

Frequently Asked Questions

October 2012

Siting the Project

How did PSE develop their preferred final route?

Since September 2011, PSE has been working with an advisory group and consulting with the broader community to explore possible routes for the new Sammamish-Juanita 115 kilovolt (kV) transmission line.

The advisory group used a computer modeling tool that incorporated built and natural environment features to develop potential routes for discussion, and took into account community values and concerns to develop over 30 route alternatives. The group narrowed the field to three route alternatives, which PSE reviewed and modified to ensure they were feasible and constructible.

In June, PSE shared the three route alternatives with the community and hosted two community meetings. We discussed the project and route alternatives with more than 100 meeting attendees, and we received more than 400 comments.

On July 18, the advisory group met to develop its preferred route recommendation for PSE. The advisory group evaluated the route alternatives east of Interstate 405 (I-405) and west of I-405 separately. Advisory group members evaluated the three final route alternatives using six specific decision criteria, which included proximity to community land use areas and public support. The result, agreed upon by consensus, was a combination of two of the routes; Alternative 3 (east of I-405) and Alternative 1 (west of I-405).

We shared the advisory group's recommended preferred route with the community via the project webpage and at two community meetings on August 21 and 22, 2012. After taking into consideration the advisory group's recommended preferred route and the community's response, PSE adopted the advisory group's recommendation as our preferred final route. The preferred final route is shown in Figure 1.

Public Involvement

Why did PSE convene an advisory group to help site the transmission line? Who are the members?

PSE committed to working with the community to better understand local issues to consider in determining a route alignment that would meet the needs of PSE's customers, the local community and PSE. In an urban area with multiple jurisdictions, there's no easy answer to siting a transmission line. It was important that community and business leaders were involved in the process and an advisory group was one way to do so.

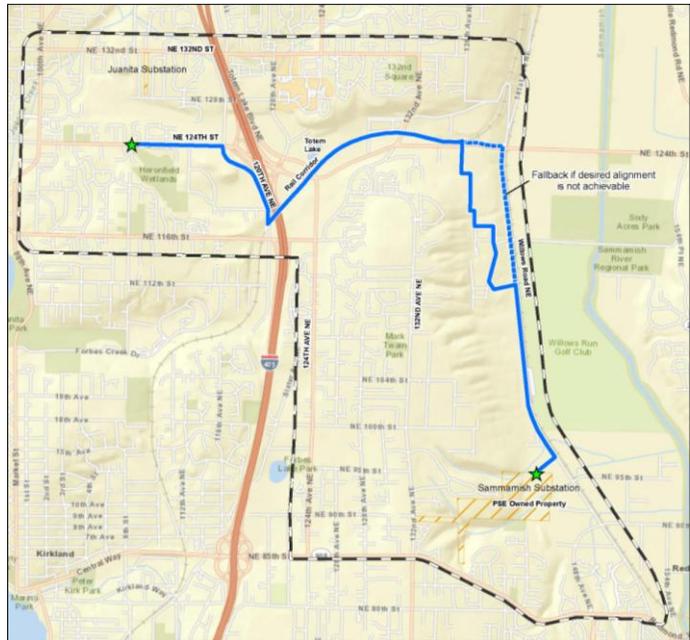


Figure 1. PSE's preferred final route. To review project maps, visit PSE.com/SammJuan115.

PSE collaborated with a diverse advisory group to develop route alternatives, select a preferred final route, and help us better understand community concerns.

PSE thanks all of the advisory group members and their respective organizations for participating:

- **Dirk Lakin**, Aerojet (Redmond)
- **Rob Jammerman**, City of Kirkland, Public Works
- **Linda Murphy**, City of Kirkland, Parks and Community Services
- **Jean Rice**, City of Redmond, Parks
- **Eric McConaghy**, City of Redmond, Planning
- **Lynda Haneman**, Evergreen Hill Neighborhood (Kirkland)
- **Lavon Weighall**, Evergreen Hospital (Kirkland)
- **Danielle Lynch**, Greater Redmond Chamber of Commerce
- **Ken Albinger**, Juanita Neighborhood (Kirkland)
 - **Mary Dunphy**, Alternate
 - **Richard Aijala**, Alternate
- **Forrest Miller**, Lake Washington School District
- **Don Schmitz**, North Rose Hill Neighborhood (Kirkland)
- **Fred Proctor**, Proctor International, Inc (Redmond)
- **Andy Swayne**, Puget Sound Energy
- **Kathe Low**, Sustainable Redmond
- **Tom Matthews**, Willows Rose Hill Neighborhood (Redmond)
 - **Gary Wightman**, Alternate
 - **Tim McGruder**, Alternate

Past members

- **Wilson Anhar**, Aegis Living (Kirkland)
- **Cindy Jayne**, Sustainable Redmond
- **Jill Krusinski**, Grass Lawn Neighborhood/Willows Rose Hill Neighborhood (Redmond)
- **Ron Parker**, Greater Kirkland Chamber of Commerce

What are the project next steps, and how can I get involved in the project?

