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## Short-Term (Construction) Impacts and Potential Mitigation

# CHAPTER 5. SHORT-TERM (CONSTRUCTION) IMPACTS AND POTENTIAL MITIGATION

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This chapter describes short-term (construction) impacts that could result from construction of PSE's Proposed Alignment. Under the No Action Alternative, no construction would occur; therefore, the No Action Alternative is not evaluated below. For the purposes of this Final EIS, impacts associated with routine maintenance of the existing transmission lines (e.g., occasional replacement or repair of poles, wires, and related equipment, and associated access disturbance) are assessed as part of Chapter 4, *Long-Term (Operation) Impacts and Potential Mitigation*.



## 5.1 LAND USE AND HOUSING

### 5.1.1 Short-term (Construction) Impacts Considered

The magnitude of short-term project-related impacts to land use and housing is classified as being less-than-significant, or significant as follows:

- **Less-than-Significant** – Construction activities are disruptive (e.g., noise and dust are generated) but not to the extent that current use of the property is altered and is for a duration that would not infringe on the use or access of the parcel or housing structures thereupon.
- **Significant** – Construction activities are disruptive and/or continue for an interval long enough to infringe on the current use of the parcels in the study area by causing a nuisance (e.g., noise, dust, etc.) that changes the use of the land or by impeding access to the parcels or housing structures thereupon.

### 5.1.2 Short-term (Construction) Impacts: PSE's Proposed Alignment

Construction of the project would entail the installation of poles and stringing of conductor wires. According to PSE, pole installation requires 3–14 days each (within a 2-month work window), no significant excavation is required, access to adjacent land uses would be maintained, and installation would not create significant noise, provided that the project complies with local noise regulations. Any nuisance caused by the construction activities of PSE's Proposed Alignment would be less than significant due to the relatively short duration of the impacts in any one location.

In general, PSE does not anticipate the need to evacuate homeowners during construction. At some locations, however, access may be more difficult due to terrain, vegetation, topography, or existing structures, and cranes or helicopters could facilitate construction by lifting pole sections over buildings. This type of construction could reduce the duration and extent of impacts on adjacent uses and is described under mitigation below.

PSE and the construction contractor would coordinate directly with affected land owners regarding replacing fences and ancillary structures that are either removed or disturbed, tree removal and/or pruning, temporary evacuation, and other construction-related access issues consistent with conditions established by permitting requirements.

### 5.1.3 Mitigation Measures

Short-term (construction) land use impacts would be less-than-significant. However, the following measure could be implemented to reduce construction-related site disturbance, construction duration, or inconvenience for adjacent land uses.

#### *During Construction*

- In locations where access is difficult, a helicopter or large crane could be used to lift foundation rebar and/or poles over adjacent properties and into place. Helicopters could also be used to facilitate stringing the new transmission line into place, reducing the need to enter property to feed the initial lead line (called a “sock line”) that is used to pull the actual conductors into place.

The decision to use a large crane or helicopter is usually determined by the construction contractor to address access concerns and minimize site disturbance. Use of a helicopter for this purpose is regulated by the Federal Aviation Administration (FAA). A “congested air” permit and advance notification are required. Because of the potential impacts of this type of construction, local regulators may also want to limit where this type of construction would be allowed. Appendix A-3 includes a series of questions and answers about helicopter use. Following is a brief summary of considerations regarding this type of construction.

- Helicopter use for stringing the sock line takes only a few minutes per pole, for each conductor. It involves flying directly over the poles and would not likely involve suspending anything over occupied buildings or homes.
- If a crane or helicopter were used to install poles, it would require occupants of buildings or homes in the path of the poles being transported to vacate the premises for up to 2 hours at a time during daylight working hours.
- Helicopters generate substantial noise that is not regulated by local codes. Appendix A-4 includes a table that shows expected noise levels.
- Helicopter use would not eliminate the need for construction access by vehicles for excavation and pouring concrete.



## 5.4 PLANTS AND ANIMALS

The potential effects of short-term (project construction) activities on plant and animal resources in the study area were assessed on the basis of project construction methods, the scale of the construction activities, and the quality and proximity of typical species and habitat resources. The analysis considered the scale of PSE's Proposed Alignment in determining potential impacts to species or their habitats, including noise disturbance, the disturbance or short-term alteration of available habitat, and construction area stormwater runoff.

