 2011 Integrated Resource Plan (IRP), the Project will remedy this transmission constraint by allowing IPC to import 450 megawatts (MW) of market purchases to serve its native load (IPC 2011). In this way, the Project is properly viewed as a supply-side resource, similar to a generation plant, which will allow IPC to meet its expected loads. Further, better access to the Pacific Northwest power market is critical because that market is very liquid with a high number of participants and transactions. On the other hand, purchasing power from the eastern side of IPC's system is not a viable alternative to the Project because of the lack of liquidity in the east-side markets and the long-term risk of price escalation.
- ***Meet Transmission Reliability Standards.*** Second, the Project is an integral component of regional transmission planning and is neither required to support any particular new generation facility nor justified by any particular existing generation facility. Rather, the Project will serve as a crucial high-capacity connection between two key points in the existing bulk electric system that currently lack sufficient transmission paths. The bulk electric system can be thought of as a network of "hubs" and "spokes," where substations serve as central "hubs" that send and receive electricity along distribution lines or "spokes." For this system to work reliably there must be a network of high-capacity transmission lines connecting major "hubs." These high-capacity transmission lines are often the only way to transport electricity from where it is generated to where it is needed to serve load. As discussed in detail in Exhibit N, the Project will serve as a crucial high-capacity "backbone" connecting the load served by IPC's Hemingway Substation to electricity available in the Boardman, Oregon, vicinity, and vice versa, depending on the time of year. This will allow IPC to maintain reliable electric service pursuant to the standards set forth by the North American Electric Reliability Corporation (NERC) and implemented by the Western Electricity Coordinating Council (WECC). The Project will also relieve congestion of the existing transmission system and enhance the reliable, efficient, and cost-effective energy transfer capability between the Pacific Northwest and Intermountain regions.
- ***Provide Transmission Service to Wholesale Customers***. Third, the Project allows IPC to comply with the requirements of the Federal Energy Regulatory Commission (FERC), which require IPC to construct adequate transmission infrastructure to provide service to wholesale customers in accordance with IPC's Open Access Transmission Tariff (OATT). IPC received more than 4,000 MW of requests to commence transmission service between 2005 and 2014 on the Idaho–Northwest transmission path. However, of the 4,000 MW of service requests, only 133 MW were granted up through 2007 due to

the limited available transmission capacity of the existing system. Moreover, IPC expects interconnection and transmission requests to increase as renewable resources continue to be developed in northeast Oregon.

In summary, the Project will provide additional capacity for the delivery of up to 450 MW of needed energy to IPC's Boise service area, alleviate reliability constraints, and relieve existing transmission congestion in the region. These objectives can only be met by connecting into the existing 500-kV transmission grid. System modeling and coordination with other transmission providers determined that the interconnection point needed to be along the Boardman–Slatt 500-kV transmission line. More recently, a connection point on the McNary-Slatt transmission line was determined feasible and an alternate substation site was established and designated the Alternate Longhorn Substation Expansion (See Figure B-1). A second alternate substation site (Alternate Horn Butte Substation) to connect into the Boardman-Slatt line was also identified.

1.3 Project Endpoints

In developing its proposal for the Project, IPC initially recognized that its load, reliability, and wholesale transmission obligations would be best served by a transmission line project connecting IPC's service territory and transmission system to the Pacific Northwest power market. The primary reasons that IPC identified connection to the Pacific Northwest power market as critical are as follows:

- Historically, IPC has been a "summer peaking" utility, while most other utilities in the Pacific Northwest experience system peak loads during the winter. For this reason, IPC is able to purchase energy from the Pacific Northwest market to meet peak summer load and sell excess energy to others during the spring season. This practice benefits IPC's customers by avoiding the construction of additional peaking resources and producing revenue from off-system sales used to offset total power supply expenses.
- Although IPC has transmission interconnections to the south and east, the Pacific Northwest market is the preferred source of purchased power. The Pacific Northwest market has a large number of participants, high transaction volume, and is very liquid. The accessible power markets south and east of IPC's system tend to be smaller, less liquid, and have greater transmission distances.
- Historically, during IPC's peak hour load periods, off-system market purchases from the south and east have proven to be unavailable or very expensive. Many of the utilities to the south and east of IPC also experience a summer peak and the weather conditions that drive IPC's summer peak hour load are often similar across the Intermountain Region. Therefore, IPC cannot rely on imports from the Intermountain Region for planning purposes.
- Other transmission providers have expressed interest in a transmission line connecting southwestern Idaho to the Boardman area, and IPC anticipates that several transmission providers will invest in the Project. Should any excess capacity exist in the near term, the Project could accommodate additional regional energy transactions. Both of these activities will increase the value of the Project to IPC customers and the region as they allow IPC to invest only in the capacity that it requires over the long term and charge its customers for the actual capacity used to serve load.
- During the project conceptualization process, IPC determined that a 230-kV project would not meet IPC's overall resource planning requirements, and would constitute an underutilization of a substantial transmission right-of-way (ROW). IPC selected a project

operating voltage of 500-kV to meet its resource planning requirements, as well as to match the existing ultrahigh-voltage transmission grid in the Pacific Northwest.

For these reasons, the purpose and need for the Project led directly to the identification of the Project's endpoints. IPC identified one endpoint in the Boardman, Oregon, area because it is the easternmost point at which IPC can feasibly interconnect to the Pacific Northwest market. More specifically, IPC identified PGE's proposed Grassland Substation as the endpoint that would best serve the Project's purpose and need, as well as two alternate endpoints in the Boardman area.[3] IPC identified the other endpoint at IPC's existing Hemingway Substation because it is the westernmost point in IPC's existing transmission system that could accommodate termination of a 500-kV transmission line.

2.0 APPLICABLE RULES AND STATUTES

OAR 345-021-0010(1)(b) provides that Exhibit B to an Application for Site Certificate must include the following:

(A) A description of the proposed energy facility, including as applicable:

(i) The nominal electric generating capacity and the average electrical generating capacity, as defined in ORS 469.300;

*(ii) Major components, structures, and system * * *;*

(iii) A site plan and general arrangements of buildings, equipment and structures;

(iv) Fuel and chemical storage facilities, including structures and systems for spill containment;

(v) Equipment and systems for fire prevention and control.

(B) A description of major components, structures, and systems of each related or supporting facility.

(C) The approximate dimensions of major facility structures and visible features.

(D) If the proposed energy facility is a pipeline or a transmission line or has, as a related or supporting facility, a transmission line or pipeline that, by itself, is an energy facility under the definition in ORS 469.300, a corridor selection assessment explaining how the applicant selected the corridor(s) for analysis in the application. In the assessment, the applicant shall evaluate the corridor adjustments the Department has described in the project order, if any. The applicant may select any corridor for analysis in the application and may select more than one corridor. However, if the applicant selects a new corridor, then the applicant must explain why the applicant did not present the new corridor for comment at an informational meeting under OAR 345-015-0130. In the assessment, the applicant shall discuss the reasons for selecting the corridor(s), based upon evaluation of the following factors:

(i) Least disturbance to streams, rivers and wetlands during construction.

(ii) Least percentage of the total length of the pipeline or transmission line that would be located within areas of Habitat Category 1, as described by the Oregon Department of Fish and Wildlife.

[3] For additional discussion and a detailed description of IPC's proposed endpoints for the Project, see Exhibit B, Section 3.2.2.2 regarding substations.

(iii) Greatest percentage of the total length of the pipeline or transmission line that would be located within or adjacent to public roads and existing pipeline or transmission line rights-of-way.

(iv) Least percentage of the total length of the pipeline or transmission line that would be located within lands that require zone changes, variances or exceptions.

(v) Least percentage of the total length of the pipeline or transmission line that would be located in a protected area as described in OAR 345-022-0040.

(vi) Least disturbance to areas where historical, cultural or archaeological resources are likely to exist.

(vii) Greatest percentage of the total length of the pipeline or transmission line that would be located to avoid seismic, geological and soils hazards.

(viii) Least percentage of the total length of the pipeline or transmission line that would be located within lands zoned for exclusive farm use.

(E) If the proposed energy facility is a pipeline or transmission line or has, as a related or supporting facility, a transmission line or pipeline of any size:

(i) The length of the pipeline or transmission line.

(ii) The proposed right-of-way width of the pipeline or transmission line, including to what extent new right-of-way will be required or existing right-of-way will be widened.

(iii) If the proposed transmission line or pipeline corridor follows or includes public right-of-way, a description of where the transmission line or pipeline would be located within the public right-of-way, to the extent known. If the applicant proposes to locate all or part of a transmission line or pipeline adjacent to but not within the public right-of-way, describe the reasons for locating the transmission line or pipeline outside the public right-of-way. The applicant must include a set of clear and objective criteria and a description of the type of evidence that would support locating the transmission line or pipeline outside the public right-of-way, based on those criteria.

(iv) For pipelines, the operating pressure and delivery capacity in thousand cubic feet per day and the diameter and location, above or below ground, of each pipeline.

(v) For transmission lines, the rated voltage, load carrying capacity, and type of current and a description of transmission line structures and their dimensions.

(F) A construction schedule including the date by which the applicant proposes to begin construction and the date by which the applicant proposes to complete construction. Construction is defined in OAR 345-001-0010. The applicant shall describe in this exhibit all work on the site that the applicant intends to begin before the Council issues a site certificate. The applicant shall include an estimate of the cost of that work. For the purpose of this exhibit, "work on the site" means any work within a site or corridor, other than surveying, exploration or other activities to define or characterize the site or corridor, that the applicant anticipates or has performed as of the time of submitting the application.

Additionally, the Project Order includes the following additional guidance regarding the contents of Exhibit B:

- *All paragraphs apply except (A)(vi), (vii), and (viii).*
- *The description of the proposed facility in the application will form the basis for the description of the facility in the site certificate. The site certificate will require that IPC will build the facility "substantially as described." Exhibit B will also provide the basis for the project description in the notice of application that ODOE will issue to reviewing agencies and public. Therefore, Exhibit B should describe the project in enough detail for members of the public and reviewing agencies to make informed comments. It should describe the project sufficiently for ODOE staff to verify that the constructed project will meet any representations that are the basis for any findings of compliance with applicable regulations for standards, but need not include descriptive material that IPC would not want to be held to in a condition.*
- *The application must clearly describe the width of the corridor in which the micrositing corridor right-of-way would be sited along the length of the proposed line. The application must specify the width of the permanent right-of-way IPC will request, and must justify that width. The Council may direct IPC to acquire a narrower right-of-way in areas that are important for agriculture or for habitat, and it may allow a wider right-of-way at certain locations for staging areas. The application must also explain in detail what limitations would be placed on the property owner in the transmission line right-of-way.*
- *The alternatives analysis described in section OAR 345-021-0010(1)(b)(D) must be consistent with the analysis required by ORS 215.275 and the required information in this rule. The Council recognizes that some of the factors in this rule compete with one another (for example, the requirements to both avoid habitat land and avoid farm land), but expects the application to demonstrate that all required factors were considered.*

As documented in Table B-11 (Submittal Requirements Matrix), IPC has drafted Exhibit B to respond to each paragraph of OAR 345-021-0010(1)(b) described above, as well as the additional requirements set forth in the Project Order.

3.0 INFORMATION REQUIRED BY OAR 345-021-0010(1)(B)

Consistent with EFSC's rules, the primary purposes of Exhibit B are to describe how and why IPC selected the Project and its Proposed Corridor, and to provide detailed information regarding the Project facilities (major components, structures, and systems). The specific details regarding the location of the Project and the Project Site Boundary are discussed in Exhibit C.

Because the corridor selection assessment is essential to a proper understanding of the Project, and logically flows from IPC's purpose and need for the Project, IPC's Exhibit B explains IPC's corridor selection first and then describes the facility components. Section 3.0 provides the information required by the rule in the following order:

Section 3.1 Corridor Selection Assessment (OAR 345-0210-0010[1][b][D])
Section 3.2 Description of the Proposed Facility
Section 3.3 Related and Supporting Facilities
Section 3.4 Approximate Dimensions
Section 3.5 Information Required for Transmission Line Projects
Section 3.6 Construction Schedule
Section 3.7 Limitations on Use of the Right-of-Way (Project Order Comments)

3.1 Corridor Selection Assessment – OAR 345-021-0010(1)(b)(D)

> **OAR 345-021-0010(1)(b)(D)** If the proposed energy facility is a pipeline or a transmission line or has, as a related or supporting facility, a transmission line or pipeline that, by itself, is an energy facility under the definition in ORS 469.300, a corridor selection assessment explaining how the applicant selected the corridor(s) for analysis in the application. In the assessment, the applicant shall evaluate the corridor adjustments the Department has described in the project order, if any. The applicant may select any corridor for analysis in the application and may select more than one corridor. However, if the applicant selects a new corridor, then the applicant must explain why the applicant did not present the new corridor for comment at an informational meeting under OAR 345-015-0130. In the assessment, the applicant shall discuss the reasons for selecting the corridor(s), based upon evaluation of the following factors:
> (i) Least disturbance to streams, rivers and wetlands during construction;
> (ii) Least percentage of the total length of the pipeline or transmission line that would be located within areas of Habitat Category 1, as described by the Oregon Department of Fish and Wildlife;
> (iii) Greatest percentage of the total length of the pipeline or transmission line that would be located within or adjacent to public roads, as defined in ORS 368.001, and existing pipeline or transmission line rights-of-way;
> (iv) Least percentage of the total length of the pipeline or transmission line that would be located within lands that require zone changes, variances or exceptions;
> (v) Least percentage of the total length of the pipeline or transmission line that would be located in a protected area as described in OAR 345-022-0040;
> (vi) Least disturbance to areas where historical, cultural or archaeological resources are likely to exist; and
> (vii) Greatest percentage of the total length of the pipeline or transmission line that would be located to avoid seismic, geological and soils hazards;
> (viii) Least percentage of the total length of the pipeline or transmission line that would be located within lands zoned for exclusive farm use;

IPC has faced a unique set of challenges in selecting a Proposed Corridor for the Project. For the Project to meet IPC's purpose and need, the Project endpoints represent the only initial corridor selection criteria; the Project does not have necessary midpoints (i.e., other substations) that constrain the location of the corridor, and there is no existing utility corridor that could be followed for all or even a majority of the Project.

Thus, IPC's initial corridor selection process involved evaluation of an 11-county study area as shown in Figure B-2 and a virtually unlimited number of possible corridors that could connect the identified endpoints. As illustrated in a broad sense in Figure B-3, which shows selected key constraints, the study area identified by IPC includes an extremely complex assortment of siting constraints, including the following:

- Extensive areas of agricultural land (land zoned exclusive farm use [EFU]);
- Vast areas that are owned and managed by the Bureau of Land Management (BLM), U.S. Department of Agriculture, Forest Service (USFS), and other federal agencies charged with managing the numerous resources in the mountains and high desert; and
- The presence of many sensitive resources, including key wildlife habitat, protected areas, and cultural resources.

In order to select a corridor for the Project that avoids impacts to lands zoned EFU as well as other resources, IPC engaged in an extensive corridor selection process. The resulting Proposed Corridor between the northern Project terminus near Boardman, Oregon, and the southern terminus at the Hemingway Substation in Idaho is over 300 miles long, which is nearly 75 miles longer than a direct line.

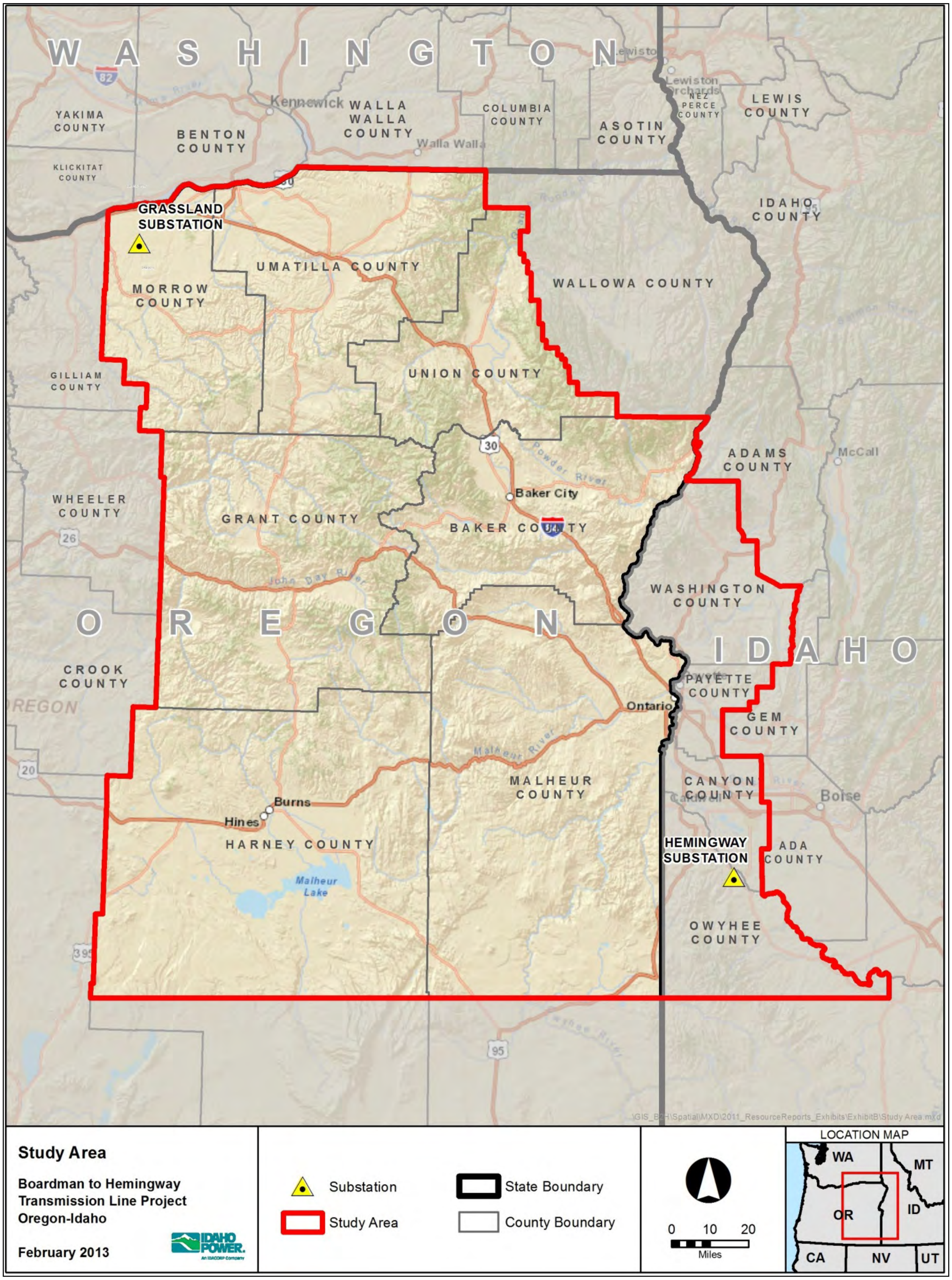


Figure B-2. Study Area

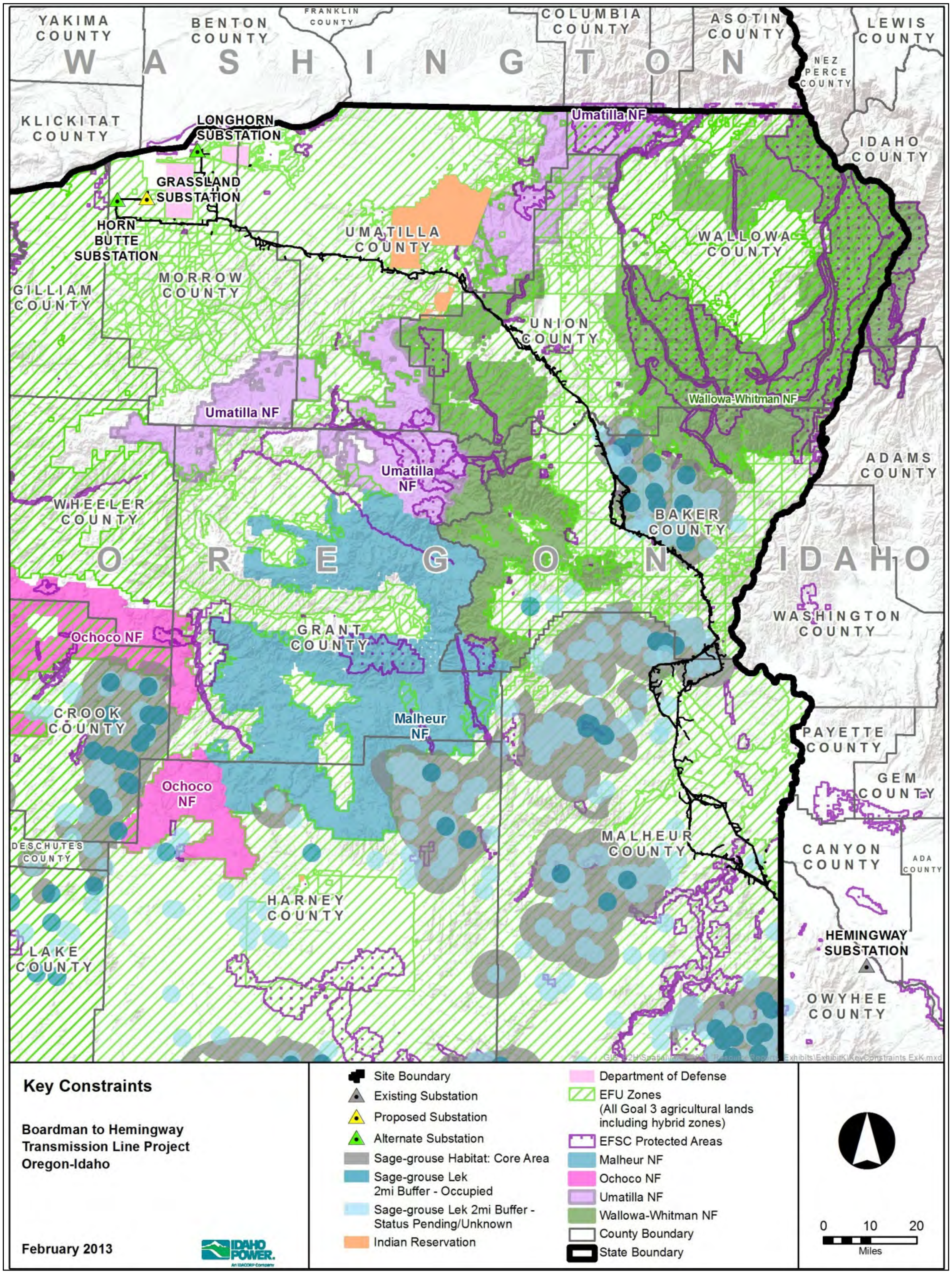


Figure B-3. Selected Key Constraints

IPC's corridor selection process occurred primarily in two phases: Phase One between 2008 and 2010, and Phase Two between 2010 and 2012. IPC has published two studies that detail its siting process for the Project: Attachment B-1, Siting Study (August 2010) and Attachment B-2, Supplemental Siting Study (June 2012).[4] The following discussion summarizes IPC's general approach to siting, both phases of IPC's corridor selection process, and how IPC selected its Proposed Corridor based on careful consideration of numerous siting criteria, including the eight criteria set forth in OAR 345-021-0010(1)(b)(D) and the six factors in ORS 215.275.

3.1.1 Initial Study Area: Constraints and Opportunities

IPC defined a study area for the Project that extended from the proposed Grassland Substation in Morrow County, Oregon, to the Hemingway Substation in Owyhee County, Idaho. This area includes much of eastern Oregon (7 counties) and southwest Idaho (4 counties) as shown in Figure B-2. In total, the study area comprises all or portions of 11 counties as listed in Table B-1 covering approximately 31,422 square miles of which 44.3 percent is privately owned and 57.7 percent is government-owned.

Table B-1. Counties in the Study Area

Oregon Counties	Idaho Counties
Morrow County	Washington County
Umatilla County	Canyon County
Union County	Payette County
Baker County	Owyhee County
Malheur County (portion)	
Grant County	
Harney County (portion)	

Proceeding south and east, the study area transitions from a large agricultural area south of the Columbia River to the mountains in the middle of the study area and to a large area of irrigated farmland on both sides of the Snake River in the south. Development is greatest in the Snake River Valley, especially on the Idaho side of the river, and along I-84 around Baker City, La Grande, Pendleton, Hermiston, and Boardman. There are four national forests covering large portions of the central mountainous area that are managed by the USFS for a large number of biological, scenic, recreation, and other resources. The BLM manages a variety of resources and a large portion of the high desert areas in the southern half of the study area.

3.1.1.1 Constraints

IPC defined "constraints" as resources or conditions that potentially limit transmission line routing because of relative sensitivity to facility construction or operation and/or regulatory restrictions. Data collection and meetings with stakeholders resulted in over 200 data sets and helped establish the level of permitting importance of each constraint for siting alternative corridors. The list of siting constraints is provided in Table B-2.

Geographically, the study area comprises three general landscapes—agricultural areas, mountains, and high desert. Each landscape requires consideration of a unique set of constraints when identifying and evaluating feasible corridors for the development of a new transmission line.

Agricultural Areas – There are large agricultural areas in the north, in the south, and in Baker and Union counties. Northern Morrow and Umatilla counties include many farms with pivot

[4] In the siting studies, the term "route" is used in instead of "corridor." The use of the term route in those studies should be considered synonymous with "corridor" for the purposes of this Exhibit.

irrigation as well as extensive areas of dryland farming. Baker and Union counties both have substantial agricultural areas with development focused in and around Baker City and La Grande. In the south, conditions are similar except that there is more development especially in the Idaho portion of the study area.

High Desert – Areas of high desert extend across much of the southern half of the study area up into Baker and Grant counties. Much of the land is managed by the BLM and is designated as Areas of Critical Environmental Concern (ACECs), wilderness study areas, and other special resource management areas; there are also large areas of sage-grouse habitat[5]. There are a number of small cities and towns but overall development occupies a small percentage of the high desert.