Now that a preferred final route has been selected by PSE, the project has moved into the design and permitting process. As we move through the design and permitting process, PSE will begin working with individual property owners to purchase necessary easements and address property owner concerns and permitting concerns by making minor adjustments (also known as micro-siting).

There will be future opportunities for public input during the permitting phase of the project, as PSE applies for needed permits. We anticipate submitting permit applications in 2013 and beginning construction as early as 2014, depending on design and permitting schedules.

We encourage you to visit PSE.com/SammJuan115 to learn more about the project and welcome your comments and questions at info@sammjuan115.com.

Construction

When will construction begin and what are the anticipated impacts?

We are just beginning the design and permitting process, so it is too early for us to know the exact construction impacts. We are a few years away from construction, so as we get to that point (in 2014 or 2015) we will notify and keep impacted businesses and property owners informed of specific construction activities and the schedule of the work.

In general, construction will be confined to normal daytime working hours during the week, with the possibility of some work on Saturdays. When working in or along roads, we will have signs and flaggers helping direct traffic. In some cases, we may need lane closures during construction, so we would operate under an approved traffic control plan and use flaggers to minimize traffic impacts. We do not anticipate any scheduled power outages during construction; however, if an outage is needed customers will be notified in advance of the outage occurring.

Selecting the Route

Why does the preferred final route end south of the Juanita substation?

PSE and the advisory group looked for creative ways to route the new transmission line, including having different Juanita-area endpoints. The endpoints still meet the electric system needs, while allowing the advisory group to develop more route options for the community to consider.

The preferred final route will interconnect with an existing transmission line south of the Juanita substation in Kirkland. The existing line between the interconnection point and Juanita substation will be reconducted or rebuilt to the substation to match the capacity of the new transmission line.

Why doesn't the preferred final route stay on Willows Road?

During the siting process, PSE considered all community concerns. The preferred final route is located between commercial buildings west of Willows Road to avoid the City of Redmond's designated view corridor along Willows Road. It tries to avoid the view corridor by threading the needle around buildings, building restrictions, environmentally-sensitive areas and other restricted areas – all on private property that will require easements. While PSE believes this route is possible, we may not be able to meet all these restrictions or obtain necessary easement rights.

We know that siting the line along Willows Road would not have the same level of complication, so we are considering it the "fallback" route. The City's viewshed regulations do not prohibit transmission line construction; however, PSE is trying to be sensitive to the City's request to not construct a transmission line within the view corridor.

Why doesn't PSE bury the transmission line?

While transmission lines can be undergrounded, PSE historically constructs these neighborhood transmission lines above ground. Underground transmission lines present several hurdles, including enough space in the public right of way for the trench and vaults needed to place the line underground, ability to address the increased environmental impacts, and substantial cost sharing from the local jurisdiction/customers to pay for the increased cost of putting the line underground. For a 115 kV line, it could cost \$4 million to \$10 million per mile to bury the line versus \$500,000 to \$1 million to construct an aboveground line.

Burying a transmission line also takes more construction time than an aboveground line due to the time it takes to clear vegetation, dig trenches, relocate existing utilities, and install large vaults for the length of the project. Depending on the difficulty of trenching, burying the line could add four to seven months to the construction phase.

For more information, review PSE's underground transmission line fact sheet at PSE.com/inyourcommunity/PSEConstructionProjects/Documents/UndergroundingFactSheet.pdf.

Design

How much will the project cost?

Using the preferred final route, we now estimate the total construction and materials costs will range from \$6 million to \$8 million. The overall project costs will be dependent on many factors including micro-siting, site specific design conditions, permitting, restoration needs and easement costs. We will have a better idea of total project costs once we finalize micro-siting and project design.

What will the poles look like?

The type of pole to be used for the project has not been determined. Generally, a 115 kV transmission pole averages 65 feet to 75 feet in height depending on topography and distance between poles, which typically ranges from 350 feet to 400 feet.

PSE anticipates using some combination of wood or steel poles. Steel lattice towers will not be used for this project. Figure 2 shows an example 115 kV pole design. To view other examples poles, visit PSE.com/SammJuan115.