Impacts were assessed based on the number and type of power transmission facilities installed, amount of ground disturbance during construction, the presence of natural or critical areas, and the proximity of construction areas to known or potential species habitats. These include known or potential nesting, migration, and rearing habitats within the study area.

### 5.4.1 Short-term (Construction) Impacts Considered

The project is expected to cause temporary (short-term) modifications of available fish and wildlife habitat, as well as potential direct impacts to fish and wildlife species. The scale and proximity of construction activities to these resources determined the intensity of potential impacts. The analysis considered the cumulative impacts and potential mitigation measures to minimize or eliminate project impacts to plant and animal resources. For this analysis, the magnitude of short-term impacts is classified as being less-than-significant or significant, as follows:

- **Less-than-Significant**—Impacts to fish and wildlife are considered less-than-significant if project activities would cause temporary, or minor permanent, alterations or disturbances to study area habitats, including impacts that could be minimized but not fully mitigated; occur in developed areas with minimal or poor quality habitat; or when impacts are mitigated through compliance with tree protection or critical areas ordinances. This would include limited interference with the breeding, feeding, or movement of resident or migratory fish, bird, amphibian, or mammal species. This would also include activities that could cause harassment, injury, or death to common species, whose populations would not be substantially altered by such impacts.
- **Significant**—Impacts are considered significant where construction activities would cause the following: injury, death, or harassment of federal and state listed endangered or threatened species, or bald eagle and peregrine falcon (state sensitive and federal species of concern); a reduction of habitat quality or quantity that can substantially affect the critical survival activities (breeding, rearing, and foraging) of listed species; substantial interference with the breeding, feeding, or movement of native resident or migratory fish, bird, amphibian, or mammal species; or noncompliance with tree protection ordinances or critical areas ordinances.

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#### Methods for Analyzing Short-term Impacts

The EIS Consultant Team used the same methods as for long-term (operation) impacts to determine the short-term (construction) impacts to plants and animals in the study area. Impacts were assessed based on the type and scale of construction activities and potential habitat modifications, and the likely presence of protected fish and wildlife species.

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## **5.4.2 Short-term (Construction) Impacts: PSE's Proposed Alignment**

### **5.4.2.1 Short-term (Construction) Impacts Common to All Components**

A range of potential direct and indirect impacts to plants and animals could occur during construction, including the following: noise disturbance, habitat alteration or loss (vegetation clearing), degradation of aquatic habitat, and introduction of invasive plant species.

#### ***Disturbance from Construction Noise and Human Activity***

Increased construction noise and human activity could cause some animal species to temporarily relocate to surrounding habitats, or in some instances to be displaced. This would be a significant adverse impact if listed species are harassed, lost, or permanently displaced. However, the typical construction activities would not cause excessive noise disturbances, and protected wildlife species are not known to occupy habitat within the study area. In addition, construction BMPs would be implemented for PSE's Proposed Alignment to eliminate or substantially reduce impacts.

Most of the construction activities would occur in discrete locations (i.e., individual pole locations) dispersed along the existing corridor. The work areas would typically be limited to the immediate area around the pole locations, where vegetation could be removed to allow a safe working space for equipment, vehicles, and materials. The amount of ground disturbance would be limited. Disturbing these small, isolated areas would require wildlife to move only short distances to avoid direct effects, and limit indirect effects to surrounding habitat. The pole locations would also be chosen to minimize the disturbance of sensitive or critical areas, by typically allowing placement within approximately 25 feet of the existing poles.

**Table 5.4-1. Impacts to Plants and Animals by Segment and Option**

Location/Segment	Short-term Effect	Impact
<b>Redmond Segment</b>		
Noise disturbance from ground-clearing activities	See Section 5.4.2.1, <i>Short-term Impacts Common to All Components</i> .	Less-than-Significant

### **5.4.3 Mitigation Measures**

As described above for long-term impacts, PSE would provide mitigation for potential long-term impacts to fish, wildlife, and plant resources caused by construction, using on- and off-site habitat enhancements, which would be developed in coordination with local, state, and federal agencies (Section 4.4.6). In addition, to mitigate for the short-term impacts described in this chapter, the following mitigation measures would be used during construction to reduce construction-related impacts.