Mountainous Area – The mountainous areas such as the Blue Mountains present very challenging topography with many areas of steep slopes in excess of 35 percent and other areas of unstable slopes presenting design and construction challenges. National forests including the Wallowa-Whitman, Malheur, Umatilla, and Ochoco occupy much of the forested mountainous area (see Figure B-3). Some examples of the most challenging constraints in this area include wilderness areas, wilderness study areas, wild and scenic rivers, special status streams, inventoried roadless areas, and USFS visual quality objectives.

Land Use Zones – Under Oregon law, counties are required to zone agricultural lands to achieve compliance with Statewide Planning Goal 3 (Agriculture). Similarly, counties are required to zone forest lands to achieve compliance with Statewide Planning Goal 4 (Forest Lands). The land in the study area is zoned primarily for agricultural and forest uses; urban and non-resource lands are scarce (see Figure B-4). As shown in Figure B-4, Goal 3 resource lands include all lands designated by counties as either a qualifying exclusive farm use zone or a hybrid agriculture/forest zone. Accordingly, the terms “exclusive farm use” or “EFU” are used in this Exhibit to refer to all Goal 3 resource lands (including hybrid zones). Avoidance of EFU land, and particularly irrigated agricultural lands, was a key siting objective. However, because EFU lands cover approximately 77 percent of the study area in Oregon, avoidance of EFU lands was not possible. See Exhibit K, Section 3.

Site-specific Constraints – Many other more site-specific constraints were considered such as the growing number of wind farms, government-owned lands such as the Boardman Bombing Range, historic resources such as the Oregon National Historic Trail (NHT), and habitat for protected species such as the Oregon-listed Washington ground squirrel. Many of the constraints identified by IPC in the study area fall into one of the eight categories of resources identified in OAR 345-021-0010(1)(b)(D), as illustrated in Table B-2. Where applicable, the right column of Table B-2 indicates with which of the eight factors identified by OAR 345-021-0010(1)(b)(D)(i) through (viii) the particular constraint is associated.

[5] At the time of the initial siting study, Oregon Department of Fish and Wildlife guidance stated that Category 1 sage-grouse habitat comprised all habitat within 2 miles of leks, unless site-specific habitat conditions, terrain, or existing man-made features potentially would reduce the category level.

Table B-2. 2008–2010 Siting Constraints Table

Constraint	Potential OAR 345-021-0010(1)(b)(D) Siting Factor
Cultural Resources	
Burns District Archaeological Site	vi
Burns District Traditional Use Areas	vi
Cemetery	vi
Historic Trail (Idaho)	NA[1]
Intact Oregon Trail Segment (OR BLM)	vi
National Historic Oregon Trail Interpretive Center	vi
National Register Historic Point Site	vi
Oregon Trail	vi
Oregon Trail Brochure – Trail rut	vi
Vale District Archaeological Site	vi
Within 0.5 mile of National Register Historic Place Buffer	vi
Within 1,200 foot Historic Trail Buffer	vi
Within 500 feet of Cemetery	vi
Fish and Wildlife	
Burns District Bald Eagle Site	ii
Burns District Raptor Site	ii
IDFG Big Game Crucial Winter Range	NA
IDFG Bighorn Sheep Range	NA
IDFG Focal Area	NA
IDFG Sage-grouse Lek	NA
ODFW Big Game Deer Winter Range	ii
ODFW Big Game Elk Winter Range	ii
ODFW Bighorn Sheep Range	ii
ODFW Conservation Opportunity Area	ii
ODFW Sage-grouse Lek	ii
Prineville District Fish Restoration Area	ii
Prineville District Wildlife Habitat Seasonal Closure Area	ii
Pronghorn Antelope Habitat (Boise District, ID)	NA
Sage-grouse Core Area 1: Sagebrush Habitat (Oregon)	ii
Sage-grouse Core Area 2: Potential Habitat (Oregon)	ii
Sage-grouse Core Area 3: Non-Sagebrush Shrublands and Grasslands (Oregon)	ii
Sage-grouse Key Habitat Area (ID BLM)	NA
Sage-grouse Restoration Habitat Type 1: Perennial Grasslands (ID BLM)	NA
Sage-grouse Restoration Habitat Type 2: Annual Grass Understories (ID BLM)	NA
Sage-grouse Restoration Habitat Type 3: High Restoration Potential (ID BLM)	NA

Table B-2. Siting Constraints (continued)

Constraint	Potential OAR 345-021-0010(1)(b)(D) Siting Factor
Washington Ground Squirrel 785ft Buffer	ii
Within 2-mile Idaho Sage-grouse Lek Buffer (Active)	NA
Within 2-mile Idaho Sage-grouse Lek Buffer (Inactive)	NA
Within 2-mile Idaho Sage-grouse Lek Buffer (Unknown)	NA
Within 2-mile Oregon Sage-grouse Lek Buffer (Occupied but able to be Permitted)	ii
Within 2-mile Oregon Sage-grouse Lek Buffer (Occupied)	ii
Within 2-mile Oregon Sage-grouse Lek Buffer (Unoccupied)	ii
Within 300ft Special Status Stream/Lake: Bull Trout	i
Within 300ft Special Status Stream: Chinook Salmon	i
Within 300ft Special Status Stream: Chinook Salmon	i
Within 300ft Special Status Stream: Coho Salmon	i
Within 300ft Special Status Stream: Coho Salmon	i
Within 300ft Special Status Stream: Cutthroat Trout	i
Within 300ft Special Status Stream: Cutthroat Trout	i
Within 300ft Special Status Stream: Red Band Trout	i
Within 300ft Special Status Stream: Red Band Trout	i
Within 300ft Special Status Stream: Sockeye Salmon	i
Within 300ft Special Status Stream: Steelhead	i
Within 300ft Special Status Stream: Steelhead	i
Geology and Soils	
Erosion Hazard: High (NRCS Soil Data - Grant Co, OR data n/a)	vii
Erosion Hazard: High (Prineville District, OR)	vii
Erosion Hazard: Low (NRCS Soil Data - Grant Co, OR data n/a)	vii
Erosion Hazard: Moderate (NRCS Soil Data - Grant Co, OR data n/a)	vii
Fault Line	vii
Idaho Landslide Susceptibility: High	NA
Idaho Landslide Susceptibility: Low	NA
Idaho Landslide Susceptibility: Moderate	NA
Oregon Landslide Feature: Fan	vii
Oregon Landslide Feature: Landslide	vii
Oregon Landslide Feature: Talus-Colluvium	vii
Prime Farmland/Arable Land: Soils Class 1-4	vii
U.S. Geological Survey Active Mining Area	vii
Within 500ft of Fault Line	vii
Slope	
Slope 0-15%	vii
Slope 15-25%	vii
Slope 25-35%	vii

Table B-2. Siting Constraints (continued)

Constraint	Potential OAR 345-021-0010(1)(b)(D) Siting Factor
Slope >35%	vii
Land Use	
Area of Critical Environmental Concern	v
Birch Creek Interpretive Site	v
Birds of Prey National Conservation Area	NA
BLM Recreation Site (Oregon and Idaho)	v
BLM Wild and Scenic River: Recreation	v
BLM Wild and Scenic River: Scenic	v
BLM Wild and Scenic River: Suitable Lands (Prineville District, OR)	v
BLM Wild and Scenic River: Wild	v
BLM Wilderness Study Area (Oregon/Idaho)	v
Burns District Off-Highway Vehicle: Limited	O[2]
Burns District Off-Highway Vehicle: Seasonal Closure	O
Burns District ROW Avoidance Corridor	O
City Impact Area - Idaho	NA
Community Park (Idaho)	NA
Confederated Tribes of the Umatilla Indian Reservation	O
Cropland/Irrigated Agriculture	O
CTWSR Forrest Conservation Area	O
CTWSR Oxbow Conservation Area	O
Dairy Farms (Idaho)	NA
Forested Land: Private	iv
Forested Land: Public	iv
Grazing Allotment - ID	NA
Grazing/Pasture - OR	O
Hells Canyon National Recreation Area	v
Hospitals	O
Howard Meadows	O
Idaho Parks and Recreation Site	NA
IDFG Wildlife Management Area	NA
Irrigated Agriculture/Cropland	O
Lands with Wilderness Characteristics (OR BLM)	O
Lower Powder Valley	O
Morrow County Park	v
National Forest Inventoried Roadless Area	v
National Forest Military Operations Area	O
National Forest Old Growth Forest Stand	ii
National Forest Recreation Site	v
National Forest Special Use Areas	v

Table B-2. Siting Constraints (continued)

Constraint	Potential OAR 345-021-0010(1)(b)(D) Siting Factor
National Forest Wilderness Area	v
National Forest: Special Interest Area	v
National Wildlife Refuge	v
Naval Weapons System Training Facility	O
North Powder Valley	O
Noxious Weeds (OR BLM)	O
ODFW Wildlife Management Area	v
Oregon Fish Hatcheries	v
Oregon State Park	v
Oregon/Idaho Trails	O
Prineville District Lands Proposed for Acquisition by the BLM	O
Prineville District Noxious Weeds	O
Prineville District Off-Highway Vehicle: Closed	O
Prineville District Off-Highway Vehicle: Limited Use	O
Prineville District Old Growth Forest	ii
Prineville District Proposed Area of Critical Environmental Concern	v
Prineville District Special Recreation Management Area	O
Proposed Wilderness Study Area (ONDA)	O
Proposed Wind Farm Boundary (Burns District, OR)	O
Restricted Airspace - Airport	O
Special Recreation Management Area (Malheur RA, Vale District, OR)	v
Starkey Game Management Area	v
The Nature Conservancy: Portfolio	O
The Nature Conservancy: Preserve	O
Thief Valley Reservoir	O
Urban Area	O
Urban Growth Boundary - Oregon	O
Vale District Off-Highway Vehicle: Closed	O
Vale District Off-Highway Vehicle: Limited to Designated Routes	O
Vale District Off-Highway Vehicle: Limited to Existing Routes	O
Virtue Flat OHV Park	O
Wild Horse and Burro Area (OR BLM)	O
Wind Farm Boundary	O
Land Ownership/Management	
Bureau of Land Management	O
Bureau of Reclamation	O
Indian Reservation	O
Military Land	O

Table B-2. Siting Constraints (continued)

Constraint	Potential OAR 345-021-0010(1)(b)(D) Siting Factor
National Forest Land	O
National Park Service	v
Other Federal Land	O
Private Land	O
State Land	O
US Fish and Wildlife Service Land	O
Visual Resources	
BLM Visual Resource Management Class 1	O
BLM Visual Resource Management Class 2	O
BLM Visual Resource Management Class 3	O
BLM Visual Resource Management Class 4	O
Devine Scenic Corridor (Burns District)	O
National Forest Scenic Visual Corridor (ONF)	O
National Forest Visual Quality Objective: Maximum Modification	O
National Forest Visual Quality Objective: Modification	O
National Forest Visual Quality Objective: Partial Retention	O
National Forest Visual Quality Objective: Preservation	O
National Forest Visual Quality Objective: Retention	O
Scenic Byway	O
Viewshed Area (Baker County)	O
Within 1200ft Nationally Designated Scenic Byway	O
Water and Wetlands	
303d Lakes	i
303d Streams	i
Floodplain: 500-yr Flood Zone	i
Floodplain: Area Not Mapped	i
Floodplain: Not in Flood Zone	i
Floodplain: Zone A	i
Floodplain: Zone AE	i
Floodplain: Zone ANI	i
Floodplain: Zone AO	i
National Wetland Inventory	i
Oregon State Scenic Waterway	v
Oregon Watershed Restoration Inventory Facility (within 500ft Buffer of linear feature)	i
Oregon Watershed Restoration Inventory Facility (within 500ft of site location)	i
Oregon Watershed Restoration Inventory Facility Area	i
Snake River	i

Table B-2. Siting Constraints (continued)

Constraint	Potential OAR 345-021-0010(1)(b)(D) Siting Factor
Zoning	
Airport	iv
Exclusive Farm Use Zone	viii
Forest	iv
Mineral & Aggregate	iv
Natural Resource	iv
Park	iv
Reserve	iv
Rural Commercial	iv
Rural Industrial	iv
Rural Residential	iv
Rural Service Center	iv
Urban	iv

[1] NA – Not Applicable for Oregon portion of Project.
[2] O – Other than one of the eight factors under OAR 345-021-0010(1)(b)(D).

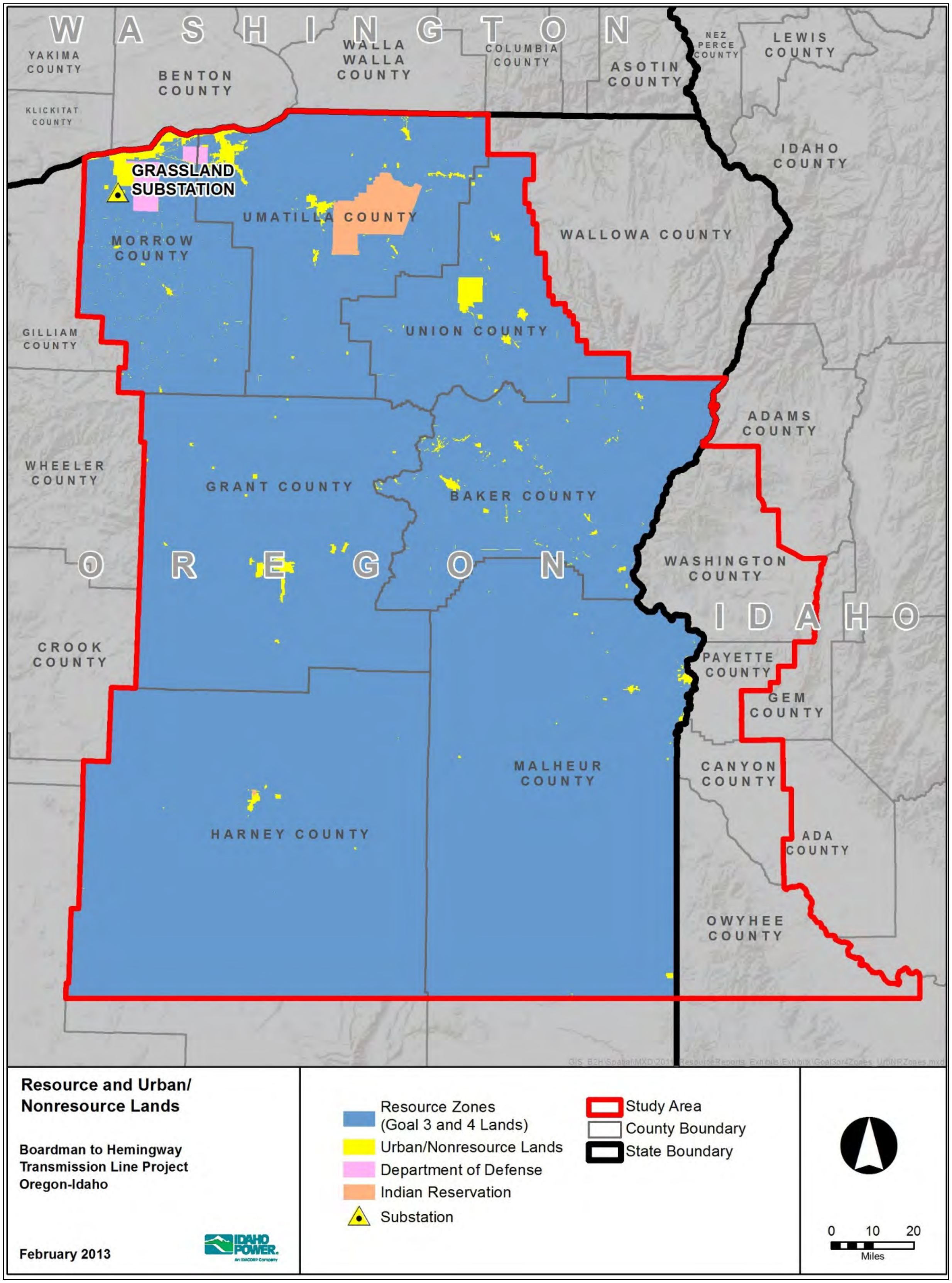


Figure B-4. Goal 3 and Goal 4 Resource Land within the Study Area in Oregon

3.1.1.2 Opportunities

IPC defined “opportunities” as resources or conditions that can accommodate transmission line construction and operation because of their physical characteristics or regulatory designations. In the study area, the most extensive opportunities are existing transportation corridors (I-84), pipelines, electric transmission lines, and agency-designated energy corridors (see Table B-3). The Proposed Corridor parallels existing transmission lines where possible but maintains a 1,500-foot reliability separation distance, when possible. In evaluating corridor locations, consideration was also given to paralleling the Summer Lake to Midpoint 500-kV line as well as to the location of the West-wide Energy Corridor and BLM- and USFS-designated utility corridors.

Table B-3. Siting Opportunities

Opportunity	Potential OAR 345-021-0010(1)(b)(D) Siting Factor
Existing Corridors	
Vale District Utility Corridor	iii
West-wide Energy Corridor	iii
National Forest Utility Corridor	iii
Interstate 84	iii
500-kV Transmission Lines	iii
138/230-kV Transmission Lines	iii
Large Diameter Pipeline	iii

3.1.2 Corridor Selection Process – Phase One (2008–2010)

Phase One of IPC’s identification and analysis of potential alternate corridors was accomplished primarily between 2008 and 2010 and involved input from many local citizens residing throughout the 11-county, two-state study area. IPC’s originally proposed corridor was presented to the public during scoping meetings conducted by the BLM and EFSC in October 2008.[6] Because of the level of public interest, corridor suggestions, and opposition to the originally proposed corridor, IPC initiated a process to engage residents, property owners, business leaders, and local officials in siting the Project. Through this Community Advisory Process (CAP) described below, IPC partnered with communities and other stakeholders from northeast Oregon to southwest Idaho to identify proposed and alternate corridors and substation locations for the Project.

IPC’s CAP took place in 2009 and early 2010. Project Advisory Teams (PATs) representing five geographic areas were convened for the purpose of identifying, developing, and recommending proposed and alternative corridors for the Project. Figure B-5 shows the process graphically.

[6] IPC first submitted a Notice of Intent (NOI) to apply for a site certificate to the ODOE – EFSC in 2008. IPC also submitted applications for the necessary federal right-of-ways to the BLM and the USFS, and the federal and state agencies held joint public scoping meetings in October 2008. Following those meetings, IPC initiated a process to re-evaluate the 2008 proposed route and engage residents, property owners, business leaders, and local officials in siting the transmission line. Through the CAP, IPC partnered with communities from northeast Oregon to southwest Idaho to identify potential routes for the Project. Based on input received in the CAP, IPC selected a new proposed route for the Project. Accordingly, IPC withdrew its original NOI and submitted a new NOI to ODOE-EFSC in July 2010, as well as revised applications to the BLM, USFS, and Bureau of Reclamation requesting the necessary ROW grants. BLM is currently preparing an Environmental Impact Statement for the Project under the National Environmental Policy Act (NEPA).

Figure B-5. Community Advisory Process

The process consists of the following steps:

1. PATs identified issues and concerns. PATs developed community criteria for evaluating possible corridors and integrated these with regulatory requirements and IPC criteria relating to cost and feasibility.
2. PATs developed a range of possible corridors or corridor segments that addressed community issues and concerns. The PATs developed approximately 48 corridors and corridor segments. Corridors not meeting the community, regulatory or IPC cost/feasibility criteria were removed from further consideration.
3. PATs recommended proposed and alternative corridors were evaluated. IPC analyzed all 48 corridors and corridor segments proposed by the PATs using the processes described in Section 3.1.2.3, and identified three corridors as most constructible, least difficult to permit, and most likely to incur the lowest overall cost.
4. IPC evaluated the three possible corridors based on input received from PATs and selected a proposed corridor. IPC presented three corridors to the PATs for their comments. The resulting comments showed no clear preference for any one of the three corridors. IPC selected the Eastern Corridor as the proposed corridor as described in Section 3.1.2.4.
5. Follow through with communities during state and federal reviews. IPC continues communicating with the PATs and public throughout the National Environmental Policy Act of 1972 (NEPA) and EFSC processes. Toward this end, IPC will keep the public and PATs updated on corridor revisions and the rationale for them as well as the status of the regulatory actions, and will continue to receive and address public input.

In addition to PAT meetings, IPC held public meetings throughout the Project area to allow the public to review and comment on the PATs' work and further comment on the Project itself.

3.1.2.1 Initial Corridor Selection

IPC compiled a comprehensive geographic information system (GIS) database of constraints and opportunities for the study area. Constraints were then categorized by PATs as exclusion, high avoidance, moderate avoidance, or low avoidance; incorporating input from the PATs, corridor development began with a series of routing meetings and workshops at Baker City, Boardman, and Ontario, Oregon, each of which comprised one evening session followed by a full day of routing. At the evening sessions, IPC educated the participants on the siting process and confirmed community criteria. The next day, individuals and groups of local citizens returned to identify corridor segments or entire corridors between Boardman and Hemingway. Other than providing technical expertise, IPC staff and their contractors did not participate in development of the PAT-derived corridors.

Members of the CAP and other local residents and organizations brought their knowledge of local resources, conditions, and priorities and worked with IPC, GIS analysts and routing experts to identify potential corridors. The GIS analysts, using topographic maps, available aerial photography, and the many GIS layers of constraints and opportunities, worked with participants to identify corridors that avoided exclusion areas and as much as possible minimized crossings of high avoidance constraints and, where practical, moderate and low avoidance areas. In all instances the routing teams were looking for opportunities such as existing transmission lines and the West-wide Energy corridors to parallel or use.

After PATs identified corridors for study in Grant and Harney counties, IPC initiated a formal CAP process and routing sessions were soon held in Mt. Vernon and Hines. Every corridor developed in the five mapping sessions was documented in GIS format and with a form explaining the basis for each corridor or segment. Approximately 47 corridors and corridor segments totaling over 3,000 miles (as shown on Figure B-6) were developed through the CAP.

3.1.2.2 Corridor Refinement

Following the routing sessions, IPC reviewed each of the corridors to identify potential issues that could significantly impact the ability to permit a segment or corridor. Each alignment was reviewed using aerial photography, topographic maps, and constraint data. Using aerial photography, houses, barns, and other structures (i.e., wind turbines); irrigation pivots; and other land use constraints could be avoided where practical. Using topographic maps the corridors were adjusted to avoid or minimize distance across very steep slopes and other physical features less desirable for construction and operation of a transmission line. Finally, the corridors were checked against constraint maps to avoid exclusion areas and areas of high permitting difficulty like Oregon Department of Fish and Wildlife (ODFW) Category 1 habitat. In the large majority of instances, changes were made while maintaining the intent of the corridor or corridor segment.

At this time a number of corridors were dropped from further consideration because they did not meet the Project purpose and need and/or resulted in significantly more environmental impacts and cost. As a result, the miles of corridors for further consideration were reduced to about 2,000 miles. Figure B-7 shows those corridors carried forward as a result of the refinement process.