Figure 2. Example 115 kV pole design

What are the setback requirements for residential property?

State law requires us to design our transmission and distribution lines to meet or exceed requirements of the National Electric Safety Code, which provides minimum horizontal clearance distances from buildings. These distances vary based on the voltage of the wires rather than the support structures (poles, cross arms, guy wires, etc.). We have to design our 115 kV transmission lines and locate the structures that support them so that when they are still, our wires are at least 9.1 feet from buildings and when they move in the wind, they stay at least 6.1 feet from buildings.

We typically design our lines and locate our poles in excess of these minimum requirements to allow for changes in our facilities over time.

How will PSE acquire right of way easements? How does the County Assessor take into account the new transmission line and value of the property?

PSE prefers to site projects along public rights of way or existing utility corridors wherever possible. PSE may need to acquire property or access to and use of private property via easements. When use of private property is required, PSE negotiates the purchase of easements with each property owner based on an appraisal of the fair market value of their property and any impacts the easement and facilities will have on the property.

Regardless of where a line might be located, the County Assessor assigns a value to the property. The Assessor would likely follow the same appraisal practices as any licensed appraiser and look at comparable sales with common characteristics such as zoning, lot size, condition of the improvements and neighborhood conditions. The Assessor may take easement payment into account in addition to the typical criteria used to determine value.

How tall can trees grow under 115 kV transmission lines?

Mature tree and vegetation height limits under 115 kV transmission lines generally range from 15 feet to 25 feet depending on the types of poles used. PSE is committed to working with landowners to provide assistance with long-term vegetation management.

Other

Will the new transmission line cause radio and television interference?

In general, modern overhead 115 kV transmission lines do not interfere with normal radio or TV reception. If interference is identified with a 115 kV transmission line, then the source of interference can be located and repaired.

Can the electromagnetic fields from the new transmission line affect my health?

All of us depend on electricity to meet basic needs such as heating, cooling and lighting of our homes. Wherever we use electricity, power frequency electric and/or magnetic fields (EMF) are present.

Over the past 30 years, there have been many scientific studies conducted to determine if power frequency EMF has any effect on human health. PSE stays up to date on this large body of research and relies on the findings of reputable international and national scientific and public health organizations that have reviewed the research on EMF. To date, no studies have established a cause-and-effect relationship between EMF and any adverse health effects in humans or animals. As a result of these findings, neither the U.S. government nor the state of Washington has established standards for public exposure to power frequency EMF.

At PSE, safety is always our top priority and we are committed to keeping our customers informed. To schedule an appointment to measure EMF in your home or to talk with an EMF expert, please contact PSE's Environmental Services Department at 425-456-2522. For more details about EMF studies, exposure limits and PSE's approach to EMF, visit PSE.com/safety/ElectricSafety/Pages/Electromagnetic-Fields.aspx.

Will the new transmission line make a lot of noise?

In general, 115 kV transmission lines do not produce noise like some higher voltage lines may. Over the years, transmission line construction improvements have helped minimize the likelihood of audible noises.

Project Need

Why is this project important to Redmond-Kirkland residents and businesses?

Demand for power is growing. The northern Redmond-Kirkland area electric system – called the Moorlands electric system – serves a population of nearly 150,000 residential, commercial and industrial customers. The Moorlands system faces two challenges – capacity (the ability to supply enough power) and reliability (ensuring we can provide power during times of peak usage or when parts of the system are out of service).

The Moorlands system transmission lines currently serve 12 local substations and the system is approaching its capacity limits. This means under certain conditions these transmission lines can overload, potentially resulting in outages to all 150,000 customers in the area.

To increase capacity and improve service reliability to customers, the new Sammamish-Juanita 115 KV transmission line is proposed to be installed. The Moorlands system will be reconfigured to transfer the electric load of two existing substations to another transmission system that has more capacity; thereby freeing up capacity on the Moorlands system. The new line will improve system reliability by adding an additional transmission pathway to the Moorlands system.

What is the probability of an outage occurring with the current electric system configuration and the two other upgrades?

The existing Moorlands electric system is served by three 115 kV transmission lines – the Cottage Brook-Moorlands line, Moorlands-Vitulli-Sammamish line and the Sammamish-Moorlands line (shown in Figure 3).

The probability of losing two lines simultaneously, which would then overload the third line, is very low. However unlikely this type of outage, industry standards require PSE to study and mitigate for this potential outage situation. While substation equipment helps to prevent overloading the third line, the number of days each year where there is risk of overload has increased from just a few days several years ago to over 150 days per year now. The Cottage Brook-Moorlands line rebuild will prevent that overload for several years.