#### **5.4.3.1 Regulatory Requirements**

The following measures are required to comply with regulations and are not discretionary.

##### ***During Construction***

Implementation of the mitigation measures described in Section 5.3.3 to minimize impacts on water resources would also minimize impacts on plants and animals. In addition, PSE would comply with applicable construction windows for in-water work.

PSE would also comply with all requirements of their Joint Aquatic Resources Permit Application (JARPA) imposed by natural resource agencies to protect fish and wildlife species and their habitat, such as:

- Limit work to allowable “fish window” time periods.
- Limit work during sensitive nesting and breeding seasons for protected wildlife species occurring in the area.
- Implement PSE’s established bird protection programs and procedures.
- Provide fish exclusion if required to prevent harm to protected species.
- Replant and stabilize disturbed construction and staging areas with native trees, shrubs, and grasses.
- Implementation of temporary erosion control measures.
- Utilize a Spill Prevention and Control Plan.

#### **5.4.3.2 Potential Mitigation**

##### ***During Construction***

- PSE would continue to implement an ecologically based, integrated weed management program to control the spread of invasive and noxious weeds at disturbed areas by planting native plants.
- Flag the limits of construction, trees to be retained, and critical habitat areas and associated buffers to be avoided.
- At sites where access is difficult, a helicopter or large crane may be used to limit the extent of disturbance necessary for construction access. See the discussion of helicopter use in Section 5.1.3.



## 5.6 RECREATION

### 5.6.1 Short-term (Construction) Impacts Considered

Potential short-term impacts to recreation include the loss of use of a recreation site during construction activities. The following specifically defines short-term impacts to recreation.

**Less-than-Significant** – Impacts would be less-than-significant if a recreation site were not usable for a short duration or if construction activities are noticeable (e.g., decreased visual enjoyment) and cause irritation to users but do not preclude recreation use (e.g., if a trail is closed for 3 to 14 days over a 2-month period while a pole is replaced and the lines are restrung). Impacts would also be less-than-significant if a recreation site were unusable or access completely blocked outside of peak use or in a recreation site or area of a recreation site that is not frequently used (e.g., if construction site access blocks a trail that is located in a park for a 2-month period while all poles in that park are replaced and the lines are restrung). Construction on school property would be less-than-significant if it occurred when school is not in session (e.g., weekends, summertime).

**Significant** – Impacts are considered significant if a recreation site were unusable or access is completely blocked during peak use for an extended period of time (e.g., a park is inaccessible during the summer months and many users are affected). Construction through easements on school property during the school year would be significant if sports and play fields are not available to the students (e.g., a soccer field is inaccessible during a tournament).

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#### Methods for Studying Short-term Impacts

The EIS Consultant Team used the same mapping methods used for long-term (operation) impacts to determine the short-term (construction) impacts. They then considered the type and scale of construction activities, the time of year of construction (e.g., during peak summer use), duration of construction, number of users affected, and type and number of recreation sites affected.

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### 5.6.2 PSE's Proposed Alignment: New Substation and 230 kV Transmission Lines

#### 5.6.2.2 Impacts Common to All Segments

Activities within a recreation site in the vicinity of construction may be limited for the duration of active construction (see Section 2.1.3, *Construction*, for details). For example, where a pole site is located within a park, the portion of the park nearby could be inaccessible for 3 to 14 days while work is being done. If poles and access routes are not located in areas used by recreationists, recreation would not likely be affected. Where a trail is located along PSE's existing corridor and access to a number of poles would be along the corridor, the trail could be temporarily closed or rerouted during active work (i.e., while workers are on-site) until all poles are replaced. For example, if a trail is used to access four pole sites, that trail could be affected for up to 20 days within a 2-month period. The trail could remain open provided it was safe, but users would see construction activities and vehicles on the trail, which may affect user enjoyment. Bicycle and pedestrian use of

roads or sidewalks may be restricted while poles are replaced or constructed along roads. In between active work (i.e., between work stages, including evenings and weekends), areas may have indications of construction (e.g., disturbed soil or a small area cordoned off), but access would be maintained. PSE would work to maintain access to recreation sites while providing a safe working area for crews and the public. Recreation users may relocate to nearby parks during construction, making those parks busier than usual. PSE will try to keep recreation areas open to the extent possible; however, during certain construction activities (e.g., movement of construction equipment), safety is paramount and may require temporary closure of some areas.