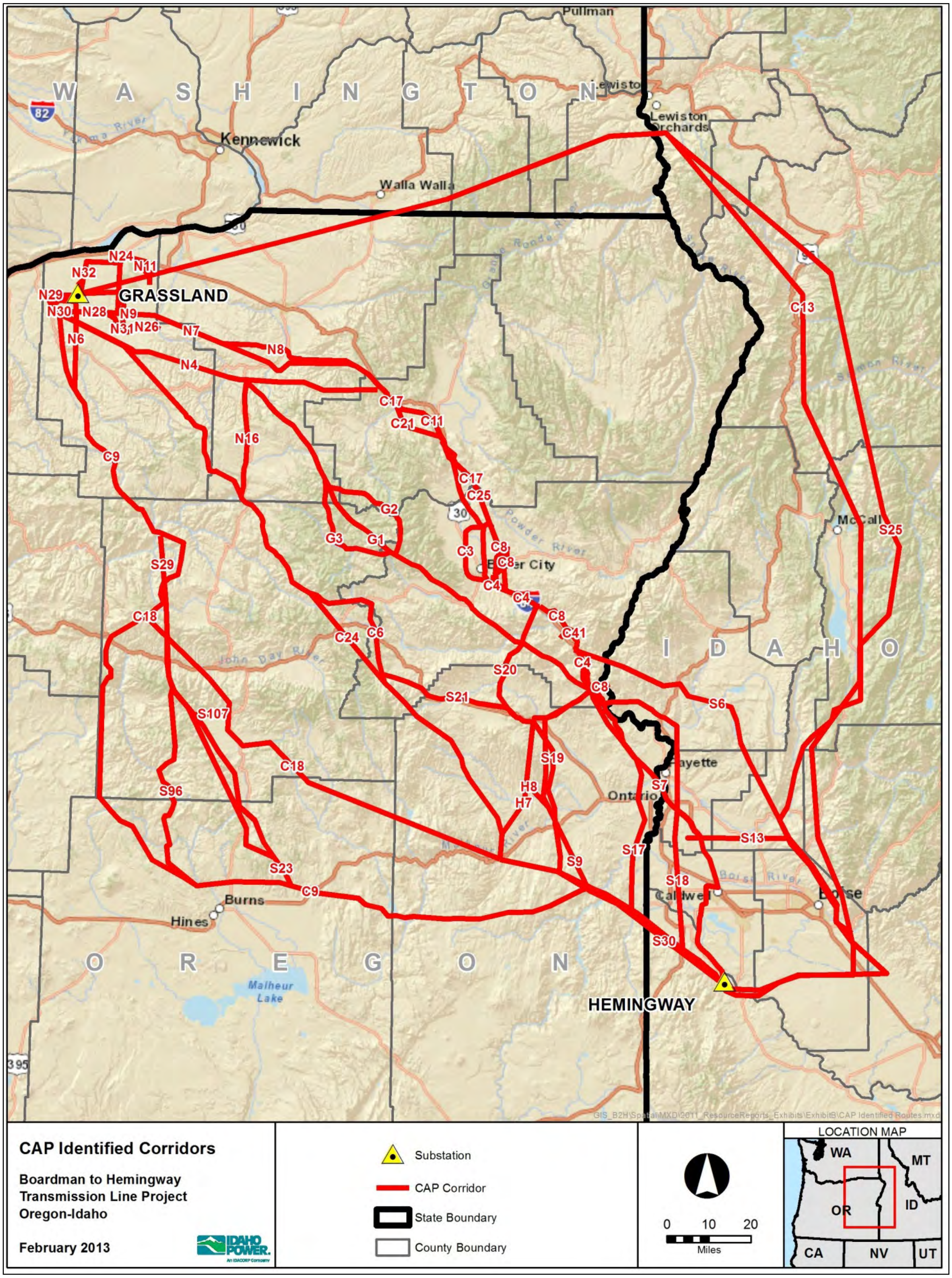


Figure B-6. Initial CAP Identified Corridors

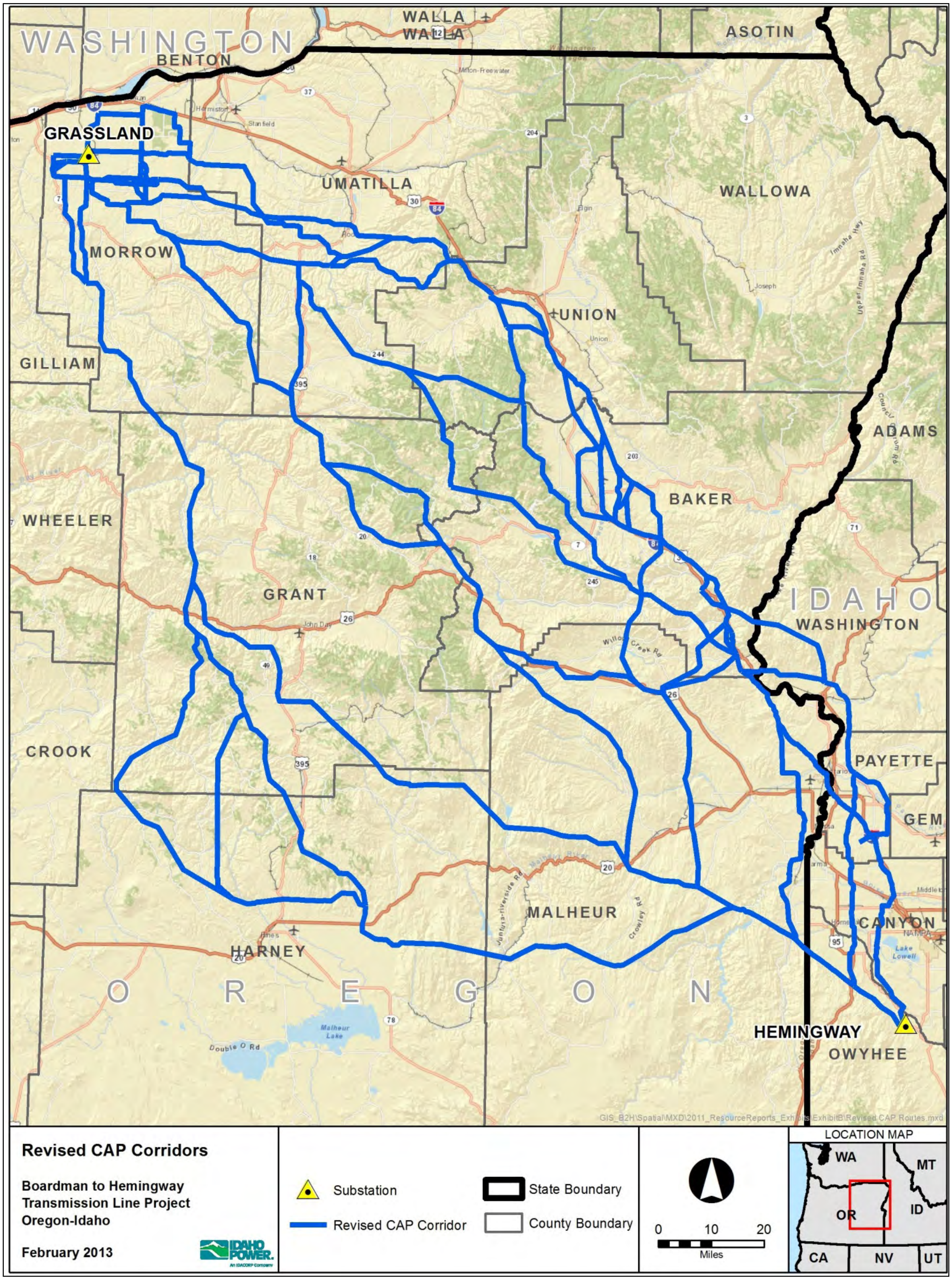


Figure B-7. Revised CAP Corridors

3.1.2.3 Regional Analysis

Next, the remaining corridors, where appropriate, were grouped into 14 regions as shown on Figure B-8. Regions were established where two or more corridors extended from one common point to a second common point. For example, in the southwest region, as shown on Figure B-9, four corridors were identified between points GR3 and MA6. Each corridor in this region was then analyzed for permitting difficulty, construction difficulty, and mitigation costs as shown on Figure B-10.

In evaluating permitting difficulty, constraints previously identified were categorized as low, moderate, or high permitting difficulty areas or as exclusion areas or opportunities. Next, the miles of each category were measured and totaled and used to compare pairs of corridors within a region. Also, each corridor was analyzed for specific constraints it crossed and these were documented in attribute tables. The tables were reviewed to identify more significant differences between corridors. These two analyses were used to determine the most reasonable corridor in each region.

In evaluating construction difficulty, accessibility, topography, road construction, equipment movement, and many other factors were used to determine low, moderate, and high construction difficulty. Again, these ratings were measured by mile and totaled and used to compare the corridors in a region. In those cases where the permitting analysis was not conclusive, the construction difficulty analysis was considered.

After the permitting and construction difficulty analyses were completed, potential biological mitigation costs were estimated (high, moderate, or low), measured in miles, and totaled for each alternative corridor. Using these three analyses, including the siting factors identified in OAR 345-021-0010(1)(b)(D), a more reasonable corridor was selected for each region and, combining the selected corridors with those unique segments between two points, three corridors were determined for further analysis as shown on Figure B-11.

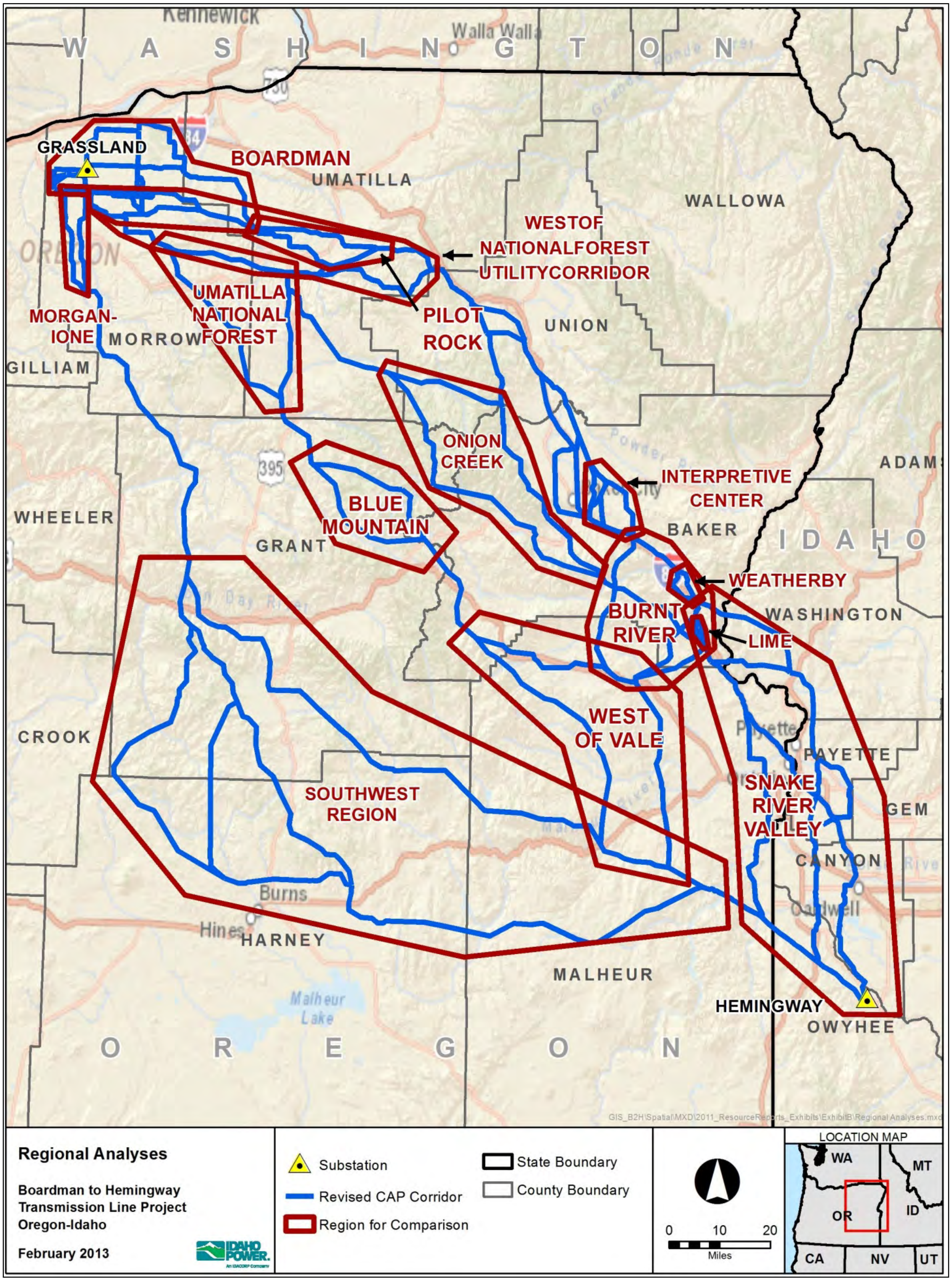


Figure B-8. Regional Analyses

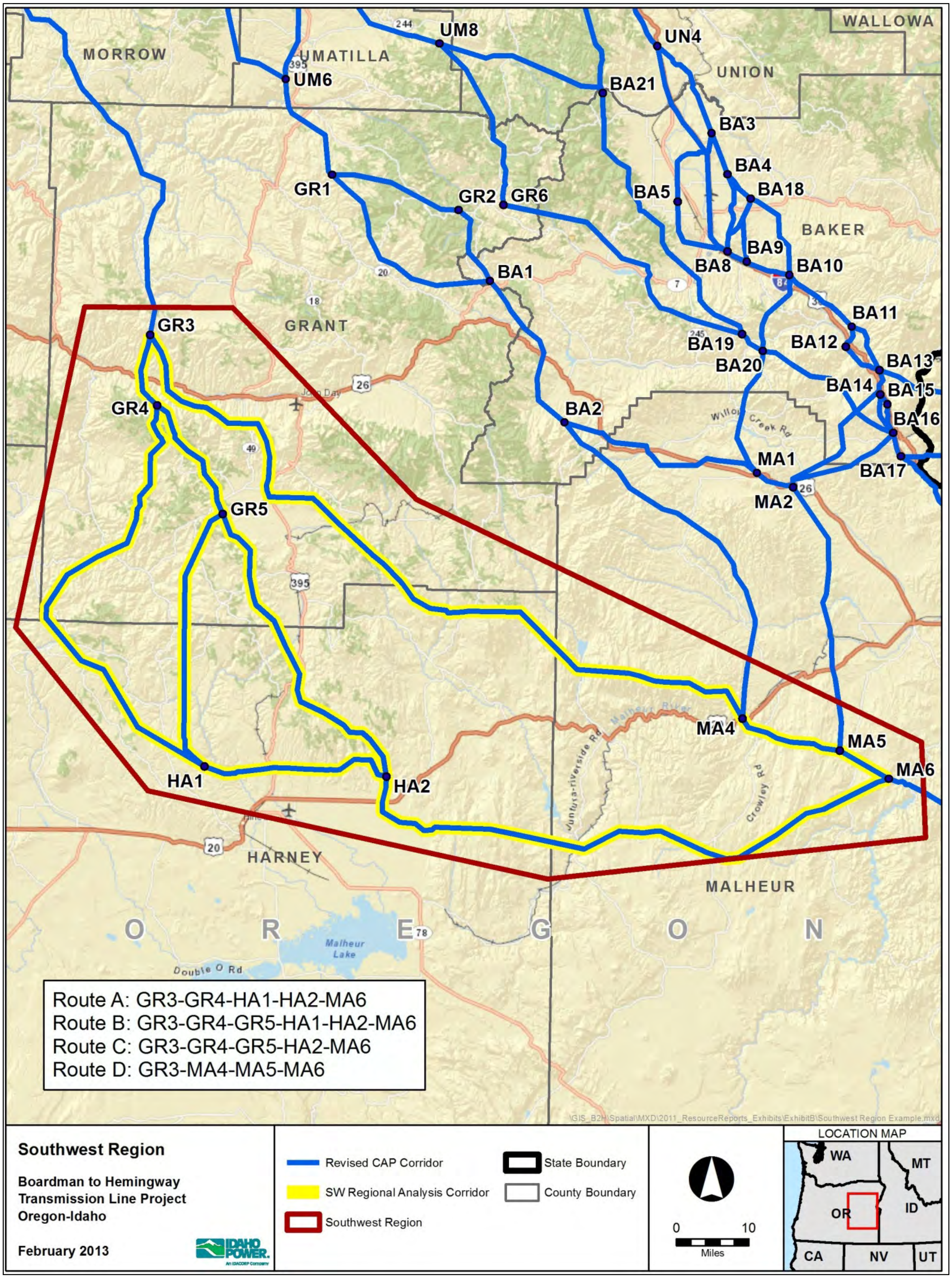


Figure B-9. Southwest Region Analysis

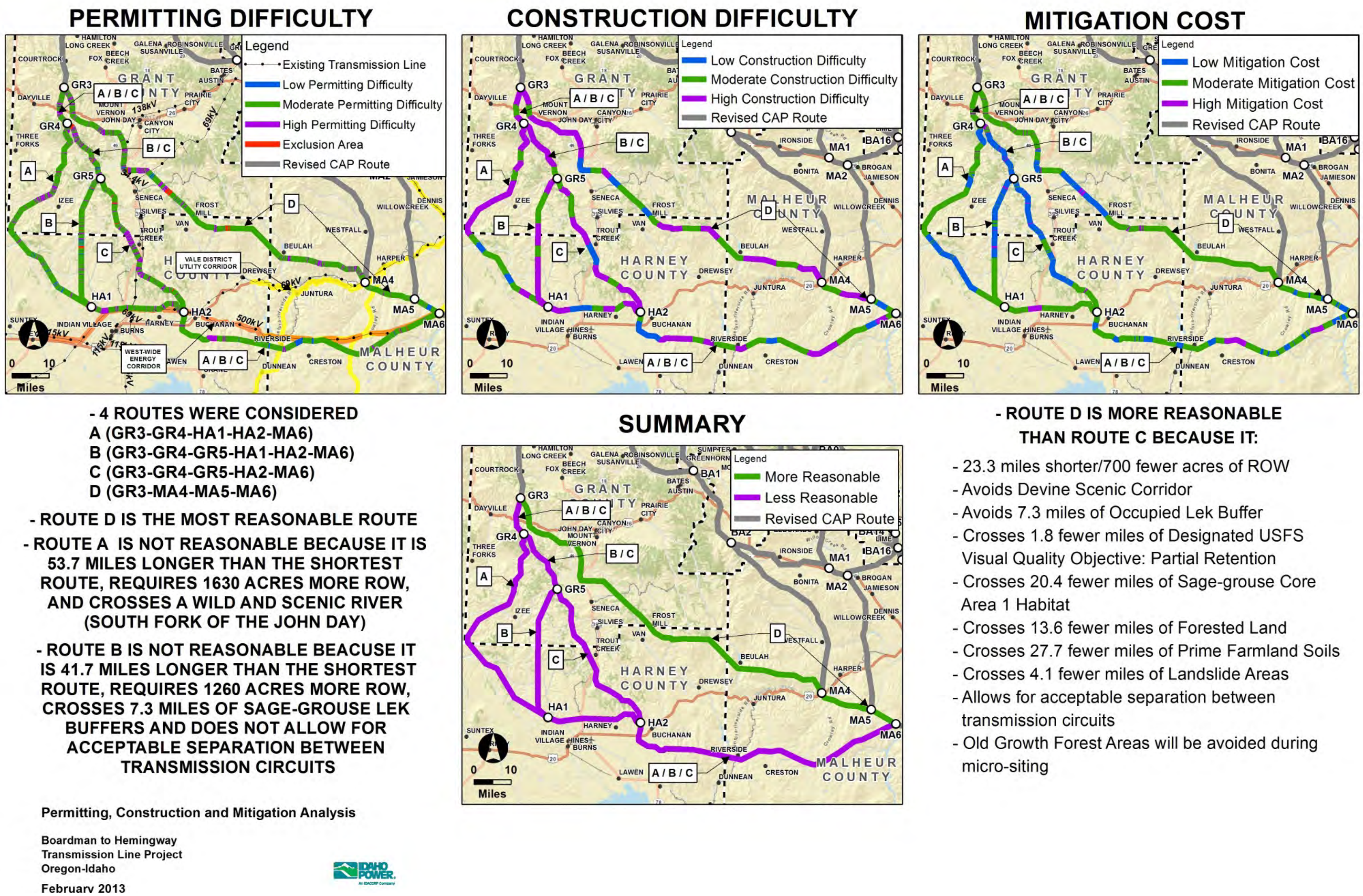


Figure B-10. Permitting, Construction, and Mitigation Analysis

Figure B-11. Alternative Corridors

3.1.2.4 Analysis of Three Alternative Corridors

As shown on Figure B-11, IPC identified three alternative corridors—Eastern, Central, and Western—for additional analysis. Table B-4 provides a high level comparison of each corridor for key factors. Attachment B-3 is an excerpt from IPC's Siting Study that includes tables comparing the impacts of the three corridors on various resources crossed based on level of importance assigned to the resource and which of the eight factors under OAR 345-021-0010(1)(b)(D) relate to that resource.

Table B-4. Summary Corridor Comparisons

Factors	Western Corridor	Central Corridor	Eastern Corridor
Land Use Characteristics			
Length/Counties Traversed	275/5	282/6	299/6
Private Land	138 miles (50%)	172 miles (61%)	206 miles (69%)
Public Land	137 miles (50%)	110 miles (39%)	93 miles (31%)
Follows Existing Corridors	46 miles	58 miles	111 miles
EFU-Zoned Land [1]	184.8 miles	242.2 miles	260.6 miles
New ROW	229 miles	224 miles	188 miles
Resources			
Irrigated Cropland	10 miles	9 miles	22 miles
Forest Clearing	1,754 acres	1,763 acres	681 acres
Rugged Terrain (> 25% slopes)	59 miles	56 miles	35 miles
Special Status Streams	46 crossings	13 crossings	8 crossings
Restrictive USFS/BLM Visual Classes	9.1 miles	25.5 miles	8.6 miles
Community Concerns			
Significant Issues	Community concerns and visual impacts in the John Day Valley and Journey Through Time Scenic Byway	Developing areas on the west side of the Baker Valley	Proximity to the National Historic Oregon Trail Interpretive Center
National Forests	Malheur and Umatilla (45 miles) new corridor	Wallowa-Whitman (30 miles) new corridor	Wallowa-Whitman but in a designated utility corridor (5 miles)
High Construction Difficulty	117.1 miles	99.3 miles	65.3 miles

[1] For purposes of calculating mileage in this table, the EFU zones include all lands designated by counties as either a qualifying EFU zone or a hybrid agriculture/forest zone. Note that the miles of impact on EFU-zoned land differ from those presented in IPC's siting studies because when IPC prepared its siting studies, it understood EFU zones to be only those EFU zones expressly identified as EFU in county GIS data or by county planners. IPC subsequently learned of additional agricultural zones and hybrid zones that are qualifying Goal 3 EFU zones. For this reason, the miles of impact to EFU lands shown in this table differ from those shown in Attachment B-3 (excerpt from the Siting Study).

Western Corridor—The Western Corridor exits the proposed Grassland Substation to the south, heads west for about 6 miles, and then turns south crossing the western part of Morrow County, continuing southwest across Grant, Harney, Malheur, and Owyhee counties to the Hemingway Substation. As shown on Table B-4, of the three remaining corridors the Western Corridor is the shortest by about 7 to 24 miles and crosses the least private and most public land: however, it parallels the least amount of existing utility and transportation corridors (46 miles) and will require the most new ROW (229 miles).

Although the shortest alternative, the Western Corridor crosses about 117.1 miles of what has been determined to be high difficulty construction conditions, about 51.8 miles and 17.8 miles more than the Eastern and Central Alternative Corridors. In terms of permitting difficulty compared to the Central and Eastern Corridors, this corridor requires the most miles of new corridor, parallels the least amount of utility corridors, crosses more than 30 special status streams, requires over 1,750 acres of clearing, and crosses about 45 miles of the Malheur and Umatilla national forests.

Central Corridor—The Central Corridor also exits the proposed Grassland Substation to the west and then south. However, as this corridor passes to the south of the Grasslands Conservation area, it angles to the east crossing Morrow and Umatilla counties, passing through the designated utility corridor in the Wallowa-Whitman National Forest. This corridor then turns southeast through Union County and along the west side of the Baker Valley in Baker County. It continues southeast through Malheur and Owyhee counties into the new Hemingway Substation.

The Central Corridor is about 7 miles longer than the Western Corridor and approximately 17 miles shorter than the Eastern Corridor. It parallels more existing utility corridor than the Western Corridor but 53 miles less than the Eastern Corridor and it requires 5 miles less new corridor than the Western Corridor and 36 more miles than the Eastern Corridor.

The Central Corridor crosses 56 miles of slopes greater than 25 percent and will require clearing of approximately 1,763 acres which is slightly more than the Western Corridor and significantly more than the Eastern Corridor. The evaluation of construction difficulty shows that the Central Corridor traverses 17.8 fewer miles of high construction difficulty than the Western Corridor and 34 more miles than the Eastern Corridor. Much of the high construction difficulty area is located along the west side of the Baker Valley.

Significant permitting concerns include 65 miles of high permitting difficulty (more than the Eastern or Western Corridors), the 30 miles through the Wallowa-Whitman National Forest, potential visibility of the line on the west side of Baker Valley, 224 miles of new corridor, and about 1,760 acres of clearing.

Eastern Corridor—The Eastern Corridor is similar to the Central Corridor except that it exits the proposed Grassland Substation to the north and east around the Boardman Bombing Range and then proceeds southward. It joins the Central Corridor just east of the Morrow County/Umatilla County line, and the two corridors continue together to the southeast end of the Wallowa-Whitman utility corridor in Union County. At this point, the Eastern Corridor proceeds to the southeast across Union County and then into Baker County following the east side of Baker Valley. The Eastern Corridor rejoins the Central Corridor in northern Malheur County and then continues generally southeast across this county and Owyhee County to Hemingway Substation.

Although this corridor is about 17 miles longer than the Central Corridor and about 24 miles longer than the Western Corridor, it requires significantly less new corridor and parallels significantly more existing utility corridor. This corridor also crosses more than 20 fewer miles of slopes over 25 percent, requires over 1,000 less acres of clearing, and has 33 to 55 fewer miles designated as high construction difficulty.

The Eastern Corridor has the least miles designated high permitting difficulty and avoids creating a new utility corridor through one or more National Forests. An important potential permitting issue for this corridor is related to crossing the Oregon NHT and the proximity to the National Historic Oregon Trail Interpretive Center.

As a result of the analysis described above, IPC selected the Eastern Corridor as the basis for its Proposed Corridor.[7] When compared to the Central and Western corridors, the Eastern Corridor:

- Would require over 35 fewer miles of new corridor,
- Would parallel existing utility corridors for over 50 miles more,
- Would require over 1,000 fewer acres of clearing,
- Would be significantly less difficult to construct, and
- Would avoid creating a new 30- to 45-mile utility corridor through one or more National Forests.

While it would avoid new impacts on rugged forest lands, the Eastern Corridor would cross approximately 75.8 more miles of EFU-zoned land than the Western Corridor, and 18.4 more miles than the Central Corridor. Compared to the Central Corridor, the Eastern Corridor would cross 33.1 fewer miles designated as high construction difficulty and 21.1 fewer miles designated high permitting difficulty and it would not require plan amendment to designate a utility corridor in the Wallowa-Whitman National Forest. The Western Corridor would have a similar degree of permitting difficulty as the Eastern Corridor, but would have required plan amendments for utility corridors crossing the Malheur and Wallowa-Whitman National Forests. The Western Corridor would also traverse 55.1 more miles designated high construction difficulty.

Table B-5 compares each corridor across all resource factors listed in Attachment B-3. The total of OAR 345-021-0010(1)(b)(D) factors encountered are categorized as more, less, or least reasonable when the corridors are compared to each other. In other words, the Eastern Corridor was the best corridor for avoiding impacts to 38 resources, the second best for another 19 resources, and the least reasonable for 11 resources. The results indicate an overall lower potential for resource impact for the Eastern Corridor. The results also clearly indicate that there was no single corridor that was the best choice for *all* of the resources; as contemplated by OAR 345-021-0010(1)(b)(D), IPC carefully considered and evaluated each corridor against the eight factors and selected the Eastern Corridor as the basis for the Proposed Corridor.

Table B-5. Comparison of OAR 345-021-0010(1)(b)(D) Factors by Corridor

Resource Factor Encounters	Western Corridor	Central Corridor	Eastern Corridor
More Reasonable	32	25	38
Less Reasonable	32	26	19
Least reasonable	13	11	11
No encounter	12	27	21
Total Resource Factors	**89**	**89**	**89**

[7] The Proposed Corridor differs from the Eastern Corridor in that IPC ultimately selected the central approach to the Grassland Substation as its proposed route into the Boardman area (instead of a route north of the Bombing Range).

Using the factors presented Tables B-4 and B-5, the Eastern Corridor was selected as the Proposed Corridor with the understanding that additional micrositing would be necessary to avoid and reduce potential impacts. The additional siting work that has been done since 2010 is described Section 3.1.3 and in further detail in the Supplemental Siting Study (Attachment B-2).

3.1.3 Corridor Selection Process Phase Two – September 2010 to Present

Having selected a Proposed Corridor for the Project, IPC submitted its Notice of Intent to apply for a Site Certificate for the Project in July 2010. ODOE held public informational meetings regarding IPC's Proposed Corridor in August 2010, and IPC published a Siting Study detailing the first phase of its Corridor Selection Process in August 2010 (Attachment B-1).