The probability of one transmission line being down for maintenance or road construction and a second unplanned outage (like a car hitting a power pole) affecting a second line occurring is much higher than a simultaneous loss of two lines. Over the past 10 years, PSE has experienced 50 unplanned outages among the three Moorlands transmission lines, which equates to five outages per year among the three lines. One of the unplanned outages in late 2010 occurred during a planned outage on the same transmission line, and 9,700 customers lost power.

With five or more outages per year, there is a moderate chance that a “double-contingency” outage could occur on a day that requires PSE to drop load to avoid line overloads, which means having a forced power outage for thousands of customers.

We are working to rebuild the Cottage-Brook to Moorlands transmission line and the Moorlands-Vitulli lines to increase their capacity, which will help reduce the probability of outages; however, even after completion of these rebuild projects, there is still the possibility of a double-contingency overload. Given these constraints, PSE’s Transmission Planning guidelines recommend adding a fourth line to the system to increase system capacity and reliability, which is the Sammamish-Juanita 115 kV Project.

Why can’t PSE solve the problem by increasing the system’s existing 115 kV lines to 230 kV lines?

PSE and other utilities use 115 kV lines in communities to move power between distribution substations, while 230 kV and higher voltage transmission lines are used to move bulk power between transmission substations. You can compare these to roads – distribution lines act as your neighborhood streets, 115 kV transmission lines are major arterials, and 230 kV transmission lines are highways.

To rebuild existing 115 kV lines in the Moorlands area to 230 kV, several factors must be addressed.

1. The lines would have to connect to Sammamish substation (a transmission substation).
2. At least 35 miles of 115 kV transmission lines would have to be rebuilt to 230 kV to provide redundancy for area substations. Estimated line rebuild costs range from \$70 million to \$140 million.
3. To meet the 230 kV operating standards, existing transmission line poles and insulators would have to be replaced and existing easements would have to be widened. There are construction impacts related to pole replacement, and PSE would have to purchase additional easements on numerous privately owned properties.
4. Fourteen existing substations would have to be rebuilt to accommodate the new 230 kV lines, including installation of new 230 kV transformers. The new equipment takes more space, so PSE may

have to increase the physical size of the substations. Estimated substation rebuild costs range from \$20 million to \$50 million.

Building the new 4.5 mile Sammamish-Juanita transmission line at 115 kV will impact and cost customers many times less than rebuilding 35 miles of transmission line and 14 substations to 230 kV.

If the power lines north of the Juanita substation were broken by a tree falling today, how big of an area would be affected? How long would it take to restore power?

If a tree or car-pole accident caused an unplanned outage between Moorlands and Juanita substations, there would be a brief outage to the 6,500 customers served by a substation north of Juanita substation. The circuit breakers at the Juanita and Moorlands substations would prevent the outage from affecting other customers. Automatic switching or dispatchers at the operation center would activate switches at the affected substation and restore power to the substation. The outage would range from less than 1 minute to at most 20 minutes.

If the same outage happened while the Sammamish end of the Sammamish-Moorlands line is down for planned maintenance or city road work, then 21,000 customers would be without power. Power would be restored only after the planned or unplanned outage was completed, which could take several hours.

The Project Area

Why isn't the area south of Northeast 116th Street and west of I-405 included in the project study area?

One of the main purposes of constructing the new Sammamish-Juanita transmission line is to transfer the electric load of two substations to another system that has more capacity – decreasing the capacity constraints on the existing Moorlands system. Those two substations are Crestwood (located on the south side of Forbes Creek Drive just west of 108th Ave. NE in Kirkland) and Norkirk (632 7th Ave. in Kirkland). To accomplish this system reconfiguration, the new Sammamish-Juanita transmission line needs to connect somewhere north of Crestwood substation and south of the Juanita substation.

Additionally, while we recognized there may be routing options south of Northeast 116th Street and west of I-405, these options provided a less direct route between the transmission line's two connection points and were inhibited by existing electric infrastructure and land uses along existing road rights of way. When identifying the project study area, we tried to create a study area that offered many routing options for consideration while ensuring the routing options were as direct and practical as possible.

Lastly, PSE will need to construct the Juanita-Moorlands transmission line in the future. The future line can start anywhere south of the proposed Sammamish-Juanita end point on Northeast 124th Street and will end at our Moorlands substation (8010 NE 185th St. in Kenmore). If we were to route the Sammamish-Juanita line south of the end point along Northeast 124th Street, it would limit the options we have for routing of the future Juanita-Moorlands line.

For More Information

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- Contact: Barry Lombard, Project Manager, at (425) 456-2230