Trees and vegetation may be removed within the managed right-of-way within or adjacent to recreation sites to facilitate project construction and access. Grasses, shrubs, and saplings would be disturbed or cleared in areas subject to ground-disturbing activities. Temporary vegetation cleared to facilitate construction will be restored, but areas may be fenced off to allow vegetation to reestablish. Impacts to recreation from permanent changes to vegetation are described in Section 4.6, Recreation.

Construction vehicles may use parking spaces or adjacent street parking. In addition, it is possible that recreation sites or facilities may be used for temporary construction staging. PSE would work with the appropriate cities to identify suitable locations for staging that would result in minimal impacts to recreation. Such suitable locations may include overflow parking areas or parts of the site that are underutilized.

After poles are replaced, the site (including any staging areas) would be restored and available for recreation. Recreation users would be inconvenienced by construction activities; however, impacts would be short in duration at each recreation site and less-than-significant.

Short-term (construction) impacts at specific recreation sites are summarized by segment in Table 5.6-1. As shown, there would be no impacts or less-than-significant impacts at all recreation sites in the study area.

**Table 5.6-1. Short-term Impacts to Recreation Sites in the Study Area by Segment**

Recreation Sites	Short-term Effect	Impact
<b>Redmond Segment</b>		
Willows Crest Park	The parcel adjacent to Willows Crest Park would be used to access 11 pole sites (2 poles per site) on the easement. There would no construction in the park, but users would be disturbed by vehicles driving past the park intermittently for up to 3 months.	Less-than-Significant

Recreation Sites	Short-term Effect	Impact
Willows Creek Neighborhood Park	Construction would not be visible from the park, and there would be no disturbance to the park itself.	No Impact
Trails (unnamed on corridor, between the Sammamish substation and where the corridor turns south)	The trail would be temporarily closed while adjacent poles are replaced. Vegetation may be cleared to facilitate construction. Ten new poles are proposed in the vicinity of the trail. This trail may be closed until all poles are replaced, or users may avoid the area. Given the number of poles, work in this area would likely be continuous for approximately 2 months. As this is not a high use area, impacts would be limited.	Less-than-Significant
Unnamed Trails (on the north-south portion of the corridor)	Trails along the north-south portion of the Redmond Segment may be temporarily closed while adjacent poles are replaced. How long a trail would be affected would depend on proximity to roads and if the trail is needed to access other poles. Vegetation may also be cleared to facilitate construction.	Less-than-Significant
Rose Hill Middle School	Access to playfields would be restricted during active construction while poles and wires are replaced. Two H-frames (four poles) would be removed and replaced with one pole on the school property. Work would take 6 to 14 days. Vegetation clearing during construction would be limited because the area is already cleared. The existing 115 kV lines (part of a different transmission line) and monopoles on the east side of the property would remain.	Less-than-Significant

### **5.6.3 Mitigation Measures**

Required and potential mitigation measures described in Section 4.6.6 have the potential to mitigate construction-related impacts. However, the following construction-specific mitigation measures would also be required or could be imposed to reduce construction impacts to recreational resources. Construction-specific mitigation measures were identified based on discussion with the Partner Cities. Mitigation measures specified during the permitting process, such as use of construction BMPs, would be required, whereas measures suggested by the City of Bellevue or based on comprehensive plan policies would be at the discretion of the applicant to adopt or the local jurisdictions to impose as a condition of project approval.

#### **5.6.3.1 Regulatory Requirements**

The following measure is required.

##### ***During Construction***

- Use BMPs to minimize noise, dust, and other disturbances to visitors to recreation sites during construction, as well as in areas used for informal recreation (e.g., along roads).