Since IPC's submittal of its July 2010 Notice of Intent (NOI) and the 2010 Siting Study (Attachment B-1), IPC has engaged in extensive discussions with landowners in an attempt to accommodate requests for corridor adjustments. IPC has also performed more detailed engineering and constructability analyses that have suggested corridor adjustments and changes. In addition, in coordination with PGE and BPA, IPC identified alternatives to the northern terminus of the Project. Finally, IPC has proposed to remove approximately 4.8 miles of existing 138-kV line and build approximately 4.1 miles of 500-kV line on this ROW. In order to do this, IPC will rebuild approximately 5.0 miles of single-circuit 69-kV transmission line onto double-circuit 138/69-kV structures within the existing 69-kV ROW. An additional 0.3 mile of new 138-kV single circuit transmission line will be built to tie the 138-kV part of the double-circuit line back to the existing 138-kV line.

These steps have resulted in over 48 adjustments of the Proposed Corridor and alternate corridor segments, as well as identification of two alternative substation locations. OAR 345-021-0010(1)(b)(D) requires IPC to discuss reasons for selecting corridors not presented at the informational meetings described in OAR 345-015-0130. Table B-6 identifies changes and new or revised corridors that have been developed since the informational meetings. Table B-6 also lists the reasons for these changes and their relationship to the eight siting factors identified in OAR 345-021-0010(1)(b)(D) (see additional discussion in Section 3.1.4) (see also Attachment B-2, Appendix C for associated maps). The process leading to the selection of the revised Proposed Corridor and seven alternate corridor segments for portions of the Proposed Corridor is described in the Supplemental Siting Study included here as Attachment B-2. Exhibit K, Sections 3 and 4 describe the alternatives analysis required by ORS 215.275(2) in micrositing the Proposed Corridor and alternate corridor segments.

Table B-6. Proposed and Alternate Corridor Adjustments since Informational Meetings

Map Label ID	Map Number Reference from Attachment B-2, Appendix C	Approximate Milepost (MP) Location relative to June 2012 Proposed and Alternate Corridors	IPC Corridor Change Description	IPC Basis for Corridor Change	Potential OAR 345-021-0010(1)(b)(D) Siting Factor
1	Map 1	Grassland Substation – Proposed Corridor MP 8	Proposed Corridor shifted north to follow Boardman to Slatt Existing Line	Avoids crossing north edge of The Nature Conservancy Grassland Preserve with Washington Ground Squirrel (WAGS) colonies	ii
2	Map 1	Proposed Corridor MP 6.8	Added Horn Butte Substation as potential Project termination and interconnection to Boardman to Slatt existing transmission line	Shortens overall length of transmission line and avoids WAGS colonies	ii
3	Map 1	Proposed Corridor MP 6.8 –34.1	Added Horn Butte Alternate	Connect to Alternate Substation	NA
4	Map 1	Proposed Corridor MP 12-18	Shifted Proposed Corridor to stay closer to Boardman Grasslands Preserve	Adjusted corridor per landowner discussion	ii
5	Map 1	Proposed Corridor MP 20-23	Shifted Proposed Corridor to stay on Property Boundary	Adjusted corridor per landowner discussion	NA
6	Map 1	Proposed Corridor MP 33.5-39	Proposed Corridor Centerline Adjustment	Landowner request to shift around proposed wind turbines	NA
7	Map 1-2	Proposed Corridor MP 39-43	Proposed Corridor Centerline Adjustment	Avoid pivot irrigation; property line offset adjustments; maximize structure offset distances, tower spotting analysis/engineering assessment to improve constructability	NA
8	Map 1-2	Grassland Substation - Proposed Corridor MP 56.5	Eliminated Segment of July 2010 NOI Proposed Corridor (Northern Approach to Grassland Substation)	2011 surveys identified potential WAGS colonies (Category 1 habitat); alternative Longhorn Substation would preclude need to have a northern corridor to the proposed Grassland Substation	ii

Table B-6. Proposed and Alternate Corridor Adjustments since Informational Meetings (continued)

Map Label ID	Map Number Reference from Attachment B-2, Appendix C	Approximate Milepost Location relative to June 2012 Proposed and Alternate Corridors	IPC Corridor Change Description	IPC Basis for Corridor Change	Potential OAR 345-021-0010(1)(b)(D) Siting Factor
9	Map 1	Longhorn Alternate MP 0	Added Longhorn Substation as potential Project termination and interconnection to Slatt to McNary existing transmission line	Alternative Longhorn Substation would preclude need to have a northern corridor to the proposed Grassland Substation	NA
10	Map 1	Longhorn Alternate MP 0-18.4	Added Longhorn Alternate	Connect to Alternative Substation	NA
11	Map 2	Proposed Corridor MP 44-50	Proposed Corridor Centerline Adjustment	Engineering assessment to improve constructability	vii
12	Map 2	Proposed Corridor MP 51-56.5	Shifted Proposed Corridor to stay on north side of Slusher Canyon	Avoids crossing Slusher Canyon twice and stream crossings	i and vii
13	Map 2	Proposed Corridor MP 63-67	Proposed Corridor Centerline Adjustment	Engineering assessment to improve constructability	vii
14	Map 2	Proposed Corridor MP 68-70	Proposed Corridor Centerline Adjustment	Engineering assessment to improve constructability	vii
15	Map 2	Proposed Corridor MP 74-76	Proposed Corridor Centerline Adjustment	Engineering assessment to improve constructability	vii
16	Map 2-3	Proposed Corridor MP 78-85	Shifted Proposed Corridor South	Landowner request to avoid homes, avoids difficult terrain, less access roads, avoids access off of Indian Reservation	vii
17	Map 3	Proposed Corridor MP 86-91	Shifted Proposed Corridor North	Adjusted to avoid canyon crossings	vii
18	Map 3	Proposed Corridor MP 93-96.5	Proposed Corridor Centerline Adjustment	Better use of existing access roads, engineering assessment to improve constructability	vii
19	Map 3	Proposed Corridor MP 100-103	Proposed Corridor Centerline Adjustment	Avoid State Park, engineering assessment to improve tower locations	v

Table B-6. Proposed and Alternate Corridor Adjustments since Informational Meetings (continued)

Map Label ID	Map Number Reference from Attachment B-2, Appendix C	Approximate Milepost Location relative to June 2012 Proposed and Alternate Corridors	IPC Corridor Change Description	IPC Basis for Corridor Change	Potential OAR 345-021-0010(1)(b)(D) Siting Factor
20	Map 3	Proposed Corridor MP 106-108.5	Proposed Corridor Centerline Adjustment	Adjust alignment to follow WECC offset criteria from existing lines	iii
21	Map 3	Proposed Corridor MP 109-116	Proposed Corridor shifted east ~3 miles	Adjusted line corridor to follow existing BPA line corridor and utilize existing access roads per landowner request, avoid adding access roads in timbered areas	iii
22	Map 3-4	Glass Hill MP 5 – Proposed MP 124	Eliminated portion of Glass Hill Alternate	Difficult terrain forced alternative to tie back into Proposed Corridor at earlier point	vii
23	Map 3-4	Proposed Corridor MP 116-126	Shifted Proposed Corridor Southwest	Avoid Oregon State University Research Forest, adjusted per landowner discussions, difficult terrain, engineering assessment to improve constructability	vii
24	Map 4	Proposed Corridor MP 126-130	Eliminated Clover Creek Valley Alternate	No environmental advantage to alternative which also requires 2 crossings of existing 230-kV line	NA
25	Map 4	Proposed Corridor MP 127-128	Proposed Corridor Centerline Adjustment	Avoid crossing ODOT gravel pit/blasting area	NA
26	Map 4	Proposed Corridor MP 130-134	Shifted Proposed Corridor North	landowner request to shift alignment to avoid potential new structure location	NA
27	Map 5	Proposed Corridor MP 151-152	Proposed Corridor Centerline Adjustment	Avoid crossing occupied Sage-grouse lek 2-mile buffers	ii
28	Map 5	Proposed Corridor MP 154-157	Shifted Proposed Corridor East	Adjusted corridor to reduce visibility from NHOTIC	vi
29	Map 5	Proposed Corridor MP 154-170	Eliminated Virtue Flat Alternate	Alternative could not be sited to avoid occupied Sage-grouse lek 2-mile buffers in effect at time of elimination	ii

Table B-6. Proposed and Alternate Corridor Adjustments since Informational Meetings (continued)

Map Label ID	Map Number Reference from Attachment B-2, Appendix C	Approximate Milepost Location relative to June 2012 Proposed and Alternate Corridors	IPC Corridor Change Description	IPC Basis for Corridor Change	Potential OAR 345-021-0010(1)(b)(D) Siting Factor
30	Map 5	Proposed Corridor MP 158.5-164	Proposed Corridor Centerline Adjustment	Engineering assessment to improve constructability	vii
31	Map 5	Proposed Corridor MP 165-168	Proposed Corridor Centerline Adjustment	Improve crossing of 69kV and better utilize existing 138-kV corridor	iii
32	Map 5-6	Proposed Corridor MP 168-170	Shifted Proposed Corridor South	Landowner request to shift alignment farther from existing residence	NA
33	Map 6	Proposed Corridor MP 180-183	Proposed Corridor Centerline Adjustment	Adjusted per landowner discussion concerning avoidance of natural amphitheater	NA
34	Map 6	Proposed Corridor MP 186-187.5	Proposed Corridor Centerline Adjustment	Adjusted corridor per landowner discussion	NA
35	Map 6	Proposed Corridor MP 186-191	Eliminated Weatherby Alternate	Difficult terrain, Proposed 138/69-kV Rebuild a better option	iii and vii
36	Map 6	Proposed Corridor MP 188-193	Added Proposed Double Circuit 138/69-kV Rebuild. 500-kV line to be built within existing 138-kV ROW; existing 138-kV and 69-kV lines to be rebuilt as double circuit structures in existing 69-kV ROW	Difficult terrain	vii
37	Map 7	Proposed Corridor MP 205.5-216	Shifted Proposed Corridor North and West	Avoid crossing occupied Sage-grouse lek 2-mile buffers, adjusted per landowner discussions, engineering assessment to improve constructability across canyon	ii and vii
38	Map 7-8	Proposed Corridor MP 216-229.5	Shifted Proposed Corridor West	Avoid crossing occupied sage-grouse lek 2-mile buffer identified in 2011 survey season	ii
39	Map 7-8	Proposed Corridor MP 199.5-229.5	Added Willow Creek Alternate	Avoid crossing occupied Trail Gulch sage-grouse lek 2-mile buffer	ii

Table B-6. Proposed and Alternate Corridor Adjustments since Informational Meetings (continued)

Map Label ID	Map Number Reference from Attachment B-2, Appendix C	Approximate Milepost Location relative to June 2012 Proposed and Alternate Corridors	IPC Corridor Change Description	IPC Basis for Corridor Change	Potential OAR 345-021-0010(1)(b)(D) Siting Factor
40	Map 8	Proposed Corridor MP 233-238	Shifted Proposed Corridor West	Engineering assessment to improve constructability	vii
41	Map 8	Proposed Corridor MP 238-240	Proposed Corridor Realignment across Malheur River	Avoid cultural resources and golden eagle nest found during 2011 surveys	vi
42	Map 8-9	Proposed Corridor MP 240-273	Shifted Proposed Corridor East	Avoid areas inventoried as having wilderness characteristics, avoid ACEC, follow Vale District Utility Corridor	iii and v
43	Map 8-9	Proposed Corridor MP 243-272	Added Malheur S Alternative	Avoid areas inventoried as having wilderness characteristics, minimizes ACEC crossing	v
44	Map 8-9	Proposed MP 245-252	Added Double Mountain Alternative	Avoid private land/stay on BLM-managed land	NA
45	Map 9	South of Malheur S Alternate MP 18-23	Eliminated Owyhee River Below Dam Alternative	Relocation of Proposed Corridor – no need for alternative	NA
46	Map 10	Proposed Corridor MP 275-277	Shifted Proposed Corridor South	Avoid crossing EFU-zoned land	viii
47	Map 10	Proposed Corridor MP 281-285	Shifted Proposed Corridor South	Avoid private land, follow WECC offset criteria from existing lines	iii
48	Map 10	Proposed Corridor MP 286-289.5	Shifted Proposed Corridor North	Idaho Department of Lands request to reduce offset to existing 500-kV line	iii

3.1.4 Analysis of Factors from OAR 345-021-0010(1)(b)(D)(i)-(viii)

As described in earlier sections of this Exhibit, the corridor selection process to move from a two-state, 11-county study area comprising over 31,000 square miles to 3,000 miles of preliminary corridors to selection of a Proposed Corridor and seven alternate corridor segments was a complex process with extensive public input. From the beginning of the process, IPC has employed the eight factors identified in OAR 345-021-0010(1)(b)(D) to filter through the various alternates at an increasing level of detail. In the initial phase, more than 225 constraints to, and opportunities for, siting were identified including 124 that were directly related to the eight factors discussed below (see Tables B-2 and B-3). Using these constraints and opportunities and working with the local citizens, over 3,000 miles of alternate corridor were identified for further analysis.

Each alternate was again reviewed to improve the ability to permit and construct each corridor and corridor segment. Again the eight factors were applied to refine the corridors. In particular, IPC used aerial photography to identify and avoid, where practicial, irrigation pivots, houses, barns, private runways, other structures (i.e., wind turbines), and land use features. The corridors were adjusted using topographic maps to avoid or minimize distance across very steep slopes and other physical features (factor vii) less desirable for transmission line construction and operation. Finally, the corridors were again checked against the constraint and opportunity GIS database to avoid, where possible, exclusion areas and areas of high permitting difficulty such as potential ODFW Category 1 habitats (factor ii). As a result of this analysis, the miles of alternate corridor still under consideration were reduced to about 2,000 miles.

The alternate corridors were then grouped into 14 regions (see Figure B-8) and evaluated on the basis of permitting difficulty, construction difficulty and mitigation costs (see example, Figure B-10). Using the constraint database, which included the eight siting factors, the alternates were reviewed to determine the most reasonable corridor within each region.

The most reasonable corridor segments from each region were combined to form three complete corridors spanning from the Grassland Substation to the Hemingway Substation. These three corridors were evaluated against the constraint database. This analysis resulted in a recommendation of the Eastern Corridor for reasons such as use of existing utility and transportation corridors for 50 additional miles (factor iii); crossing 20 fewer miles of 25 percent slopes (factor vii), and crossing 38 fewer special status streams (factor i).

Since IPC submitted its 2010 NOI, it has continued its routing process to further reduce potential impacts, eliminate some alternate corridor segments, and add several more substantial alternate corridor segments. These changes have occurred as a result of extensive field studies, environmental analysis to better define areas of impact and more detailed engineering studies to better define construction and operation requirements. As a result, alignments have been shifted and access roads and structure sites have been moved to avoid or reduce impacts to the resources, including those relevant to the eight factors. For instance, in the vicinity of the Grassland Substation expansion, the alignment of the Proposed Corridor was shifted to avoid potential Washington ground squirrel (WAGS) habitat.

This approach is consistent with the directive in OAR 345-021-0010(1)(b)(D), which requires IPC to consider eight siting factors while recognizing that the Project Order states that the alternatives analysis must be consistent with the six factor analysis required by ORS 275.215 and the required information in this rule. The Council recognizes that some of the factors compete with one another (for example, the requirements to both avoid habitat land and avoid farm land), but expects a demonstration that all required factors were considered. In this regard, the Proposed Corridor and corridor selection analysis described herein is consistent with both the six-factor analysis required by ORS 215.275 and the eight-factor analysis of OAR 345-021-0010(1)(b)(D).

As described below, IPC has carefully considered and weighed the eight factors in OAR 345-021-0010(1)(b)(D) at both the macro- and the micro-siting levels.

(i) Least disturbance to streams, rivers and wetlands during construction. IPC has designed the Project to avoid impacts to streams, rivers, and wetlands to the maximum extent practicable. Streams, rivers, and wetlands have been considered in the siting and evaluation process since the initiation of routing both at the macro- and micro-level. As shown in Attachment B-3, six different categories of Special Status streams and National Wetland Inventory wetlands were used in the evaluation of the Eastern, Central, and Western corridors.

The results show that the Eastern Corridor crosses 8 special streams and 0.7 mile of wetland, compared to 13 crossings and 0.7 mile for the Central Corridor, and 46 crossings and 0.4 mile for the Western Corridor. The information above shows that the Eastern Corridor would result in the least disturbance to these resources.

The corridor refinement process has continued with a detailed on-the-ground inventory of water resources, including wetlands, along the proposed and alternate corridors. This more accurate information is providing input to the avoidance and minimization measures incorporated into the design of the transmission line and all related and supporting facilities.

(ii) Least percentage of total length of pipeline or transmission line that would be located within areas of Habitat Category 1, as described by the Oregon Department of Fish and Wildlife. IPC designed the Project to avoid impacts to all known Category 1 habitat to the maximum extent practicable, and will continue to refine the Project as necessary to avoid impacts to newly-identified Category 1 habitat. Category 1 habitat as defined by ODFW has been an important factor in evaluating and routing alternate corridors at both the macro and micro levels from early on in the process. There are two species for which ODFW has identified Category 1 habitat in the Project area: the greater sage-grouse (sage-grouse) and the WAGS.

Potential WAGS habitat is focused around the northern end of the Project and is equally distributed along each of the corridors. ODFW defines Category 1 habitat for WAGS as 785-foot diameter buffer areas around a WAGS colony. This was not a siting criterion at the macro level, but an important consideration during micrositing.

Designing the Project to avoid impacts to Category 1 sage-grouse habitat has been extremely challenging, in large part because of the dynamic and evolving nature of Oregon's sage-grouse habitat protection policy. In selecting and finalizing its Proposed Corridor, IPC based its efforts to avoid Category 1 sage-grouse habitat on ODFW guidance that Category 1 sage-grouse habitat comprised all habitat within 2 miles of leks, unless site-specific habitat conditions, terrain, or existing man-made features potentially would reduce the category level. Consequently, the Proposed Corridor avoids most of the many 2-mile lek buffers in the Project vicinity.

In October 2012, IPC was advised that ODOE and ODFW determined that ODFW's core area approach to categorizing sage-grouse habitat must be applied to the Project, as set forth in the *Greater Sage-Grouse Conservation Assessment and Strategy for Oregon: A Plan to Maintain and Enhance Populations and Habitat* (ODFW 2011), referred to hereafter as the "2011 Strategy." Under the 2011 Strategy, ODFW has designated "core areas" of sage-grouse habitat. ODFW recommends that all mapped core areas be identified as Category 1 habitat, subject to site-specific analysis and possible recategorization as Category 2 based on actual habitat conditions (degraded habitat, existing infrastructure or other disturbances, etc.). As described in Exhibit P, IPC's Proposed Corridor does cross mapped core area. IPC is working with ODFW to determine the precise extent of Category 1 sage-grouse habitat within the Project Site Boundary, and will continue to make every effort to microsite the proposed and alternate corridors to achieve the least disturbance of potential Category 1 habitat. In 2011 and 2012, surveys of the proposed and alternate corridors were completed to update sage-grouse habitat data and locate WAGS colonies. More information on field surveys performed for the Project and Category 1 habitat is provided in Exhibit P.

(iii) Greatest percentage of the total length of the transmission line that would be located within or adjacent to public roads, as defined in ORS 368.001 and existing transmission line rights-of-way. IPC has designed the Project to be located adjacent to public roads and existing transmission line ROWs to the maximum extent practicable. The Project is too large to be located within existing public ROWs. However, IPC has always treated existing public roads and utility ROWs as routing opportunities, as reflected in the Siting Study, Exhibit B, Attachment B-2. As a result, the Proposed Corridor is located parallel to 76 miles of public roads (I-84) and/or existing transmission lines. This is considerably more than the other corridors under consideration, which was a significant factor in IPC's selection of the Proposed Corridor (see Table B-4).

Since IPC submitted its NOI, it has considered additional locations in which the Project could be located adjacent to existing roads and utility ROWs. IPC has proposed to remove approximately 4.8 miles of existing 138-kV line and use approximately 4.1 miles of this ROW for the proposed 500-kV line. To do this, IPC will rebuild approximately 5.0 miles of single-circuit 69-kV transmission line onto double-circuit 138/69-kV structures within the existing 69-kV ROW.

(iv) Least percentage of the total length of transmission line would be located within lands that would require zone changes, variances or exceptions. IPC has, to the maximum extent practicable, designed the Project to avoid lands for which a zone change, variance, or land use exception would be required. At this time, IPC knows of no zoning changes or variances required by the Project. Much of the Project is located on EFU-zoned lands, a zone for which a transmission line is a permitted use if siting the line on EFU is "necessary" for the Project (ORS 215.283; ORS 215.275). However, as described in detail in Section 6.0 of Exhibit K, the Project will require a Goal 4 exception for the portions of the Site Boundary located in Goal 4 forest lands in Umatilla and Union counties. For most of the Project, no zone change, variance, or exception is required.

(v) Least percentage of the length of the pipeline or transmission line that would be located in a protected area as described in OAR 345-022-0040. As described in detail in Exhibit L, Section 3.3, IPC's Proposed Corridor was developed to avoid protected areas to the maximum extent practicable. There are approximately 82 protected areas within 20 miles of the Site Boundary, and all were considered constraints during the siting process. The Proposed Corridor does cross the corner of one protected area, the Blue Mountain Forest State Scenic Corridor. This crossing is discussed further in Exhibit L, Section 3.3, and Exhibit R, Section 3.4. The fact that the Proposed Corridor avoids 81 of the 82 protected areas within the study area was a strong factor in support of its selection.

(vi) Least disturbance to areas where historical, cultural or archaeological resources are likely to exist. To the extent possible, IPC has designed the Project to avoid disturbance to areas where historical, cultural, or archaeological resources are likely to exist. Historic, cultural, and archeological resources were important considerations in corridor selection and, where possible, these resources were avoided during the siting process. Four cultural resource factors were considered in evaluating the three corridors at the macro level: As shown in Attachment B-3, these included the "Burns District Archaeological Site", locations "within 1200 foot Historic Trail Buffer", "within .5 mi of a National Register Historic Place Buffer", and crossings of "Intact Oregon Trail Segments". Only locations "within 1200 foot of historic trail buffer" show a significant difference in the corridor analysis. For this category, the Eastern Corridor is within 1,200 feet of a historic trail for about 4.5 miles more than the Central and Western corridors. Detailed field studies have been completed to identify additional historical, cultural, or archaeological resources. When these resources cannot be avoided, impacts can be addressed by spanning these resources, separating structures by up to 1,500 feet or more, and by other means such as relocating access roads and construction areas. When avoidance does not eliminate the potential for disturbance, treatment plans can be developed to mitigate impacts.

In 2011 and 2012, IPC performed a cultural survey for the proposed and alternate corridors. Additional surveys of cultural resources will be conducted in 2013. Based upon these data, adjustments have and will be made to the proposed facilities to minimize impacts to historic, cultural, and archeological resources. Exhibit S, Section 3.3 provides additional information on the avoidance of impact to these resources.

(vii) Greatest percentage of the total length the transmission line would be located to avoid seismic, geologic and soils hazards. As described in detail in Section 3.3 of both Exhibits H and I, IPC has designed the Proposed Corridor to avoid seismic, geologic, and soils hazards to the maximum extent practicable. In the corridor selection process there were 17 factors in the list of constraints associated with seismic, geologic, and soils hazards that were used to evaluate the proposed and alternate corridors (see Attachment B-3). Of these factors, four were encountered along the three final corridors considered at the macro level. For slopes greater than 35 percent, high erosion hazard, and landslides, the steeper terrain along the Central and Western corridors indicated a higher potential for impact. The Eastern Corridor showed a higher potential to be near fault lines. As part of micrositing, these factors have been considered in the siting of transmission structures, access roads, and other Project features to minimize seismic, geologic, and soils hazards. Prior to construction, a comprehensive geotechnical investigation will be conducted to further reduce such potential impacts.

(viii) Least percentage of the length of the transmission line located within lands zoned as exclusive farm use. As described in detail in Exhibit K, Sections 3 and 4, IPC has attempted to design the Proposed Corridor to avoid lands zoned EFU to the maximum extent practicable. However, as illustrated by Figure B-3 and Exhibit K, Figure K-2, any corridor that meets the Project's stated purpose—connecting IPC's existing Hemingway Substation to the Pacific Northwest market near Boardman, Oregon—cannot avoid crossing lands zoned EFU. The predominance of land zoned EFU in the study area makes it absolutely necessary for the Project to "cross land in one or more areas zoned for EFU in order to achieve a reasonably direct route." Accordingly, as discussed in detail in Exhibit K, the lack of available non-EFU land is the primary reason that the Project is "locationally dependent" on EFU zones, and is therefore a "utility facility necessary for public service" within the meaning of ORS 215.275. Despite IPC's best efforts to design the Project to avoid EFU-zoned lands, the entire length of the Proposed Corridor in Oregon is zoned EFU or a hybrid farm-forest zone.

Nonetheless, and although not required by ORS 215.275, IPC's extensive siting process has prioritized avoiding impacts to irrigated and other high value farmland to the maximum extent possible.[8] As explained in detail in Attachment B-1, Appendix C, IPC identified irrigated farmland as a "high avoidance" constraint throughout its siting process. In order to both achieve the Project's objective and avoid impacts to the many protected resources in the study area (see discussion of factors i through vii), IPC's 2010 Proposed Corridor crossed 17.8 miles of irrigated farmland. During micrositing, IPC continued to refine its Proposed Corridor in response to site-specific information and landowner requests; these micrositing changes included changes to minimize impacts to irrigated agriculture and agricultural operations. See Table B-6. Additionally, in Exhibit K, Sections 3 and 4, IPC provides the six factor analysis required by ORS 215.275(2).

3.2 Description of Proposed Facility

OAR 345-021-0010(1)(b)(A) A description of the proposed energy facility, including as applicable:

[8] IPC's efforts to minimize impacts to EFU-zoned lands are driven by its own siting objectives as well as OAR 345-021-0010(1)(b)(D)(viii), but not ORS 215.275. ORS 215.275 does not require a "utility facility necessary for public service" that is locationally dependent on EFU to further demonstrate that it has minimized impacts on EFU land. *See WKN Chopin LLC v. Umatilla County*, LUBA Opinion No. 2012-016 at page 17 ("ORS 215.275(2) requires consideration of alternatives to siting the proposed facility 'in an exclusive farm use zone.' There are no such alternatives in this case. ORS 215.275 simply does not require that an applicant proceed through additional inquiries that are designed to minimize impacts on EFU-zoned land, where non-EFU-zoned alternatives are not available.")

The transmission, substation, communication, and related or supporting facilities proposed for this Project are described in the following section. The detail herein and in subsequent sections is based on the preliminary design that has been completed. The exact quantity, size, description, distance between, and placement of the structures and components will depend on the final detailed design of the transmission line, which is influenced by the terrain, land use, and economics.

Project dimensions are listed in Section 3.4, Table B-10. Detailed maps showing temporary and permanent facility locations are contained in Exhibit C, Attachments C-1 and C-2.

3.2.1 Electrical Generating Capacity

(i)	The nominal electric generating capacity and the average electrical generating capacity, as defined in ORS 469.300.

Not applicable. This Project would enhance the region's electrical transmission capabilities. It does not generate any electricity.

3.2.2 Major Components

(ii)	Major components, structures and systems, including a description of the size, type and configuration of equipment used to generate electricity and useful thermal energy.

There is no equipment used to generate electricity and useful thermal energy. The permanent components, structures, and systems that comprise the facility include the transmission line system, substations, and communication facilities.

3.2.2.1 Transmission Line System

The Project is primarily a single-circuit 500-kV electric transmission line.

The Project comprises approximately 277 miles of 500-kV transmission line in Oregon. The Project also includes a related 5-mile rebuild of an existing single circuit 138-kV transmission line and a single circuit 69-kV transmission line together onto a single 138/69-kV double-circuit transmission line. This will also require a short relocation of 0.3 mile of the single-circuit 138-kV transmission line to reconnect the rebuilt 138-kV portion of the double-circuit section back to the undisturbed portion of the single-circuit 138-kV line. These two smaller actions on the 138-kV and 69-kV lines facilitate siting and construction of the 500-kV line on the Proposed Corridor.

The transmission line system is made up of ROW, transmission and foundation structures, conductors, grounding system, communication facilities, and associated hardware. Figure B-12 illustrates the components of the transmission line under construction including foundation and roads discussed below.

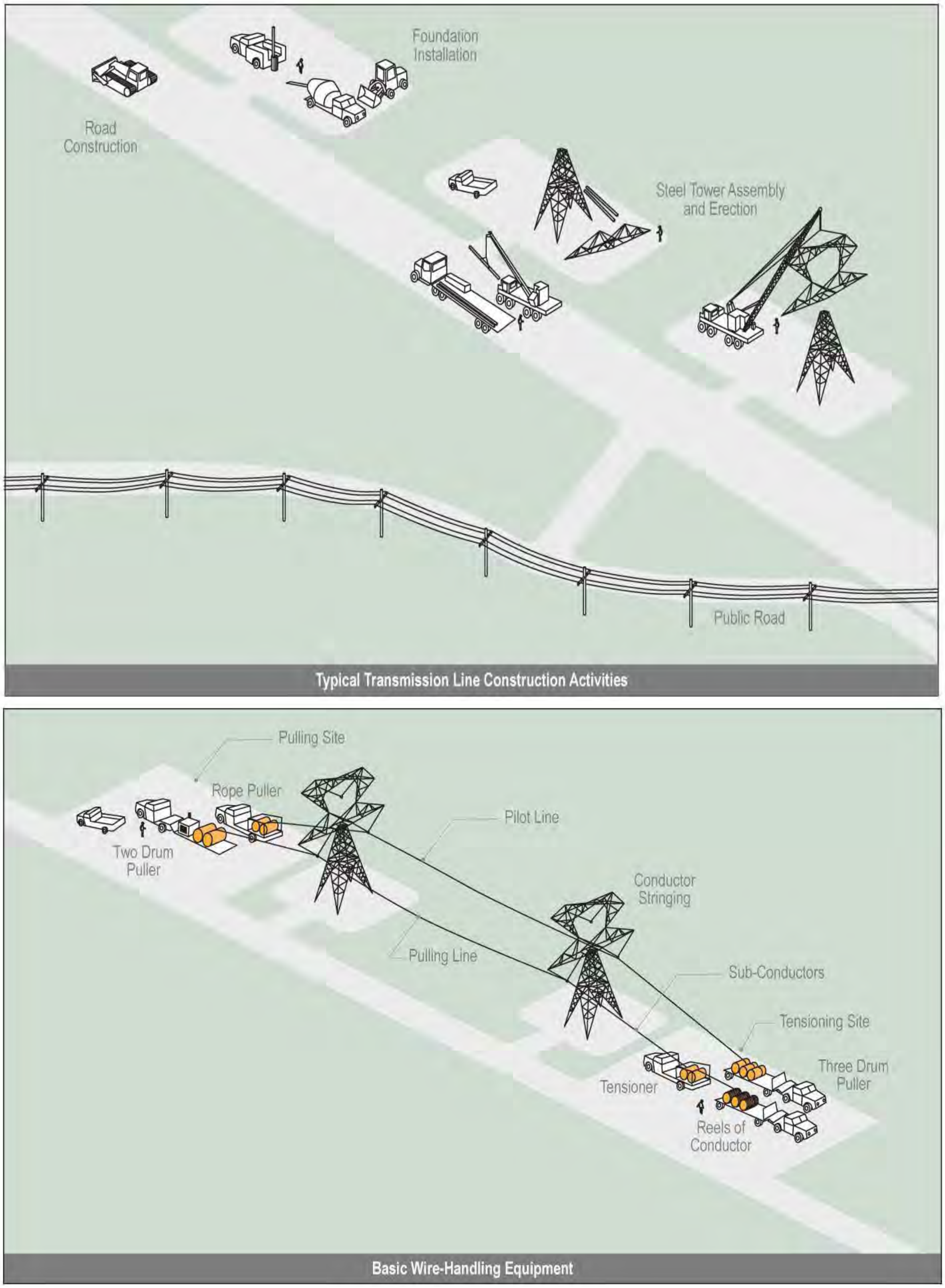


Figure B-12. Illustration of Transmission Line Components

Transmission Structures

Table B-7 describes structure characteristics. The majority of the proposed 500-kV transmission line will be supported by steel lattice towers. Figure B-13 illustrates the typical tangent 500-kV lattice tower structure configuration. An alternative single-circuit tubular steel H-frame structure may be used as required to mitigate sensitive environmental resources or where land use requires shorter structure heights. Figure B-14 illustrates a tangent 500-kV tubular steel H-frame structure. Figure B-15 presents the configuration of the alternative 500-kV monopole structure that could be used in active agricultural areas to avoid critical farming operations. Figure B-16 provides an illustration of a typical 138/69-kV tangent structure with 12.5-kV underbuild distribution that would be used for approximately 5.3 miles.[9] Figure B-17 illustrates the typical 230-kV H-frame structure configuration.

Table B-7. Proposed and Alternate Corridor Structure Characteristics

Structure Type	Typical Height (feet)	Average Distance Between Structures (feet)	Temporary Disturbance Area per structure	Permanent Disturbance Area per structure
Proposed Corridor				
500-kV Single Circuit Lattice Structure	110-195	1,200-1,300	250 feet x 250 feet = 1.43 acre	50 feet x 50 feet = 0.06 acre
500-kV Alternative Single Circuit H-Frame Structure	100-165	900-1,300	250 feet x 250 feet = 1.43 acre	50 feet x 50 feet = 0.06 acre
500-kV Alternative Monopole Structure	110-195	600-1,000	100 feet x 100 feet = 0.23 acre	50 feet x 50 feet = 0.06 acre
138/69-kV Double Circuit Monopole Structure	55-100	300-400	100 feet x 100 feet = 0.23 acre	50 feet x 50 feet = 0.06 acre
Flagstaff Alternate Corridor Segment Rebuild				
230-kV Single–Circuit H-Frame Structure	50-90	600-800	125 feet x 150 feet = 0.43 acre	50 feet x 50 feet = 0.06 acre

[9] Of the 5.3 miles, 0.3 mile would be a 138-kV single-circuit that, because of its limited extent, is not further discussed in this document.

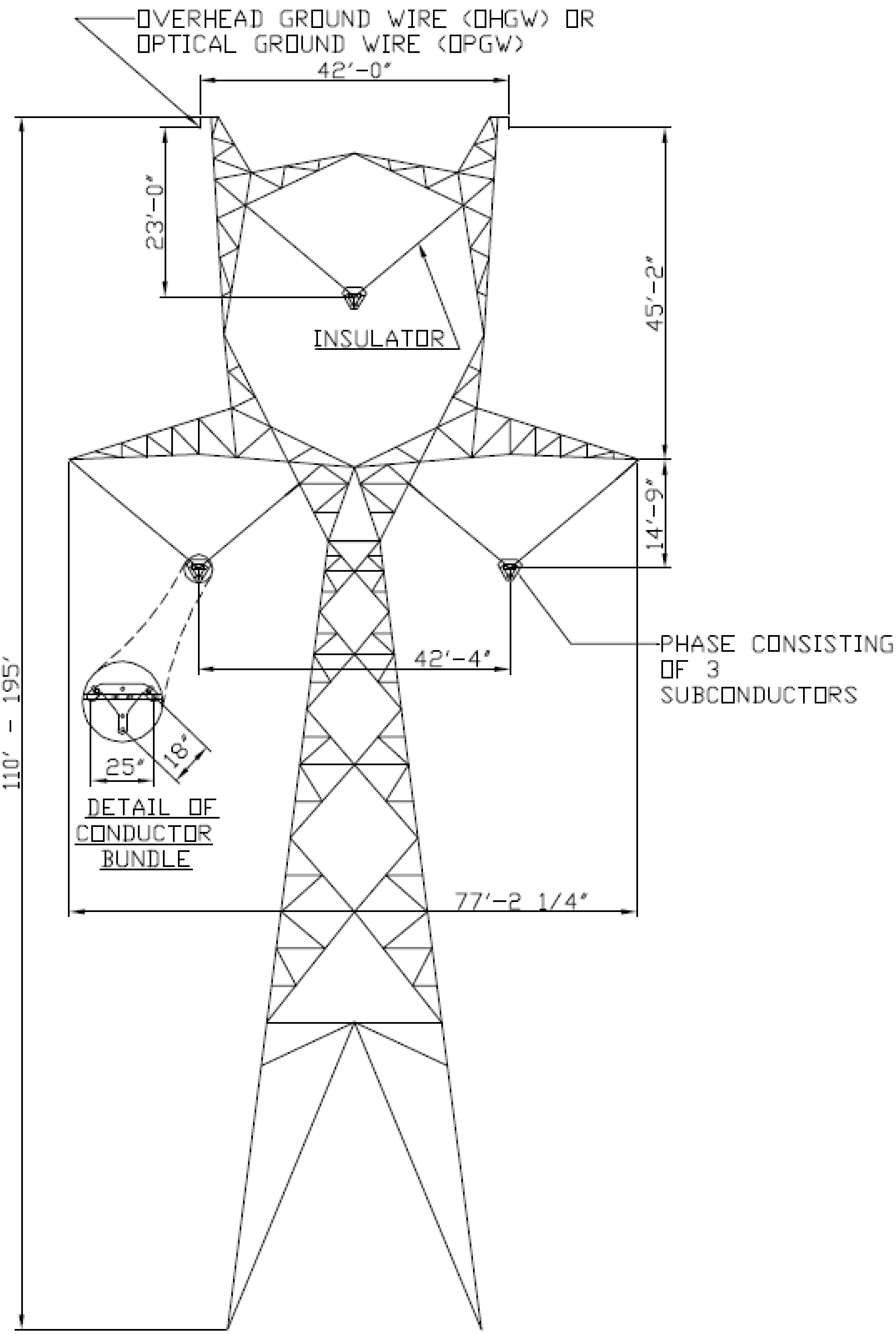


Figure B-13. Proposed 500-kV Single Circuit Lattice Steel Structure

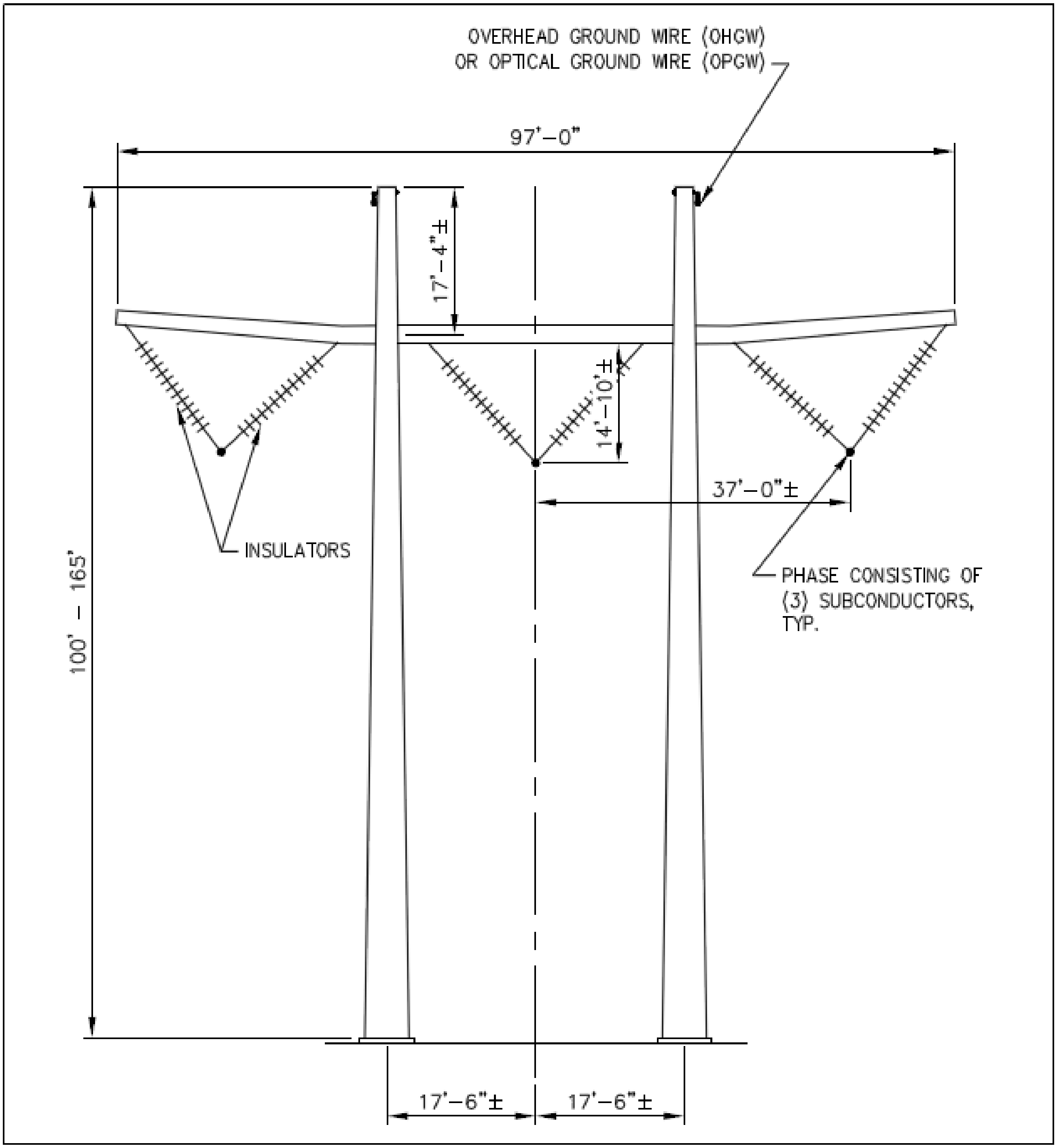
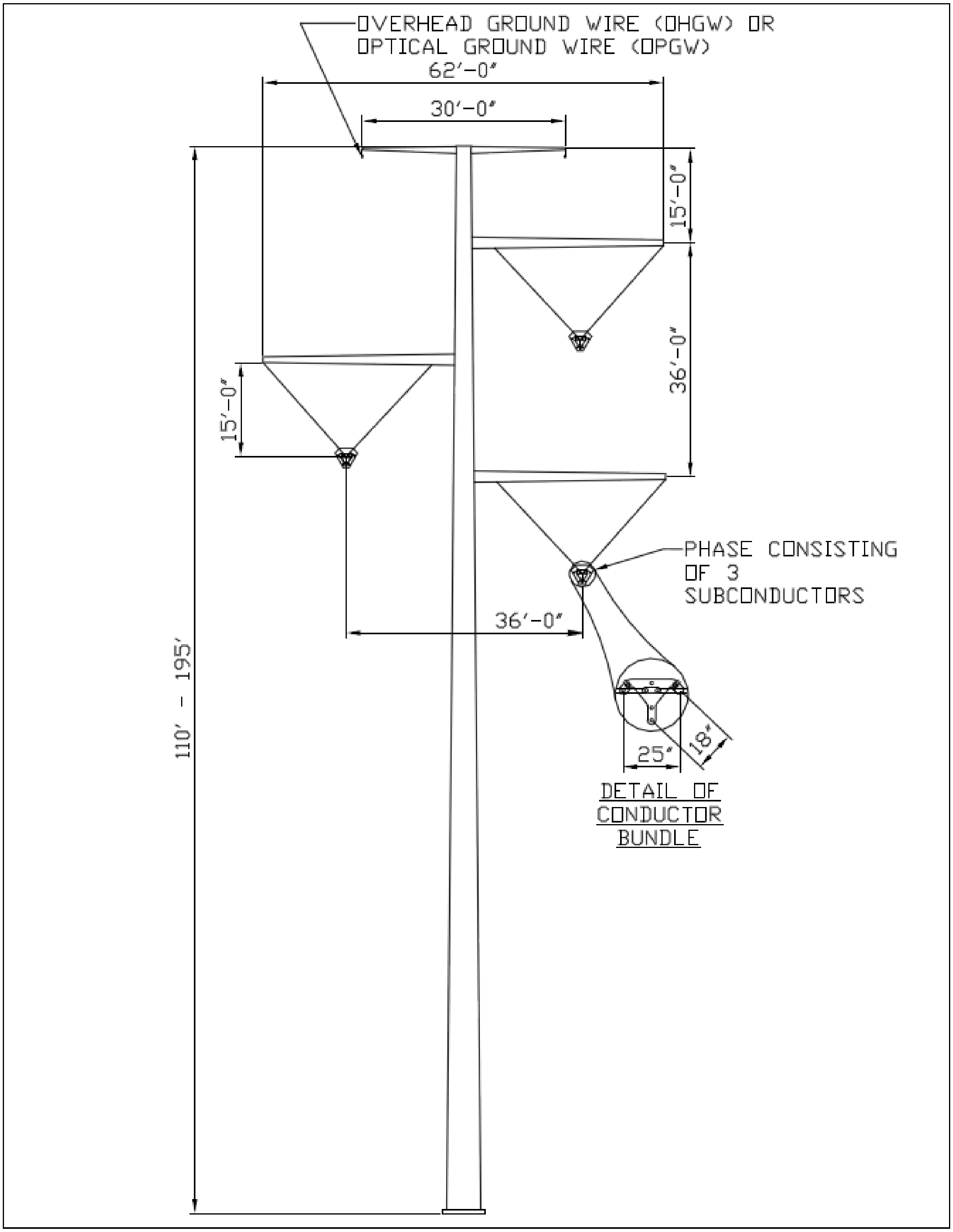


Figure B-14. Alternative 500-kV Single-Circuit Tubular Steel Pole H-frame Structure

1 

2 **Figure B-15.** Alternative 500-kV Steel Monopole Structure

3

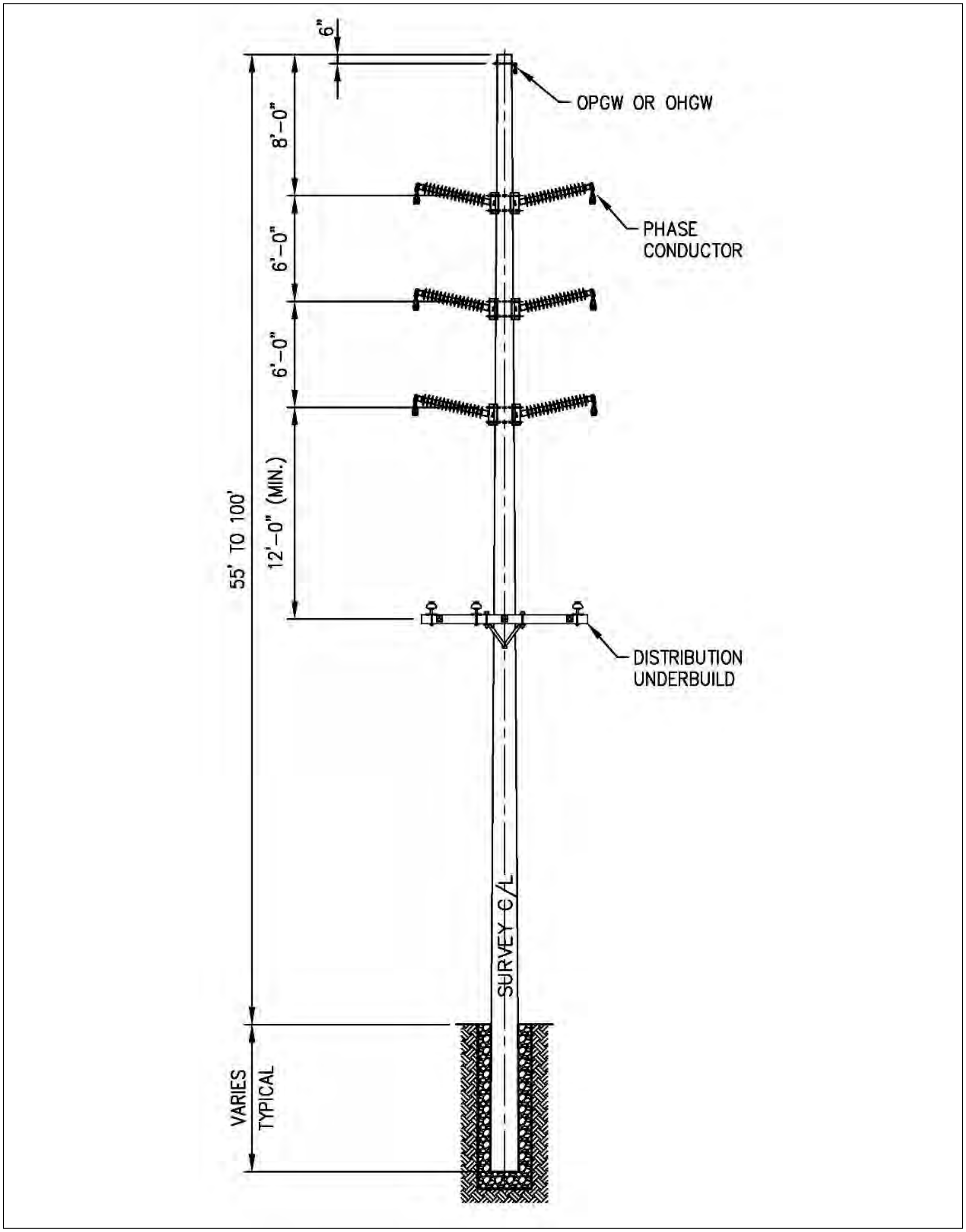


Figure B-16. Proposed 138/69-kV Double-Circuit Steel Monopole Structure with Distribution Underbuild

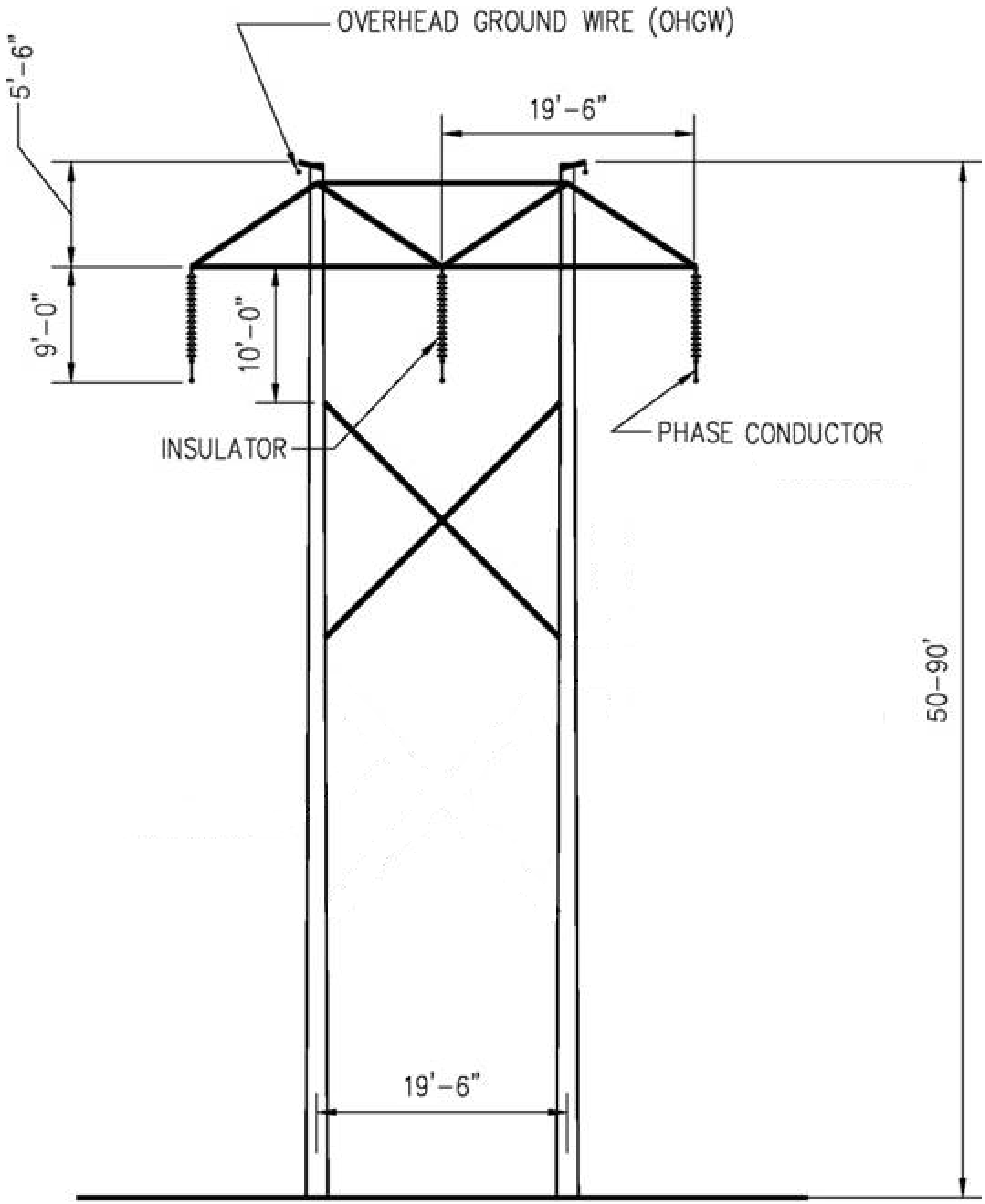


Figure B-17. Flagstaff Alternate Corridor Segment Rebuild Single-Circuit 230-kV H-Frame Structure

IPC will also use several types of support structures for special purposes as described below.