#### **5.6.3.2 Potential Mitigation Measures**

##### ***Prior to Construction***

- Coordinate with potentially affected park districts/departments.
- Provide alternative access points to recreation sites and trail detours.
- Avoid construction during months when recreation sites are busier, when possible.
- Avoid vegetation clearing for construction activities where possible.
- Avoid replacing poles at Rose Hill Middle School and Tyee Middle School while school is in session.

- Notify local jurisdictions, schools, or private owners (including the Somerset Recreation Club), 60 days in advance of work within recreation sites.
- Notify the public of any temporary closure of trails or recreations sites 2 weeks in advance.
- Provide signage along trails or park entrances at least 1 week prior to closures.

### ***Post Construction***

- Restore recreation sites or trails after construction.



## 5.7 HISTORIC AND CULTURAL RESOURCES

### 5.7.1 PSE's Proposed Alignment: New Substation and 230 kV Transmission Lines

#### 5.7.1.1 Archaeological Resources (belowground)

Construction impacts to archaeological resources would be an irreversible and permanent impact as these resources are non-renewable, and any impact to the depositional integrity (i.e., context) of a protected archaeological resource would be significant. Therefore, analysis of impacts to protected archaeological resources is addressed as a permanent impact in Section 4.7.

#### 5.7.1.2 Historic Resources (aboveground)

Construction impacts to historic resources would be temporary and could reduce a resource's historic register eligibility or reduce the ability of the resource to convey its historic significance. These impacts could be reversible or irreversible. Reversible impacts would be less-than-significant.

Irreversible impacts would be permanent. As such, these impacts are addressed in Section 4.7. Permanent impacts could occur during construction if increased vibration levels result in structural damage to a significant historic resource. The necessary level of vibration to result in structural damage would be above the standard threshold limits defined in the Federal Transit Administration's Noise and Vibration Impact Assessment (FTA, 2006). The project does not propose work that would result in this level of vibration. Permanent impacts could result from the placement of a new pole within the viewshed of a significant historic resource, demolition of a significant historic resource, or irreversible alterations to contributing resources within a historic district. It is probable that these impacts could be mitigated and therefore are not considered significant.

- **Less-than-Significant**—Less-than-significant construction impacts are defined in this analysis as those that are temporary, reversible, and that do not impact the significant historic resource's historic register eligibility or ability to convey its historic significance. Less-than-significant impacts could temporarily alter a resource's integrity of setting, feeling, or place, but it is probable that these impacts could be mitigated through BMPs that would reduce levels of dust, vibration, and noise.
- **Significant**—Significant construction impacts are defined in this analysis as those that are irreversible and permanent. Because these would result in permanent impacts, analysis is addressed in Section 4.7.

# APPENDIX A-4. ESA TECHNICAL MEMORANDUM ON HELICOPTER NOISE FROM POWERLINE STRINGING AND POLE INSTALLATION

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# Technical memorandum

date January 16, 2018

to Reema Shakra, Project Manager

cc Mark Johnson, Project Director

from Chris Sanchez, Senior Technical Associate

subject Helicopter Noise from the Installation of Transmission Poles and Lines

In response to your e-mail, this memorandum responds to your request for impact analysis of noise from transmission pole/line installations using helicopters. The following is a synopsis of potential noise impacts and how they may apply to elements of the Energize Eastside Project. ESA estimated the 1-hour equivalent sound level (Hourly Leq) values that would be associated with pole/line installations as well as landing zone areas.