- *Tangent Structures* – Tangent structures are the most common type of structure and will be used along straight sections of the alignment. These structures are designed to support a range of wind and ice loading conditions but will only support loads associated with very slight line angles (0 to 1 degrees).
- *Angle Structures* – Angle structures are used at angle points along the transmission line corridor. Angle structures that are not designed as dead-end or terminal structures are called "running" angle structures. "Running" angle structures are designed to support a range of wind and ice loading conditions and will support loads associated with moderate line angles up to 25 degrees. Angle structures are typically designed for a specific range angles: 3 to 10 degrees, 10 to 25 degrees, etc.
- *Dead-End Structures* – Dead-end structures are generally used at substation termination points, line angles greater than 25 degrees, on each end of long spans such as those crossing canyons and wide rivers, and other points along the transmission line where it is appropriate to support the tension in the conductor. Dead-end structures are designed to support the vertical loads, transverse loads, line angle loads (where appropriate), and the longitudinal load of the conductor. Dead-end structures may also be used in situations where maintaining clearance is difficult with tangent structures.
- *Steel Monopoles* – Monopoles are tubular steel structures fabricated from high strength plate steel formed into tubes. Tubular poles can be fabricated into various structure configurations including single-pole, two-pole H-frame, and three-pole. Tubular steel may be painted, galvanized, or made from weathering steel. Tubular steel structures may be directly embedded or bolted to drilled piers, piles, or a cast-in-place foundation, allowing their use in various soil types.
- *Transmission Line Crossing Structures* – Transmission line crossing structures are fabricated from high strength steel. These structures may be delta configuration lattice steel towers or tubular H-frame structures. Preferably, these structures are located perpendicular to the line being crossed. These structures' arrangements will allow the 500-kV line to cross over the top of lower voltage transmission lines or under other 500-kV lines when necessary. Crossing structures will have the same design properties as other transmission structures.
- *Transposition Structures* – At certain points along the transmission line corridor, it may be necessary to install transposition structures. A transposition structure is a transmission structure used to "transpose" each of the three phases (or conductors) in the transmission circuit so that each phase changes its relative place in the transmission circuit. Transposition structures used on the Project will be modified dead-end structures with added arms and insulator strings that will allow the phases to move to different positions on the structure. The need to install a transposition structure is dependent on the electrical characteristics and length of the line and the need to balance the electrical impedance of the transmission line between substations.

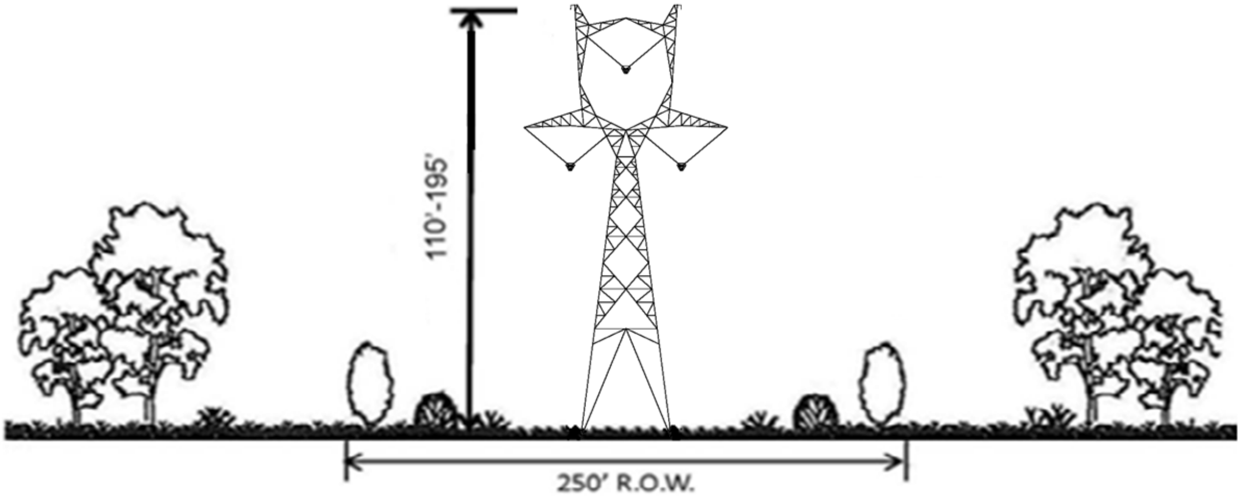
Right-of-Way Width

The ROW width for the single-circuit 500-kV line will be up to 250 feet. The ROW width for the 5.0-mile rebuild of existing 138-kV and 69-kV transmission lines onto double-circuit structures and relocation of 0.3 mile of a 138-kV transmission line will be up to 100 feet. The ROW width for the single-circuit 230-kV relocation portion of the Flagstaff Alternate Corridor Segment will be up to 125 feet.

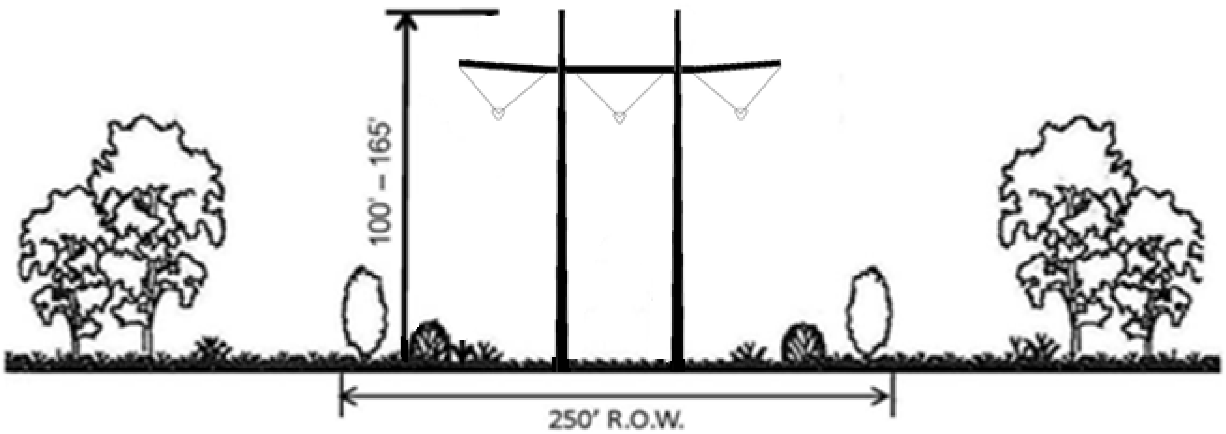
Figures B-18 and B-19 illustrate the ROW width requirements for the proposed and alternative tangent structures. The determination of these widths is based on three criteria:

- Sufficient National Electrical Safety Code (NESC) clearance must be maintained to the edge of the ROW during a wind event when the conductors are blown towards the ROW edge.
- Sufficient room must be provided within the ROW to perform transmission line maintenance.
- Sufficient clearances must be maintained from the transmission line to the edge of the ROW where structures or trees may be located and deemed a hazard or danger to the transmission line.

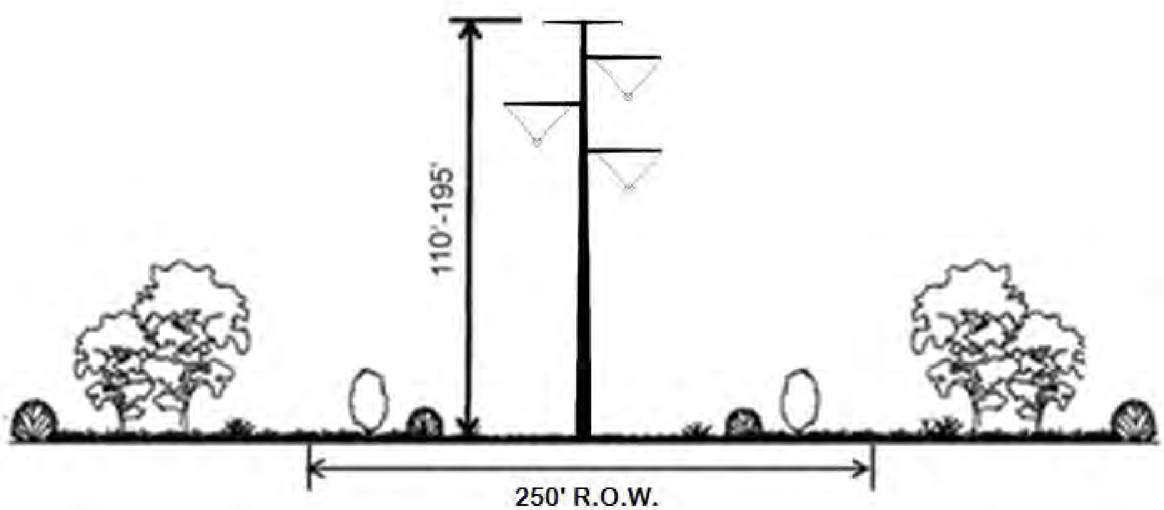
Specific localized conditions may result in slightly different ROW widths. These will be finalized during the detailed design.



Proposed 500-kV Steel Lattice ROW Design

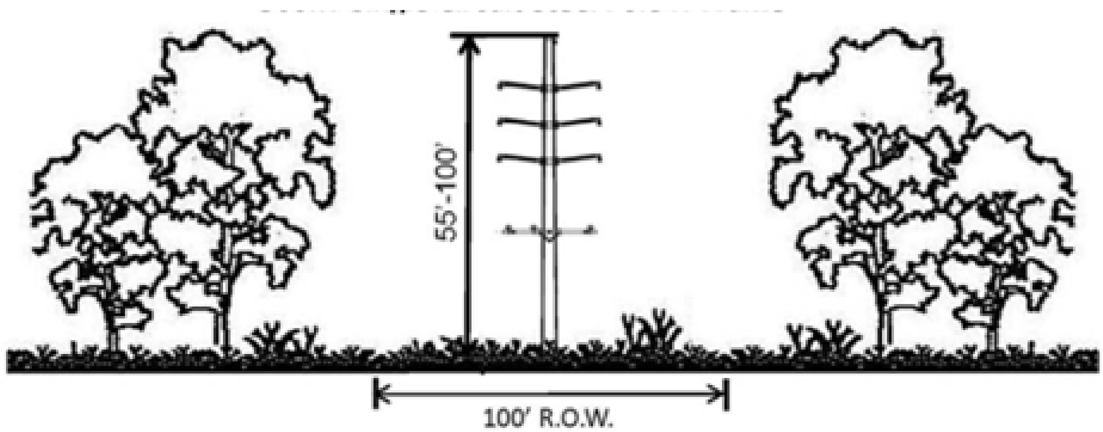


Alternative 500-kV Steel Pole H-Frame ROW Design

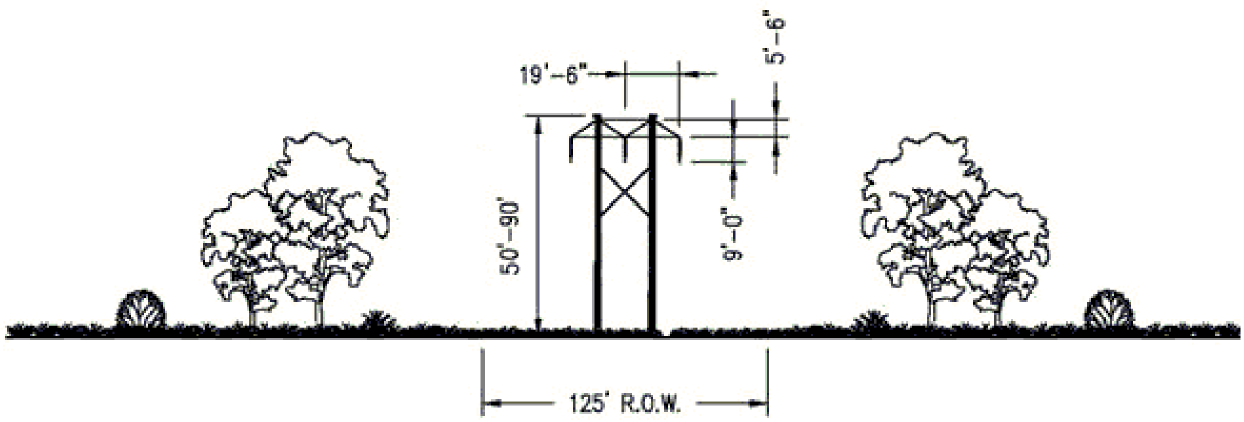


Alternative 500-kV Steel Monopole ROW Design

Figure B-18. 500-kV ROW Designs



Proposed 138-kV/69-kV Double Circuit Structure with Distribution Underbuild



Flagstaff Alternate Rebuild 230-kV Single-Circuit H-Frame

Figure B-19. 138-kV/69-kV and 230-kV ROW Designs

Structure and Conductor Clearances

Conductor phase-to-phase and phase-to-ground clearance parameters are determined in accordance with IPC company standards and the NESC, ANSI C2, produced by the American National Standards Institute (ANSI). These documents provide minimum distances between the conductors and ground, crossing points of other lines and the transmission support structure, and other conductors, and minimum working clearances for personnel during energized operation and maintenance activities (IEEE 2011). Typically, the clearance of conductors above ground is 37 feet for 500-kV, but where the line crosses land used for agricultural purposes a minimum clearance of 40 feet will be used to allow for equipment clearance. For the 230-kV section, the clearance of conductors above ground is 27 feet. For the 138/69-kV double-circuit section, the 12.5-kV distribution conductor clearance is 22 feet above grade.

Structure Foundations

The 500-kV single-circuit lattice steel structures each require four foundations, one on each of the four corners of the lattice towers. The foundation style, diameter, and depth will be determined during final design and are dependent on structure loading conditions and the type of soil or rock present at each specific site. The preliminary design indicates the foundations for the single-circuit tangent lattice towers will be composed of steel-reinforced concrete drilled piers with a typical diameter of 4 feet and a depth of approximately 15 feet. For the 500-kV H-frame structures, each tangent structure will require two foundations, one for each pole that comprises the H-frame structure. Angle and dead-end structures will use a three-pole structure, each with its own foundation. They will be steel-reinforced drilled piers with a typical diameter of 6 to 8 feet and a depth of approximately 25 to 40 feet. The 138/69-kV monopole structures will be a combination of direct-embedded steel poles and self-supported poles on drilled pier foundations. Tangent structures will be direct-embedded in a single drilled boring, typically 5 feet in diameter and 15 feet deep. Angle and dead-end structures will be on steel-reinforced drilled pier foundations with a typical diameter of 5 to 6 feet and a depth of approximately 20 to 25 feet. For the 230-kV H-frame structures, each of the two poles for tangent structures will be direct-embedded. Each of the three poles that make up the angle and dead-end structures will be direct-embedded and guyed. Typical direct-embedded foundations sizes will be 5 feet in diameter and 12 feet deep.

Typical foundation diameters and depths for the proposed structure families are shown in Table B-8.

Table B-8. Foundation Excavation Dimensions

Proposed and Alternative Structures	Holes Per Structure	Typical Depth (feet)	Typical Diameter (feet)	Est. Concrete Volume (cubic yards)
500-kV Single Circuit – Light Tangent Lattice Tower	4	15	4	28
500-kV Single Circuit – Heavy Tangent Lattice Tower	4	18	5	52
500-kV Single Circuit – Small Angle Lattice Tower	4	16	6	68
500-kV Single Circuit – Medium Angle Lattice Tower	4	21	6.5	104
500-kV Single Circuit – Medium Dead-End Lattice Tower	4	28	7	160
500-kV Single Circuit – Heavy Dead-End Lattice Tower	4	30	7	172
500-kV Single Circuit – Tangent H-Frame Structure	2	25	6	53
500-kV Single Circuit – Angle H-Frame Structure	3	30	7	129
500-kV Single Circuit – Dead-end H-Frame Structure	3	40	8	224
138/69-kV Double Circuit – Monopole Tangent Structure (Direct-Embedded)	1	15	5	N/A
138/69-kV Double Circuit – Monopole Angle Structure	1	20	5	15
138/69-kV Double Circuit – Monopole Dead-end Structure	1	25	6	27

Table B-8. Foundation Excavation Dimensions (continued)

Proposed and Alternative Structures	Holes Per Structure	Typical Depth (feet)	Typical Diameter (feet)	Est. Concrete Volume (cubic yards)
230-kV Single Circuit – Tangent H-Frame Structure (Direct-Embedded)	2	12	5	N/A
230-kV Single Circuit – Angle H-Frame Structure (Direct-Embedded)	3	12	5	N/A
230-kV Single Circuit – Dead-end 3 Pole Guyed Structure (Direct-Embedded)	3	12	5	N/A

Conductors

The proposed conductor for the 500-kV lines is 1,272 KCM[10] ACSR "Bittern" 45/7[11]. Each phase of a 500-kV three-phase circuit[12] will be composed of three subconductors in a triple bundle configuration. The individual 1,272 KCM conductors will be bundled in a triangular configuration with spacing of 25 inches between horizontal subconductors and 18 inches of diagonal separation between the top two conductors and the lower conductor (see Figure B-13). The triple-bundled configuration is proposed to provide adequate current carrying capacity and to provide for a reduction in audible noise and radio interference as compared to a single large-diameter conductor. Each 500-kV subconductor will have a 45/7 aluminum/steel stranding, with an overall conductor diameter of 1.345 inches and a weight of 1.432 pounds per foot and a non-specular finish.[13]

Where multiple conductors are utilized in a bundle for each phase, the bundle spacing will be maintained through the use of conductor spacers at intermediate points along the conductor bundle between each structure. The spacers serve a dual purpose: in addition to maintaining the correct bundle configuration and spacing, the spacers are also designed to damp out wind-induced vibration in the conductors. The number of spacers required in each span between towers will be determined during the final design of the transmission line.

The proposed conductor for the relocated 230-kV line on the Flagstaff Alternate is 795 KCM 26/7 ACSR "Drake." Each phase of the 230-kV three-phase circuit will be composed of one conductor. Each conductor will have an overall diameter of 1.107 inches and a weight of 1.093 pounds per foot and a non-specular finish.

The proposed conductors for the 138/69-kV monopole structure lines are 397 KCM 26/7 ACSR "Ibis" (138-kV, one conductor per phase), 4/0 6/1 ACSR "Penguin" (69-kV, one conductor per phase), 2/0 ACSR "Quail" conductor (12.5-kV distribution, one conductor per phase plus neutral wire), and a 3/8-inch extra high strength (EHS) 7-strand shield wire at the top of the structures.

[10] KCM (1,000 cmils) is a quantity of measure for the size of a conductor; kcmil wire size is the equivalent cross-sectional area in thousands of circular mils. A circular mil (cmil) is the area of a circle with a diameter of one thousandth (0.001) of an inch.

[11] Aluminum/steel refers to the conductor material composition. The preceding numbers indicate the number of strands of each material type present in the conductor (i.e., 45/7 aluminum/steel stranding has 45 aluminum strands wound around 7 steel strands).

[12] For AC transmission lines, a circuit consists of three phases. A phase may consist of one conductor or multiple conductors (i.e., subconductors) bundled together.

[13] Non-specular finish refers to a "dull" finish rather than a "shiny" finish.

Conductors will be aligned with typical vertical spacing of 8 feet between shield wire and 69- or 138-kV phase wires, 6 feet between phase wires, and a minimum of 12 feet between 138- or 69-kV phase wires and distribution wires.

Other Hardware

Insulators

As shown in Figure B-13, the typical insulator assemblies for 500-kV steel lattice tangent structures and H-frame structures will consist of two insulators hung in the form of a “V.” As shown in Figure B-16, insulator assemblies for 138/69-kV tangent structures will consist of supported insulators which extend horizontally away from the monopole. As shown in Figure B-17, insulator assemblies for 230-kV H-frame structures will consist of a single insulator suspended from the structure cross arm in the form of an “I”. Insulators are used to suspend each conductor bundle (phase) from the structure, maintaining the appropriate electrical clearance between the conductors, the ground, and the structure. The V-shaped configuration of the 500-kV insulators allows for a more compact structure configuration as it restrains the conductor so that it will not swing into the structure in high winds. Dead-end insulator assemblies for the transmission lines will use an I-shaped configuration, which consists of insulators hung from either a tower dead-end arm or a dead-end pole in the form of an “I.” Insulators will be composed of grey porcelain or green-tinted toughened glass.

Grounding Systems

Alternating current (AC) transmission lines such as the Project transmission lines have the potential to induce currents on adjacent metallic structures such as transmission lines, railroads, pipelines, fences, or structures that are parallel to, cross, or are adjacent to the transmission line. Induced currents on these facilities will occur to some degree during steady-state operating conditions and during a fault condition on the transmission line. For example, during a lightning strike on the line, the insulators may flash over, causing a fault condition on the line and current will flow down the structure through the grounding system (i.e., ground rod or counterpoise) and into the ground. The magnitude of the effects of the AC induced currents on adjacent facilities is highly dependent on the magnitude of the current flows in the transmission line, the proximity of the adjacent facility to the line, and the distance (length) for which the two facilities parallel one another in proximity.

The methods and equipment needed to mitigate these conditions will be determined through electrical studies of the specific situation. As standard practice and as part of the design of the Project, electrical equipment and fencing at the substation will be grounded. All fences, metal gates, pipelines, metal buildings, and other metal structures adjacent to the ROW that cross or are within the transmission line ROW will be grounded as determined necessary. If applicable, grounding of metallic objects outside of the ROW may also occur, depending on the distance from the transmission line as determined through the electrical studies. These actions address the majority of induced current effects on metallic facilities adjacent to the line by shunting the induced currents to ground through ground rods, ground mats, and other grounding systems, thus reducing the effect that a person may experience when touching a metallic object near the line (i.e., reduce electric shock potential). Transmission line public health effects are discussed in Exhibit AA, Section 3.3.

During final design of the transmission line, appropriate electrical studies will be conducted to identify the issues associated with paralleling other facilities and the types of equipment that will need to be installed (if any) to mitigate the effects of the induced currents.

Minor Additional Hardware

In addition to the conductors, insulators, and overhead shield wires, other associated hardware will be installed on the tower as part of the insulator assembly to support the conductors and shield wires. This hardware will include clamps, shackles, links, plates, and various other pieces composed of galvanized steel and aluminum.

A grounding system will be installed at the base of each transmission structure that will consist of copper or copper-clad ground rods embedded into the ground in immediate proximity to the structure foundation and connected to the structure by a buried copper lead. When the resistance to ground for a grounded transmission structure is greater than a specified impedance value with the use of ground rods, counterpoise will be installed to lower the resistance to below a specified impedance value. Counterpoise consists of a bare copper-clad or galvanized-steel cable buried a minimum of 12 inches deep, extending from structures (from one or more legs of structure) for approximately 200 feet within the ROW.

Other hardware that is not associated with the transmission of electricity may be installed as part of the Project. This hardware may include aerial marker spheres or aircraft warning lighting as required for the conductors or structures per Federal Aviation Administration (FAA) regulations.[14] Structure proximity to airports and structure height are the determinants of whether FAA regulations will apply based on an assessment of wire/tower strike risk. IPC does not anticipate that structure lighting will be required because proposed structures will be less than 200 feet tall and will not be near airports that require structure lighting.

3.2.2.2 Substations

As explained above in Section 1.3, IPC identified the need for a Project endpoint in the Boardman, Oregon, area because it is the easternmost point at which IPC can feasibly interconnect to the Pacific Northwest market. Although IPC's application for site certificate includes three alternate substation endpoints, IPC will ultimately select only one substation for development.

Proposed Grassland Substation Expansion

IPC's preferred terminus for the Proposed Corridor is the proposed Grassland Substation, a 34-acre substation that PGE has proposed for development on private lands west of PGE's existing Boardman (Coal) Generating Plant.[15] PGE has planned the Grassland Substation to electrically terminate up to six new transmission lines: one from existing Coyote Springs Substation, one from PGE's Boardman Generating Plant, one from PGE's Carty Generating Plant, two from PGE's proposed Cascade Crossing Project, and one from IPC's Boardman to Hemingway Project.[16] In order to accommodate the 500-kV series capacitor bank and shunt reactor bank needed for the Project, IPC proposes to develop a 3-acre expansion of the southeast corner of the proposed Grassland Substation as shown in Exhibit C, Attachment C-1, Figure C-1-1. IPC is not proposing a distribution line to the Proposed Grassland Substation Expansion because a power supply will already be in place by the time IPC develops its 3-acre expansion.

[14] U.S. Department of Transportation, Federal Aviation Administration, Advisory Circular AC 70/7460-1K Obstruction Marking and Lighting, August 1, 2000; and Advisory Circular AC 70/7460-2K Proposed Construction or Alteration of Objects that May Affect the Navigable Airspace, March 1, 2000.

[15] PGE has proposed the Grassland Substation for development in connection with at least two proposed facilities, one of which has been issued a Site Certificate (Carty Generating Station) and one currently under review by the Oregon Energy Facility Siting Council (Cascade Crossing 500-kV transmission line).

[16] See PGE's Preliminary Application for Site Certificate for Cascade Crossing Transmission Project, Exhibit B, Table B-1 and Section 4.4.1 for additional information.

Alternate Horn Butte Substation

The Alternate Horn Butte Substation is essentially an alternate endpoint for the Proposed Corridor. There is no existing or proposed substation in the vicinity of the Alternate Horn Butte Substation; if IPC elects to terminate the Project at Horn Butte, it will independently develop the 20-acre facility. In the event that IPC ultimately selects the Alternate Horn Butte Substation for development, it will ask the local electric service provider to develop a distribution line to serve the new substation.[17]

Alternate Longhorn Substation Expansion

Finally, IPC's application for site certificate also proposes an alternate corridor segment, the Longhorn Alternate, that IPC designed to terminate the Project at a substation proposed for development by BPA.[18] BPA has planned the Longhorn Substation on land currently owned by the Port of Morrow. In this application, IPC has proposed a 3-acre expansion of BPA's planned Longhorn Substation, which IPC would construct and operate if it develops the Longhorn Alternate. IPC is not proposing a distribution line to the Proposed Grassland Substation Expansion because a power supply will already be in place by the time IPC develops its 3-acre expansion.

Each of these substations is described in more detail in Exhibit C, Section 3.2 and Attachment C-1, Figures C-1-1 through C-1-3. For each Project line termination in these stations, IPC would install 500-kV circuit breakers, high-voltage switches, bus supports, and transmission line termination structures, 500-kV series capacitor bank, and 500-kV shunt reactor bank. The 500-kV transmission line termination structures are approximately 125 to 135 feet tall. A control house to accommodate the necessary system communications and control equipment will be constructed as necessary. A new all-weather access road will be used to reach the site and the site would be supplied by distribution power brought in from the nearby existing system as necessary. Fiber optic signal communication equipment and a backup propane-powered generator will be installed. Figure B-20 is a perspective sketch illustrating the appearance of a typical 500-kV substation with multiple line connections.

[17] IPC will request electric service from the local service provider, and that service provider will be responsible for the permitting and construction required to extend the closest local distribution line to the new communication station. It is IPC's position that these distribution lines do not fall within the definition of "related and supporting facilities" in ORS 469.300(24) because they are not now, and will not be, "proposed by the applicant." Based on preliminary informal direction from ODOE, IPC has included the distribution lines in the Project Site Boundary for this Preliminary ASC. However, IPC will remove the distribution lines from its ASC upon receipt of additional guidance from ODOE confirming that the distribution lines are not "related and supporting facilities" subject to EFSC jurisdiction.

[18] BPA has proposed the Longhorn substation for development on land owned by the Port of Morrow.

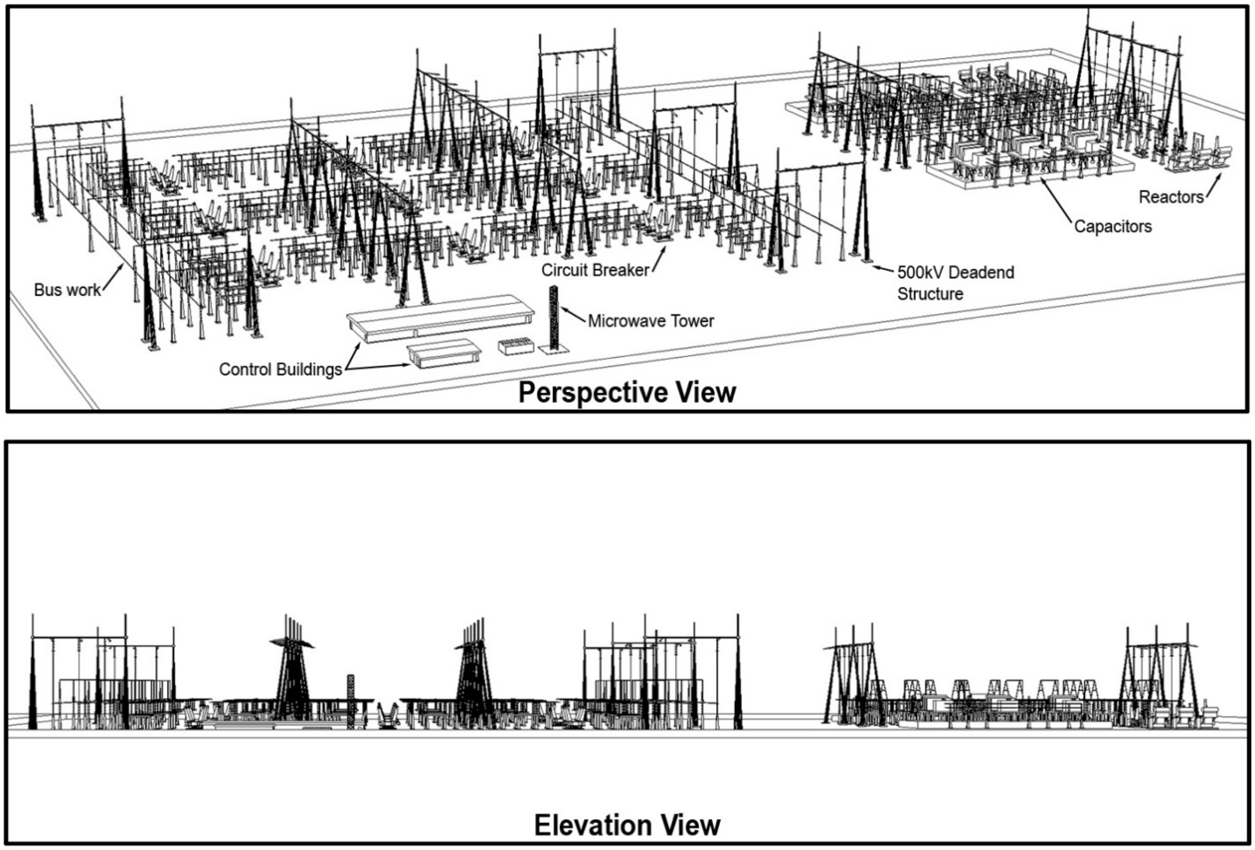


Figure B-20. Typical 500-kV Substation

3.2.2.3 Communication System

Optical Ground Wire

Reliable and secure communications for system control and monitoring is very important to maintain the operational integrity of the Project and of the overall interconnected system. Primary communications for relaying and control will be provided via the optical ground wire (OPGW) that will be installed on the transmission lines; this path is intended for IPC use. A secondary communication path may also be developed using a power line carrier. No new microwave sites are planned for the Project. Updated microwave equipment may be installed at the substations.

Each 500-kV structure will have two lightning protection shield wires installed on the structure peaks (see Figures B-13 and B-14). One of the shield wires will be composed of extra high strength steel wire with a diameter of 0.495 inch and a weight of 0.517 pound per foot. The second shield wire will be an OPGW constructed of aluminum and steel, and will carry 48 glass fibers within its core. The OPGW will have a diameter of 0.646 inch and a weight of 0.407 pound per foot. The glass fibers inside the OPGW shield wire will provide optical data transfer capability among IPC's facilities along the fiber path. The data transferred are required for system control and monitoring.

Communication Station Sites

As the data signal is passed through the optical fiber cable, the signal degrades with distance. Consequently, signal communication station sites are required to amplify the signals if the distance between substations or communication station sites exceeds approximately 40 miles.

The locations of communication station sites are listed in Exhibit C, Table C-14 and shown on the maps in Attachment C-2. A total of eight proposed and four alternate communication station sites have been identified. Communication station sites will be located on private and public lands.

Facility service power will be required at each of the eight communication station sites ultimately selected for development. Typically, facility service power is provided from a local electric distribution line located in proximity to the substation or communication station site. The voltage of the distribution supply line is typically 34.5-kV or lower and carried on wood poles. The location of the service power lines is identified in Exhibit C, Table C-15 and the location is shown on the maps in Exhibit C, Attachment C-2.[19]

The typical communication station site will be 100 feet by 100 feet, with a fenced area of 75 feet by 75 feet. A prefabricated concrete communications shelter with dimensions of approximately 11.5-foot by 32-foot by 12-foot-tall will be placed on the site and access roads to the site and power from the local electric distribution circuits will be required. An emergency generator with a liquified propane gas tank will be installed at the site inside the fenced area. Two separate conduit or aerial cable routes will be used for each fiber optic cable bundle between the transmission line and communication station. Figure B-21 illustrates the plan arrangement of a typical communications station site layout.

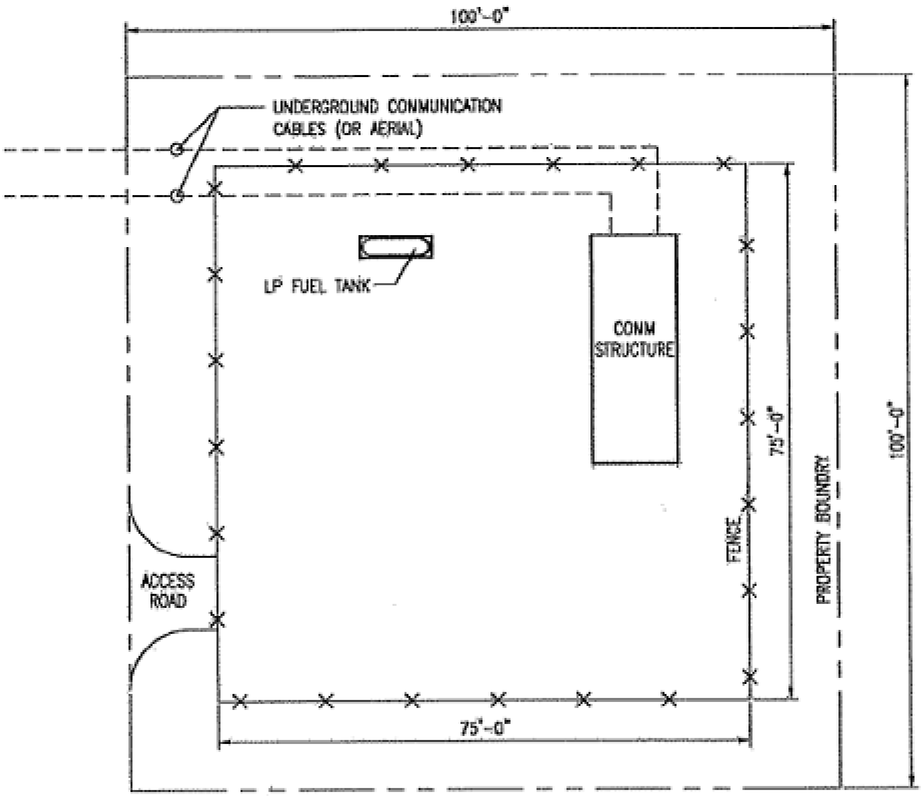


Figure B-21. Typical Communication Station Site Layout

[19] As explained in greater detail in Section 3.3 of Exhibit B, each communication station will require electric power service. IPC will request electric service from the local service provider, and that service provider will be responsible for the permitting and construction required to extend the closest local distribution line to the new communication station. It is IPC's position that these distribution lines do not fall within the definition of "related and supporting facilities" in ORS 469.300(24) because they are not now, and will not be, "proposed by the applicant." Based on preliminary informal direction from ODOE, IPC has included the distribution lines in the Project Site Boundary for this Preliminary ASC. However, IPC will remove the distribution lines from its ASC upon receipt of written guidance from ODOE confirming that the distribution lines are not "related and supporting facilities" subject to EFSC jurisdiction.

3.2.3 Site Plan and General Arrangement

(iii)	A site plan and general arrangement of building, equipment and structures.

The site plan and general arrangement of substations and communication facilities are shown in Figures B-20 and B-21.

3.2.4 Fuel and Chemical Storage Facilities

(iv)	Fuel and chemical storage facilities, including structures and systems for spill containment.

During construction, gasoline, diesel fuel, crankcase oil, lubricants, and cleaning solvents will be present along the transmission line corridor, typically at multi-use areas, and at the substation selected for development. These products will be used to fuel, lubricate, and clean vehicles and equipment and will be transported in containerized trucks or in other federal and state approved containers. Enclosed containment will be provided for petroleum products and wastes and petroleum-related construction waste will be removed to a disposal facility authorized to accept such materials. Fuel and chemicals will be properly stored to prevent drainage or accidents. Where required, preventive measures such as the use of vehicle drip pans for overnight parking areas may be implemented. Routine visual inspection for presence of petroleum leaks will be required for vehicles. Diesel fuel tanks will be located at the multi-use areas for vehicle and equipment fueling. Each fuel tank will be located within secondary containment and each station will be equipped with a spill kit. When on-ROW refueling is necessary, it will be done away from waterways. Accidental releases of hazardous materials will be prevented or minimized through proper containment of these substances during use and transportation to the site. A Spill Prevention, Containment, and Countermeasures Plan will be prepared for covering substation construction and operations.

During operations no fuels or potentially hazardous materials such as general lubricants, general cleaners, ethylene glycol (antifreeze), vehicle fuel, and herbicides for weed control will be stored on the ROW. When used, they will be stored and disposed of in accordance with applicable local, state, federal environmental laws and regulations, and product labels where applicable. At the substation and communication stations, liquid propane will be stored in approved tanks. Substation transformers will be filled with an insulating mineral oil. Secondary containment structures will be installed to prevent oil from this equipment from reaching ground or water bodies in the event of a rupture or leak. IPC will use a standard type of oil containment consisting of a pit of a calculated capacity under the oil-filled equipment that has an oil-impervious liner. The pit is filled with rock to grade level. In case of an oil leak or rupture, the oil captured in the containment pit is removed and transported to a disposal facility.

Section 3.3 of Exhibits G and V describe quantities and handling procedures for fuel, lubricating oils, transformer oils, and other petroleum products and chemicals in greater detail.

3.2.5 Equipment and Systems for Fire

(v)	Equipment and systems for fire prevention and control.

During construction, the risk of fire danger is related to smoking, refueling activities, operating vehicles and other equipment off improved roadways, welding activities, and the use of explosive materials and flammable liquids. During operation, the risk of fire is primarily from vehicles and maintenance activities that require welding. Additionally, weather events that affect the transmission line could result in the transmission line igniting a fire.

All federal, state, and county laws, ordinances, rules, and regulations pertaining to fire prevention and suppression will be strictly adhered to. All personnel will be advised of their responsibilities under the applicable fire laws and regulations.

The prevention and suppression of wildfires in eastern Oregon is carried out by the BLM, USFS, and local fire districts and agencies (Table B-9). The agencies' activities are closely coordinated, primarily through the Pacific Northwest Wildfire Coordinating Group. Coordination of firefighting resources also occurs under Oregon's *Emergency Conflagration Act* that allows the state fire marshal to mobilize and dispatch structural firefighting personnel and equipment when a significant number of structures are threatened by fire and local structural fire-suppression capability is exhausted (OSFM 2007).

Table B-9. Fire Suppression Responsibilities in Oregon

Who	Where	Miles of Proposed Corridor
City fire departments and rural fire protection districts in mutual aid with Oregon Department of Forestry	Structures in Oregon's wildland interface areas covered by mutual-aid agreements. Rangeland fire protection associations on rangeland areas of eastern Oregon outside of both a forest protection district and a rural fire district.	203.7
BLM and BOR	National System of Public Lands and BOR managed lands	70
USFS	National Forest and National Grasslands	5.9

BLM – Bureau of Land Management; BOR – Bureau of Reclamation; USFS – U.S. Department of Agriculture Forest Service
Source: ODEQ 2003

If IPC becomes aware of an emergency situation that is caused by a fire on or threatening BLM-managed or National Forest lands and that could damage the transmission lines or their operation, they will notify the appropriate agency contact. Specific construction-related activities and safety measures will be implemented during construction of the transmission line to prevent fires and to ensure quick response and suppression if a fire occurs. Typical practices to prevent fires during construction and maintenance/repair activities include brush clearing prior to work, posting a fire watch, and stationing a water truck at the job site to keep the ground and vegetation moist in extreme fire conditions, enforcing red flag warnings, providing "fire behavior" training to all construction personnel, keeping vehicles on or within designated roads or work areas, and providing fire suppression equipment and emergency notification numbers at each construction site.

IPC will require its contractor to maintain a list, to be provided to local fire-protection agencies, of all equipment that is either specifically designed for, or capable of, being adapted to fighting fires. IPC will require its contractor to provide basic fire-fighting equipment on-site during construction, including fire extinguishers, shovels, axes, and other tools in sufficient numbers so each employee on-site can assist in the event of a fire-fighting operation.

During transmission line operation, the risk of fire danger is minimal. The primary causes of fire on the ROW result from unauthorized entry by individuals for recreational purposes and from fires started outside the ROW. In the latter case, authorities can use the ROW as a potential firebreak. During transmission line operation, access to the ROW will be restricted in accordance with jurisdictional agency or landowner requirements to minimize recreational use of the ROW.

During maintenance operations, IPC or its contractor will equip personnel with basic fire-fighting equipment, including fire extinguishers and shovels as described above. Maintenance crews will also carry emergency response/fire control phone numbers.

Exhibit U, Section 3.3 provides specific information on the effect of the Project on public and private fire protection providers. Attachment U-3 of Exhibit U contains a Project-specific fire prevention plan that outlines responsibilities, notification procedures, fire prevention measures and precautions, fire suppression equipment, and initial response procedures.

3.3 Related and Supporting Facilities

> **OAR 345-021-0010(1)(b)(B)**
> A description of major components, structures and systems of each related or supporting facility.

Permanent and temporary related and supporting facilities include access roads, multi-use areas (including batch plants), pulling and tensioning sites, and fly yards. This section also addresses concrete and aggregate source sites.

3.3.1 Distribution Lines

Facility service power will be required at the Alternate Horn Butte Substation and at all communication station sites.[20] Power will exist at the Grassland and Longhorn substations by the time construction is anticipated. Typically, facility service power is provided from a local electric distribution line located in proximity to the substation or communication station site. The voltage of the distribution supply line is typically 34.5-kV or lower and carried on wood poles. The location of the service power lines is identified in Exhibit C, Table C-15 and the location is shown on the maps in Exhibit C, Attachment C-2.

3.3.2 Access Roads

The Project will require vehicular access during construction to each substation, communication station site, and transmission structure as well as temporary vehicular access to temporary facilities including multi-use areas and fly yards. Following construction, roads connecting to multi-use areas and fly yards will be removed and restored to preconstruction conditions. For the purposes of establishing the Site Boundary and calculating ground disturbance, access roads fall into two categories: existing roads needing improvement and new roads. Both categories of access roads are shown on maps in Exhibit C, Attachment C-2.

During construction the largest of the heavy equipment needed, which dictates the minimum needed road dimensions, is a truck-mounted aerial lift crane with 100,000 pounds gross vehicle weight, 8-by-8 drive, and a 210-foot telescoped boom. To accommodate this equipment, the road specifications require a 14-foot-wide travel surface and 16- to 20-foot-wide travel surface for horizontal curves. The required travel way in areas of rolling to hilly terrain will typically require a wider disturbance to account for cuts and fills. An average disturbance corridor of 30 feet was used to calculate temporary construction disturbance for new roads and existing roads needing improvement.

[20] Each communication station will require electric power service. IPC will request electric service from the local service provider, and that service provider will be responsible for the permitting and construction required to extend the closest local distribution line to the new communication station. It is IPC's position that these distribution lines do not fall within the definition of "related and supporting facilities" in ORS 469.300(24) because they are not now, and will not be, "proposed by the applicant." Based on preliminary informal direction from ODOE, IPC has included the distribution lines in the Project Site Boundary for this Preliminary ASC. However, IPC will remove the distribution lines from its ASC upon receipt of additional guidance from ODOE confirming that the distribution lines are not "related and supporting facilities" subject to EFSC jurisdiction.

During operations, all new and improved roads, except those to the temporary multi-use areas and fly yards, will be retained. These roads will be used to conduct maintenance using live-line maintenance techniques, thereby avoiding an outage to the critical transmission line infrastructure. High-reach bucket trucks along with other equipment will be used to conduct these activities. An average disturbance corridor of 14 feet was used to calculate permanent operations disturbance for new roads and existing roads needing improvement.

3.3.3 Multi-use Areas

Construction of the Project will begin with the establishment of multi-use areas. The multi-use areas will serve as field offices; reporting locations for workers; parking space for vehicles and equipment; and sites for material delivery and storage, fabrication assembly of towers, cross arms and other hardware, concrete batch plants, and stations for equipment maintenance. Limited helicopter operations may be staged out of multi-use areas. Multi-use areas, about 20 acres each for 500-kV construction and 10 acres each for 138/69-kV construction, will be located approximately every 25 miles along the corridor. Exact locations within the Site Boundary for multi-use areas will be developed during the detailed design phase. Preliminary locations are listed in Exhibit C, Table C-16 and shown on maps in Exhibit C, Attachment C-2.

3.3.4 Pulling and Tensioning Sites

Pulling and tensioning sites (Figure B-12) for 500-kV construction will be required approximately every 1.5 to 2 miles along the ROW and at angle points greater than 30 degrees and will require approximately 5 acres at each end of the wire section to accommodate required equipment. The 138/69-kV pulling and tensioning sites will be required approximately every 1 to 2 miles along the ROW and will require approximately 1 acre each to accommodate required equipment. Equipment at sites required for pulling and tensioning activities will include tractors and trailers with spooled reels that hold the conductors and trucks with the tensioning equipment. To the extent practicable, pulling and tensioning sites will be located within the ROW. However, angle points typically necessitate pulling and tensioning sites outside of the ROW. Depending on topography, minor grading may be required at some sites to create level pads for equipment. Preliminary locations are shown in Exhibit C, Attachment C-2.

3.3.5 Fly Yards

Helicopters operating from fly yards may be used to support construction activities. Fly yards will be 10 to 15 acre sites located every 5 to 10 miles. The construction contractor may choose to construct using ground-based techniques, and not use fly yards. Conversely, the contractor may use helicopters more extensively in which case approval will be requested for use of these additional sites when the need becomes known. Project construction activities potentially facilitated by helicopters may include delivery of construction laborers, equipment, and materials to structure sites; structure placement; hardware installation; and wire stringing operations. Helicopters may also be used to support the administration and management of the Project by IPC. Where construction access by truck is not practical due to steep terrain, all-terrain vehicle trails may be utilized to support maintenance activities. The use of helicopter construction methods for this Project will not change the length of the access road system required for operating the Project because vehicle access is required to each tower site for operations, regardless of the construction method employed. Exact locations within the Site Boundary for fly yards will be developed during the detailed design phase. Preliminary locations are listed in Exhibit C, Table C-17 and shown on maps in Exhibit C, Attachment C-2. For the purpose of disturbance calculations, use of helicopter fly yards was assumed for the full length of the transmission line route.

3.3.6 Concrete Source Sites

In general, concrete used to install structure foundations will be purchased from commercial concrete suppliers. Exhibit G, Attachment G-1 is an inventory of commercial aggregate plants in the driving vicinity of portions of the proposed and alternate corridors. In these more developed areas of the Project, the contractor may use local concrete providers to deliver concrete to the structure sites, if feasible. In more remote portions of the proposed and alternate corridors where driving time would be too long for concrete to maintain specification, concrete will be produced and dispensed from portable concrete batch plants located in multi-use areas. The plant will occupy 3 to 5 acres each within the typically 20-acre multi-use areas. Concrete will be delivered to structure sites in concrete trucks with a capacity of up to 10 cubic yards.

3.3.7 Aggregate Source Sites

Sand and gravel material required for the Project will be purchased from commercial aggregate suppliers in the local area. IPC has inventoried the locations of commercially available gravel and determined that there are enough sites with reasonable proximity to Proposed Corridor and alternate corridor segments.

3.4 Approximate Dimensions

OAR 345-021-0010(1)(b)(C)
The approximate dimensions of major facility structures and visible features.

Table B-10 describes the dimensions of facility structures and visible features. The final quantity, heights, span lengths, and clearances provided by the structures and ROW widths will depend on the final detailed design of the transmission line.[21]

Table B-10. Project Structures and Visible Feature Dimensions

Facility	Description
Proposed Grassland Substation Expansion	• Expansion of planned PGE substation. • The fenced area of the planned PGE substation will be expanded by approximately 3 acres in order to terminate the Project. • Existing access road. • 500-kV circuit breakers and related switching equipment. • Bus and support structures. • 500-kV line termination structures approx. 135 feet in height. • Control, protection, and communications equipment added inside the planned control building. • 500-kV series capacitor bank. • 500-kV shunt reactor bank. • Existing distribution line.

[21] Note that diagrams of structures in this exhibit are not drawn to scale relative to each other.

Table B-10. Project Structures and Visible Feature Dimensions (continued)

Facility	Description
Alternate Horn Butte Substation	• Construction of a new substation. • The fenced area will be approximately 20 acres to accommodate three line terminals: the Project, a line from PGE's Boardman Generating Plant, and a line to the Slatt Substation. • New all-weather access road. • 500-kV circuit breakers and related switching equipment. • Bus and support structures. • 500-kV line termination structures approx. 135 feet in height. • Control, protection, and communications equipment added inside the new control building. • 500-kV series capacitor bank. • 500-kV shunt reactor bank. • Construction of 0.5 mile electric distribution line.
Alternate Longhorn Substation Expansion	• Expansion of BPA planned substation. • Existing access road. • The fenced area of the planned BPA substation will be expanded by approximately three acres in order to terminate the Project. • 500-kV circuit breakers and related switching equipment. • Bus and support structures. • 500-kV line termination structures approx. 135 feet in height. • Control, protection, and communications equipment added inside the planned control building. • 500-kV series capacitor bank. • 500-kV shunt reactor bank. • Existing electric distribution line.
Proposed Single-Circuit Lattice for 500-kV Line 	• Proposed 500-kV structure type: Self-supported steel lattice towers having a dulled galvanized steel finish. • Line length: 277.2 miles in Oregon. • Approximate number of lattice structures: 1,150. • ROW width: up to 250 feet. • Approximate 1,200- to 1,300-foot span distance between lattice structures. • Two Shield Wires: One optical ground wire (OPGW) containing 48 fibers and having an approximate diameter of 0.646 inch. One overhead ground wire (OHGW) made of extra high strength (EHS) steel and having an approximate diameter of 0.5 inch. • Structure heights: lattice tower and monopole varies between 110 and 195 feet and tubular steel h-frame varies between 100 and 165 feet Minimum ground clearance (typical): 37 feet. • Minimum ground clearance over agricultural areas: 40 feet. • Three-phase 500-kV construction for all tower designs, conductor spacing, and clearances. • Conductors: Triple-bundled aluminum conductor steel reinforced (ACSR), with three subconductors per phase. Non-specular finish.