It is assumed that the pole installation would be conducted using a heavy duty helicopter, such as CH47D Chinook, and line installation would be conducted using a light duty helicopter, such as Hughes 500D. The Federal Aviation Administration's (FAA) Aviation Environmental Design Tool version 2d (AEDT 2d) includes a set of data called Noise-Power-Distance (NPD) data for both helicopters. NPD data includes A-weighted maximum noise levels (LAMAX) for hovering operations at the distances from 200 feet to 25,000 feet. For this study, the following are used as a reference noise level for helicopter activities:

- CH47D – 86 dBA LAMAX at 200 feet
- H500D – 80 dBA LAMAX at 200 feet

These maximum noise levels were then used to estimate average hourly noise levels associated with helicopter construction activity. For pole installation, it was assumed that a CH47D helicopter would be hovering at one location for the entire hour. For line installation, it was assumed that the H500D helicopter operating time would be approximately 15 minutes per hour at tubular steel pole (TSP) sites during sock line stringing. At the landing zone, it was assumed that helicopters would take 15 minutes per hour related to helicopter landing and takeoff. For both pole and line installation, it was assumed that the helicopter would hover approximately 250 feet above the ground. Based on the above assumptions, following hourly Leq levels will be used:

- CH47D Hovering – 86 dBA Hourly Leq at 200 feet
- CH47D at Landing Zone – 80 dBA Hourly Leq at 200 feet
- H500D Hovering and at Landing Zone – 74 dBA Hourly Leq at 200 feet

As shown in **Table 1, Construction Noise Levels at Sensitive Receptor Locations**, hourly average helicopter noise levels associated with these construction activities at the closest sensitive receptor locations would range from 69 dBA to 82 dBA for helicopter activities at a lateral distance of 200 to 350 feet.

For the Energize Eastside Project, a mitigation measure to avoid some non-noise related impacts would involve the use of helicopters for pole installation and line stringing. At some locations, sensitive receptors could be as close as 15 feet laterally from the proposed alignment. Consequently, noise levels at immediately adjacent receptors to pole installation and line stringing would essentially be the same as the reference noise level at a height of 200 feet. Assuming that helicopter landing zones would have a 350-foot buffer from the nearest sensitive receptor, noise levels at such receptors would be the same as predicted in Table 1, below.

Most cities in the project area have a noise ordinance that limits the hours of construction activity but do not establish a quantitative noise standard. As an example, under the Bellevue City Code (BCC), noise emanating from construction sites is prohibited outside of the hours of 7 a.m. to 6 p.m. Monday through Friday, and 9 a.m. to 6 p.m. on Saturdays. No construction site noise is permitted on Sundays and legal holidays. If after-hours sounds from a construction site are clearly audible across a real property boundary or at least 75 feet from their source, it will be considered a noise disturbance (BCC 9.18.040.A.4) Additionally, sounds created by the repair or installation of essential utility services and streets are exempt from the restrictions of the noise ordinance (BCC 9.18.020.B.2) as are sounds originating from aircraft in flight (BCC 9.18.020.A.6).

Consequently, while helicopter noise would likely be clearly audible at the nearest receptors it would still be consistent with the restrictions of local noise ordinances and would be temporary in nature as construction activities would take less than three days to complete at any given location, with the exception of activities at the helicopter landing zones.

**TABLE 1  
CONSTRUCTION NOISE LEVELS AT SENSITIVE RECEPTOR LOCATIONS**

<b>Construction Noise Source</b>	<b>Distance to Closest Sensitive Receptor<sup>a</sup></b>	<b>Hourly Leq at Closest Sensitive Receptor</b>
CH47D – Pole Installation <sup>b</sup>	320 feet	82 dBA
H500D – Line Installation <sup>c</sup>	320 feet	70 dBA
CH47D at Landing Zone <sup>d</sup>	350 feet	75 dBA
H500D at Landing Zone <sup>d</sup>	350 feet	69 dBA

<sup>a</sup> Direct distances between a helicopter and a receptor based on the hovering height of 250 feet and horizontal distance to a receptor of 200 feet with the assumption of 6 dB noise propagation rate per doubling the distance.

<sup>b</sup> Helicopter Hourly Leq values near pole installation are calculated assuming the helicopter would hover above the site at an elevation of approximately 250 feet above the ground surface for an hour.

<sup>c</sup> Helicopter Hourly Leq values near TSP locations are calculated assuming the helicopter would hover above the site at an elevation of approximately 250 feet above the ground surface for up to 15 minutes per hour.

<sup>d</sup> Helicopter Hourly Leq values are calculated assuming the helicopter would operate in the immediate vicinity of the helicopter landing zone for up to 15 minutes per hour.

SOURCE: ESA, 2018