Table B-10. Project Structures and Visible Feature Dimensions (continued)

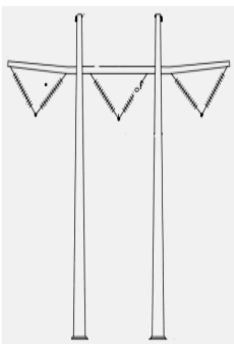
Facility	Description
Alternative Single-Circuit Steel Pole H-Frame or Monopole for 500kV Line (Used only if required to address specific land manager requirements or constraints)  	• Estimated subconductor diameter: 1.345 inches. • Bundle spacing: Subconductor bundle has a spacing of 25 inches between horizontal subconductors and 18 inches of diagonal spacing between the top two subconductors and the lower subconductor. • Alternative 500-kV structure types: Self-supported tubular steel H-frame and/or self-supported monopole structures both having a weathering steel (Cor-ten) finish. • .Approximate 900 to 1,300 feet span distance between H-frame structures. Monopole structure span length is 600 to 1,000 feet. • Number of poles per H-frame: Tangent and small angle H-frame structures will require two poles per structure. Medium and large angle structures as well as deadends will require three poles per structure. • Approximate tubular steel pole diameters: H-Frame Structures = 48 to 72 inches (at base), 16 to 24 inches (at tip): Monopole Structures = 54 to 78 inches (at base), 16 to 24 inches (at tip). • The final quantity, heights, span lengths, and clearances provided by the structures and ROW widths will depend on the final detailed design of the transmission line. • The final quantity, heights, span lengths, and clearances provided by the structures and ROW widths will depend on the final detailed design of the transmission line.

Table B-10. Project Structures and Visible Feature Dimensions (continued)

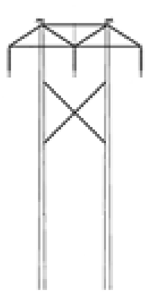
Facility	Description
Proposed Double Circuit 138/69-kV Line with 12.5-kV Underbuild Distribution  *Applicable to rebuild portion of Proposed Corridor*	• Alternative 138/69-kV Structure type: Self-supported tubular steel poles with 12.5-kV underbuild distribution having a weathering steel (Cor-ten) steel finish.. • Approximate tubular steel pole diameters: Monopole Structures = 36 to 54 inches (at base), 10 to 18 inches (at tip). • Structure heights: Variable between 55 and 100 feet. • Approximate span distance between structures: 350 feet (average) • Approximate number of structures: 75. • ROW width for double-circuit: up to 100 feet. • Approximate number of structures: 75. • Conductors: 397 KCM 26/7 ACSR “Ibis” (138-kV, one conductor per phase), 4/0 6/1 ACSR “Penguin” (69-kV, one conductor per phase), 2/0 ACSR “Quail (12.5-kV Distribution, one conductor per phase plus neutral). • Conductor Spacing: typical vertical spacing of 8 feet between shield wire and uppermost 69- and 138-kV phase wires, 6 feet vertical spacing between phase wires, minimum of 12’ between lowermost 138and 69-kV phase wires and distribution cross arm. Customized spacing may be required on some structures to address span or terrain limitations. • Shield Wire: one OHGW consisting of EHS steel and having an approximate diameter of 0.375 inch. • Minimum design ground clearance(typical): 22.0 feet (to 12.5kV distribution) • Line length: Approximately 5.3 miles including 0.3 miles of single-circuit 138-kV line relocation. Due to the short 0.3 mile distance of the 138-kV relocation no further information is provided on this structure. • The final quantity, heights, span lengths, and clearances provided by the structures and ROW widths will depend on the final detailed design of the transmission line.
Single-Circuit 230-kV Transmission Line  *Applicable to rebuild portion of Flagstaff Alternate*	• Proposed structure type: Self-supported light-duty tubular steel H-frame structures having a weathering steel (Cor-ten) finish. • Number of poles per H-frame: Tangent and small angle H-frame structures will require two poles per structure. Medium and large angle structures as well as deadends will require three poles per structure. • Structure heights: varies between 50 and 90 feet. • Approximate span distance between structures: 600-800 feet. • ROW width: nomimal 125 feet. • Conductors: 795 KCM 26/7 “Drake”, one conductor per phase, non-specular finish. • Two EHS steel overhead ground wires with a diameter of approx. 0.375 inch. • Minimum ground clearance: 27 feet. • The final quantity, heights, span lengths, and clearances provided by the structures and ROW widths will depend on the final detailed design of the transmission line.

Table B-10. Project Structures and Visible Feature Dimensions (continued)

Facility	Description
Communication Stations and Fiber Optic Cable	• Communication stations are required to amplify the system control and monitoring signals carried over the fiber optic cable attached to the transmission towers. • A total of up to eight communication stations in addition to existing or proposed substations will be needed for the Project. Most of the locations for the communication stations will be on private property and the final locations determined after the final corridor is identified and detailed design engineering is completed. A few sites may need to be located on public land. • Communication stations are approximately 100 feet by 100 feet with a 75-foot by 75-foot fenced area. • Typical building dimensions within the fenced area will be 11.5 feet wide by 32 feet long by 12 feet tall. • Construction disturbance is assumed to be .2 acres and operational requirement to be 0.1 acre per site. • The fiber OPGW cables supported on the transmission structures will be in common corridor between the communication station building and the nearest transmission structure; either underground or overhead. • Electronic equipment, required to support the fiber optic cable installation, will be located inside the building. • At sites not within a substation, a liquid propane fueled emergency generator will be installed to provide backup power during an outage of the local electric distribution system supply. • Maximum communication station spacing is approximately 40 miles or less depending on access and proximity to local electric distribution lines. • The primary siting criteria for a communication station will be: adjacent to the Project transmission line ROW, proximity to existing low-voltage electric distribution lines to provide power to the facility, and the ability to easily access the site by vehicle. • Distribution lines to communication stations will depend on final location.
Other facilities	• Multi-use areas will serve as field offices, reporting locations for workers, parking space for vehicles and equipment, sites for material storage, fabrication assembly and stations for equipment maintenance, and concrete batch plants. Multi-use areas will be approximately 20 acres in size and located every 20 to 30 miles along the corridor. • Access roads will be permanent or temporary depending on the purpose they serve. To accommodate this equipment, the road specifications require a 14-foot-wide travel surface and 16- to 20-foot-wide travel surface for horizontal curves. The required travel way in areas of rolling to hilly terrain will require a wider disturbance to account for cuts and fills. • Fly yards will be 10 to 15 acres located every 5 to 10 miles along the corridor. Values in table assume helicopter construction throughout all single-circuit 500-kV lines. The construction contractor may choose to construct using ground-based techniques, therefore, not utilizing fly yards. • Wiring pulling/tensioning sites will typically be the ROW width x 600 to 900 feet located every 1.5 to 2 miles. Typically, pulling and tensioning sites at angle structures will extend outside of the transmission line ROW.

3.5 Information Required for Transmission Line Projects

3.5.1 Transmission Line Length

> **OAR 345-021-0010(1)(b)(E)**
>
> (i) The length of the pipeline or transmission line.

The Proposed Corridor comprises 277.2 miles of single-circuit 500-kV electric transmission line and a 5.0-mile rebuild of existing 138-kV and 69-kV transmission lines onto double-circuit structures (with relocation of 0.3 mile of a 138-kV transmission line) between Boardman, Oregon, and the Oregon-Idaho border for a total project distance of 282.5 miles.

IPC also proposes alternate corridor segments totaling 134.1 additional miles.

3.5.2 Proposed ROW Width

> (ii) The proposed right-of-way width of the pipeline or transmission line, including to what extent new right-of-way will be required or existing right-of-way will be widened.

The corridor within which the proposed ROW will be sited is 500 feet in width. The ROW widths for the 500-kV line using single-circuit steel lattice or alternative H-frame structures and monopole structures will be up to 250 feet. The ROW width for the 500-kV line using the alternative steel monopole structures will be up to 250 feet although final design could determine a narrower ROW. The ROW width for the 5.0-mile rebuild of existing 138-kV and 69-kV transmission lines onto double-circuit structures and relocation of 0.3 mile of a 138-kV transmission line will be up to 100 feet.

The ROW width for the single-circuit 230-kV relocation portion of the Flagstaff Alternate will be up to 125 feet.

Except as noted, the Project will acquire new ROW for its entire length except where crossing public ROWs.

3.5.3 Where Following Public ROW

> (iii) If the proposed corridor follows or includes public right-of-way, a description of where the facility would be located within the public right-of-way, to the extent known. If the applicant proposes to locate all or part of a pipeline or transmission line adjacent to but not within the public right-of-way, describe the reasons for locating the facility outside the public right-of-way. The applicant must include a set of clear and objective criteria and a description of the type of evidence that would support locating the facility outside the public right-of-way, based on those criteria.

The Project is too large to be located within existing public ROWs. All portions of the Project would be located in private ROWs or new ROW grants or special use authorizations on public land except to the extent the corridor must cross existing public ROWs.

3.5.4 Pipeline Operating Pressure and Delivery Capacity

> (iv) For pipelines, the operating pressure and delivery capacity in thousand cubic feet per day and the diameter and location, above or below ground, of each pipeline.

Not applicable.

3.5.5 Rated Voltage, Load Carrying Capacity Current and Structures

> (v) For transmission lines, approximate transmission line voltage, load carrying capacity and type of current.

Approximate voltage – 500 kV AC

Load carrying capacity – The Project is likely to have a thermal continuous rating of about 3,000 MW for the single-circuit 500-kV line. However, due to reliability standards and the WECC's rating process, the initial implementation of the facility is likely to result in directional ratings of 1,400 MW east to west and 1,300 MW west to east. These ratings will result in an increase of the Idaho to Northwest (the Idaho to Northwest rated path and the Project) transfer capability of 250 MW from east to west (exports into the Pacific Northwest), and 850 MW from west to east (imports into IPC's balancing authority area). When combined with other proposed projects under development to the east, the east to west transfer capability of the Idaho to Northwest increases by 1,400 MW. The ratings are subject to technical peer review and will be revisited as other regional projects continue to develop.

Type of Current – alternating current (AC)

Transmission Structures and Dimensions – See Section 3.2.2.1, Tables B-7 and B-10, and Figures B-13 through B-19.

3.6 Construction Schedule

> **OAR 345-021-0010(1)(b)(F)** A construction schedule including the date by which the applicant proposes to begin construction and the date by which the applicant proposes to complete construction. Construction is defined in OAR 345-001-0010. The applicant shall describe in this exhibit all work on the site that the applicant intends to begin before the Council issues a site certificate. The applicant shall include an estimate of the cost of that work. For the purpose of this exhibit, "work on the site" means any work within a site or corridor, other than surveying, exploration or other activities to define or characterize the site or corridor, that the applicant anticipates or has performed as of the time of submitting the application.

As shown in Figure B-22, construction will involve one engineer, procure, construct (EPC) contract with two construction spreads (line sections) for the transmission line and division of the Project into discrete construction phases. Work is projected to begin simultaneously in more than one section with material marshaling, ROW clearing, and road and site work, starting first, then foundation installation, tower erection, and wire stringing. The substation/substation expansion construction and the communication station work will begin on a schedule that will allow for completion at approximately the same timeframe as the transmission line. All construction activity is expected to be completed for an in-service date that is expected to be no sooner than 2018. No work on the site as defined in OAR 345-001-0010 will take place before EFSC issues a Site Certificate.

B2H Project Preliminary Construction Schedule (Oregon Facilities Only)

ID	Name	Start	Finish
1			
2	**EFSC Site Certificate Award**	**Thu 10/8/15**	**Thu 10/8/15**
3	**Conditions Compliance**	**Thu 10/8/15**	**Wed 1/27/16**
4	**Design, ROW Activities and Material Procurement**	**Fri 2/21/14**	**Thu 10/8/15**
5	**Line Section 1**	**Thu 1/28/16**	**Tue 8/7/18**
6	Mobilization, Sect 1	Thu 1/28/16	Wed 3/30/16
7	Material Marshalling	Thu 3/31/16	Wed 5/24/17
8	ROW Clearing	Thu 3/31/16	Thu 4/27/17
9	Road/Tower Sitework	Thu 3/31/16	Thu 4/27/17
10	Foundation Const	Thu 4/28/16	Tue 8/15/17
11	Tower Lacing	Thu 7/21/16	Wed 5/2/18
12	Tower Setting	Thu 9/15/16	Tue 12/26/17
13	Wire Stringing	Thu 9/29/16	Tue 8/7/18
14	Comm Stations	Thu 8/3/17	Tue 7/31/18
15	**Line Section 2**	**Thu 1/28/16**	**Tue 2/27/18**
16	Mobilization, Section 2	Thu 1/28/16	Wed 5/11/16
17	Material Marshalling	Thu 5/12/16	Wed 7/5/17
18	ROW Clearing	Thu 5/12/16	Tue 2/7/17
19	Road/Tower Sitework	Thu 5/12/16	Tue 2/7/17
20	Foundation Const	Thu 5/26/16	Tue 10/17/17
21	Tower Lacing	Thu 6/9/16	Tue 12/5/17
22	Tower Setting	Thu 6/23/16	Tue 12/19/17
23	Wire Stringing	Thu 7/7/16	Tue 2/27/18
24	Comm Stations	Thu 1/19/17	Tue 2/27/18
25	**Boardman Area Terminu:**	**Wed 8/3/16**	**Tue 8/7/18**
26	Civil Site Work	Wed 8/3/16	Tue 7/18/17
27	Structures/Buswork	Wed 5/17/17	Tue 1/23/18
28	Equipment	Wed 6/14/17	Tue 2/20/18
29	Control Bldg/Panels	Wed 7/12/17	Tue 6/26/18
30	Test & Comm	Wed 5/16/18	Tue 8/7/18
31	**Project In Service**	**Tue 8/7/18**	**Tue 8/7/18**
32	**Clean Up**	**Thu 11/2/17**	**Thu 12/6/18**

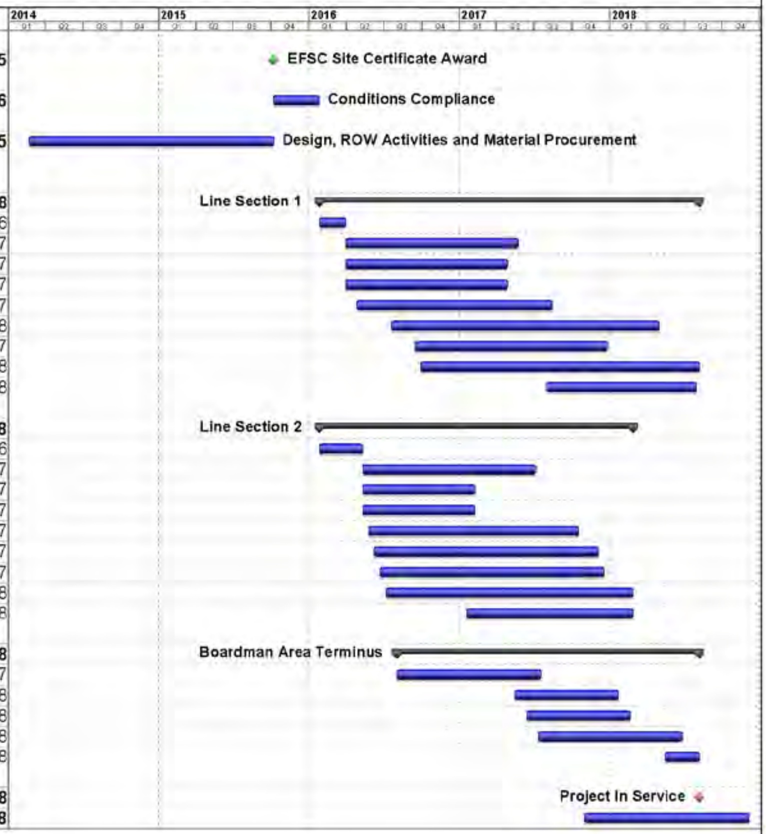


Figure B-22. Construction Schedule

3.7 Limitations on Use of the Right-of-Way (Project Order Comments)

The Project Order states that "The application must explain in detail what limitations are placed on property owners in the transmission line right of way" (Project Order Section V(b), page 16). After the transmission line has been energized, agricultural and non-agricultural land uses that are compatible with safety regulations will be permitted in the ROW, subject to limitations. Limitations on uses include restrictions on placing buildings or structures within the ROW; restrictions on the use of equipment taller than 15 feet under the transmission line or around towers except as noted below; restrictions on crops that can grow to over 15 feet at maturity (such as timber) within 25 feet of the outermost phase conductor; restrictions on storage of flammable materials of any kind on the ROW; restrictions on refueling equipment under the transmission line; restrictions on grading, land recontouring, and material stockpiling under the transmission line or near structure locations; and required coordination with IPC for the construction of fences, irrigation lines, or other facilities that could be subject to induced current and for the use of agricultural equipment taller than 20 feet. See Exhibit K, Attachment K-1 (Agricultural Assessment), Appendix B (Agricultural Impacts Mitigation Plan), Exhibit P, Attachment P-5 (Vegetation Management Plan), and Exhibit AA (Electric and Magnetic Fields) for additional discussions regarding land uses within the ROW.

4.0 CONCLUSIONS

Exhibit B provides a detailed description of the Project, as required by OAR 345-021-0010(1)(b), paragraphs (A) through (F). The description provides sufficient detail for members of the public and reviewing agencies to make informed comments and includes presentation of comprehensive explanation of how the Proposed Corridor and alternate corridor segments were chosen and what consideration was given the siting factors under OAR 345-021-0010(1)(b)(D) as well as the analysis required by ORS 215.275.

5.0 SUBMITTAL AND APPROVAL COMPLIANCE MATRICES

Table B-11 provides a cross reference between Exhibit submittal requirements of OAR 345-021-0010 and where discussion can be found in the Exhibit.

Table B-11. Submittal Requirements Matrix

Requirement	Location
OAR 345-021-0010(1)(b)	
(b) **Exhibit B.** Information about the proposed facility, construction schedule and temporary disturbances of the site, including:	All sections
(A) A description of the proposed energy facility, including as applicable:	Section 3.2
(i) The nominal electric generating capacity and the average electrical generating capacity, as defined in ORS 469.300.	Section 3.2.1
(ii) Major components, structures and systems, including a description of the size, type and configuration of equipment used to generate electricity and useful thermal energy.	Section 3.2.2
(iii) A site plan and general arrangement of buildings, equipment and structures.	Section 3.2.3
(iv) Fuel and chemical storage facilities, including structures and systems for spill containment.	Section 3.2.4
(v) Equipment and systems for fire prevention and control.	Section 3.2.5
(vi) For thermal power plants:	Not Applicable
(vii) For surface facilities related to underground gas storage, estimated daily injection and withdrawal rates, horsepower compression required to operate at design injection or withdrawal rates, operating pressure range and fuel type of compressors.	Not Applicable
(viii) For facilities to store liquefied natural gas, the volume, maximum pressure, liquefaction and gasification capacity in thousand cubic feet per hour.	Not Applicable
(B) A description of major components, structures and systems of each related or supporting facility.	Section 3.3
(C) The approximate dimensions of major facility structures and visible features.	Section 3.4

Table B-11 Submittal Requirements Matrix (continued)

Requirement	Location
(D) If the proposed energy facility is a pipeline or a transmission line or has, as a related or supporting facility, a transmission line or pipeline that, by itself, is an energy facility under the definition in ORS 469.300, a corridor selection assessment explaining how the applicant selected the corridor(s) for analysis in the application. In the assessment, the applicant shall evaluate the corridor adjustments the Department has described in the project order, if any. The applicant may select any corridor for analysis in the application and may select more than one corridor. However, if the applicant selects a new corridor, then the applicant must explain why the applicant did not present the new corridor for comment at an informational meeting under OAR 345-015-0130. In the assessment, the applicant shall discuss the reasons for selecting the corridor(s), based upon evaluation of the following factors:	Sections 3.1, 3.1.1–3.1.3
(i) Least disturbance to streams, rivers and wetlands during construction;	Section 3.1.4
(ii) Least percentage of the total length of the pipeline or	Section 3.1.4
(iii) Greatest percentage of the total length of the pipeline or transmission line that would be located within or adjacent to public roads, as defined in ORS 368.001, and existing pipeline or transmission line rights-of- way;	Section 3.1.4
(iv) Least percentage of the total length of the pipeline or	Section 3.1.4
(v) Least percentage of the total length of the pipeline or transmission line that would be located in a protected area as described in OAR 345-022-0040;	Section 3.1.4
(vi) Least disturbance to areas where historical, cultural or archaeological resources are likely to exist; and	Section 3.1.4
(vii) Greatest percentage of the total length of the pipeline or transmission line that would be located to avoid seismic, geological and soils hazards;	Section 3.1.4
(viii) Least percentage of the total length of the pipeline or transmission line that would be located within lands zoned for exclusive farm use;	Section 3.1.4
(E) For any pipeline or transmission line, regardless of size:	Section 3.5
(i) The length of the pipeline or transmission line.	Section 3.5.1
(ii) The proposed right-of-way width of the pipeline or transmission line, including to what extent new right-of-way will be required or existing right-of-way will be widened.	Section 3.5.2
(iii) If the proposed corridor follows or includes public right-of-way, a description of where the facility would be located within the public right- of-way, to the extent known. If the applicant proposes to locate all or part of a pipeline or transmission line adjacent to but not within the public right-of-way, describe the reasons for locating the facility outside the public right-of-way. The applicant must include a set of clear and objective criteria and a description of the type of evidence that would support locating the facility outside the public right-of-way, based on those criteria.	Section 3.5.3
(iv) For pipelines, the operating pressure and delivery capacity in thousand cubic feet per day and the diameter and location, above or below ground, of each pipeline.	Section 3.5.4

Table B-11 Submittal Requirements Matrix (continued)

Requirement	Location
(v) For transmission lines, the rated voltage, load carrying capacity, and type of current and a description of transmission line structures and their dimensions.	Section 3.5.5
(F) A construction schedule including the date by which the applicant proposes to begin construction and the date by which the applicant proposes to complete construction. Construction is defined in OAR 345-001-0010. The applicant shall describe in this exhibit all work on the site that the applicant intends to begin before the Council issues a site certificate. The applicant shall include an estimate of the cost of that work. For the purpose of this exhibit, “work on the site” means any work within a site or corridor, other than surveying, exploration or other activities to define or characterize the site or corridor that the applicant anticipates or has performed as of the time of submitting the application.	Section 3.6
Project Order Section VI(b) Comments	
The description of the proposed facility in the application will form the basis for the description of the facility in the site certificate. The site certificate will require that IPC will build the facility “substantially as described.” Exhibit B will also provide the basis for the project description in the notice of application that ODOE will issue to reviewing agencies and public. Therefore, Exhibit B should describe the project in enough detail for members of the public and reviewing agencies to make informed comments. It should describe the project sufficiently for ODOE staff to verify that the constructed project will meet any representations that are the basis for any findings of compliance with applicable regulations for standards, but need not include descriptive material that IPC would not want to be held to in a condition.	Sections 3.2–3.6
The application must clearly describe the width of the corridor in which the micrositing corridor right-of-way would be sited along the length of the proposed line. The application must specify the width of the permanent right-of-way IPC will request, and must justify that width. The Council may direct IPC to acquire a narrower right-of-way in areas that are important for agriculture or for habitat, and it may allow a wider right-of-way at certain locations for staging areas. The application must also explain in detail what limitations would be placed on the property owner in the transmission line right-of-way.	Sections 3.2.2 and 3.5.2
The alternatives analysis described in section OAR 345-021-0010(1)(b)(D) must be consistent with the analysis required by ORS 215.275 and the required information in this rule. The Council recognizes that some of the factors in this rule compete with one another (for example, the requirements to both avoid habitat land and avoid farm land), but expects the application to demonstrate that all required factors were considered.	Sections 3.1, 3.1.1, 3.1.2, 3.1.3, and 3.1.4, and Exhibit K, Section 3

6.0 RESPONSE TO COMMENTS FROM THE PUBLIC AND REVIEWING AGENCIES

Table B-12 provides a cross reference between comments cited in the Project Order from the public and reviewing agencies and where discussion can be found in the Exhibit.

Table B-12. Public and Reviewing Agency

Comments	Location
Not Directly Related to an EFSC Standard Commenters expressed many concerns about specific corridors proposed in the NOI. The Department understands that the corridor proposed in the ASC might differ from that ultimately proposed in the ASC, but the applicant should ensure that the corridor selection analysis is included in Exhibit B.	Section 3.1, Attachments B-1 through B-3

7.0 REFERENCES

IEEE (Institute of Electrical and Electronics Engineers). 2011. 2012 National Electrical Safety Code. August 1. ISBN: 9780738165882.

IPC (Idaho Power Company). 2011. 2011 Integrated Resource Plan. June. Available online at: http://www.idahopower.com/pdfs/AboutUs/PlanningForFuture/irp/2011/2011IRPFINAL.pdf

ODEQ (Oregon Department of Environmental Quality). 2003. Oregon Natural Hazards Mitigation Plan. Revised August 19. Available online at: http://www.deq.state.or.us/aq/burning/wildfires/neap/appendixD.pdf

ODFW (Oregon Department of Fish and Wildlife). 2011. *Greater Sage-Grouse Conservation Assessment and Strategy for Oregon: A Plan to Maintain and Enhance Populations and Habitat*. Oregon Department of Fish and Wildlife. Primary author Chris Hagen. April 22. Available online at: http://www.dfw.state.or.us/wildlife/sagegrouse/docs/20110422_GRSG_April_Final%2052511.pdf

OSFM (Orego State Police – Oregon Office of State Fire Marshal). 2007. "Conflagration FAQs: What is the Conflagration Act?" [Internet]. Available online at: http://www.oregon.gov/OSP/SFM/Pages/Conflagration_Information_2007.aspx

OPRD (Oregon Parks and Recreation Department). 2011. E-mail from Jim Hutton (OPRD) to Keith Georgeson (IPC) dated March 22, 2011, concerning Oregon Parks and Recreation property.

OPRD. 2012. Memorandum from Alice Beals (OPRD) to Sue Oliver (ODOE) dated October 8, 2012, concerning Blue Mountain Forest State Scenic Corridor.