

# Chelan and Leavenworth Substation Update

May 15<sup>th</sup>, 2017

# Discussion

- Overview of underground transmission construction
- Review of the financial comparison between overhead and underground transmission
- Transmission line options to site 18 (Lookout) – generally applicable to any option south of the Chelan-Manson transmission line
- Conclusions – seeking to further identify a substation location for the North Shore of Lake Chelan
- Update on Leavenworth preferred alternative substation site

# Construction Methods - Underground

## Conduit and Trenches

- Required for entire length
- Backfill for thermal characteristics

## Vaults

- Required at least every 2,500 ft (limitations in the length of cable run)
- 8ft x 20ft x 10ft (or larger)
- For cable splicing and anchoring on hilly/mountainous terrain

## Known unknowns that could significantly increase costs estimates:

- Property acquisition
- Right-of-way impacts
- Sloped terrain
- Surface restoration
- Digging / rock mitigation

Figure 18-13 Conduit Placement



Figure 18-14 Conduit Backfilling



Figure 18-15 Vault Placement



Figure 18-16 Vault Placement - Top



# Transmission Construction Comparison

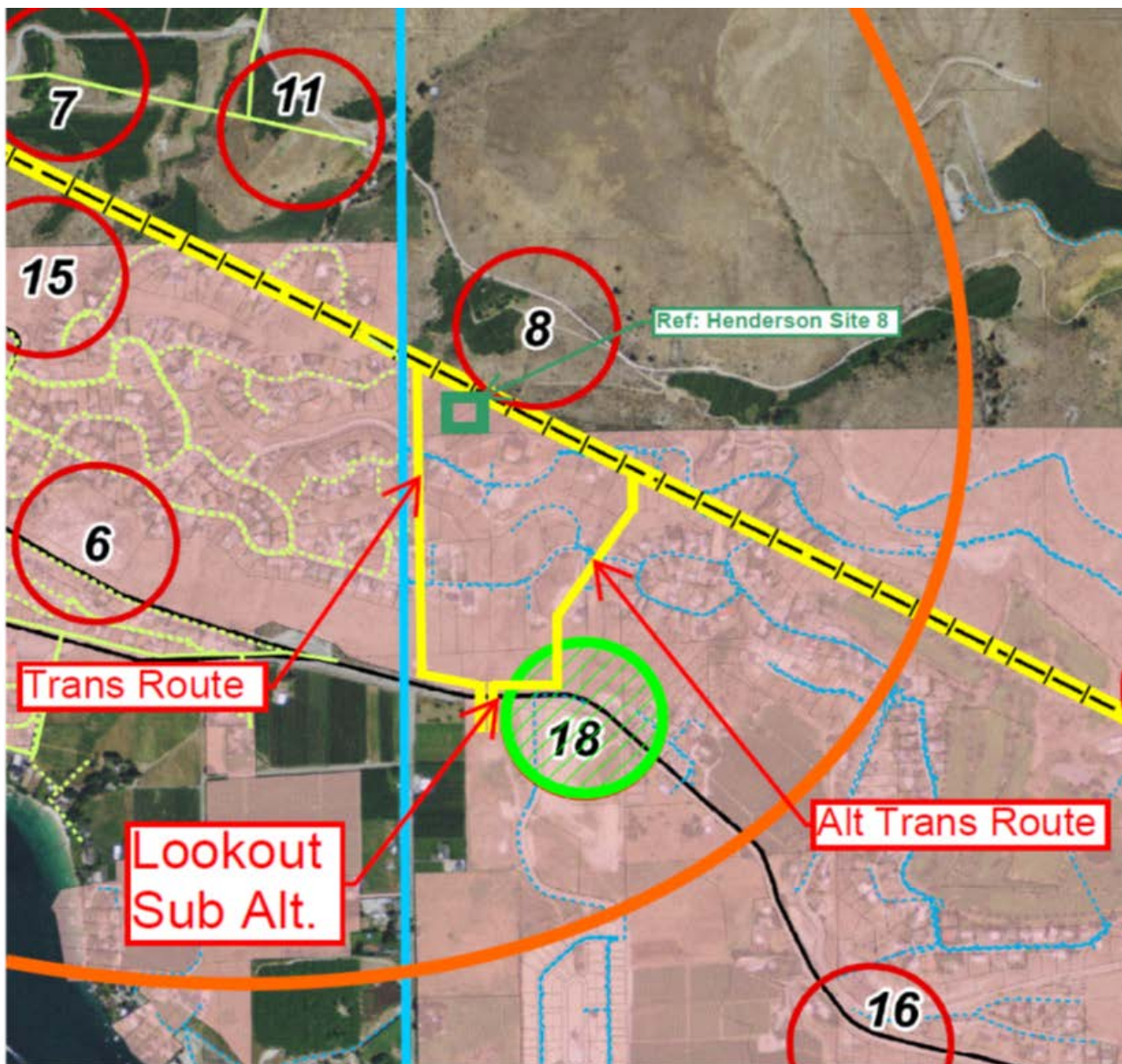
	Overhead double circuit, varied terrain	Underground double circuit, varied terrain
Estimated NPV cost per mile, installation plus maintenance	\$1.028M – \$2.029M	\$7.122M - \$13.429M
Estimated life	80+ years	80+years (with a re-conductor at year 40)

## Not included in comparisons:

- Environmental studies
- Local, state, federal permits
- Easements and property acquisitions
- Right-of-way impacts
- Surface restoration
- Sloped terrain
- Digging conditions / rock mitigation
- Other

***Sloped terrain  
could at least  
double the  
installation  
costs***





Known issues to address for a specific Lookout / site 18 underground transmission route:

- Property acquisition involving at least 12-19 parties
- Right-of-way disruption and road restoration will be required
- Elevation drop of 380' with slopes near 70% from transmission origin to substation site
- 2,150' to 2,300' overall route length
- Rock/granite digging environment is expected
- Other

For an overhead option we would have the following impacts:

- Property acquisition involving at least 12-19 parties
- 220 view impacts



CHELAN COUNTY  
**POWER**







# Conclusion

- Underground Transmission is cost prohibitive in the Lake Chelan North Shore substation siting effort south of the Chelan-Manson line
- Property impacts would be disruptive during construction with both options
- Slope and potential routes would be technically challenging to accomplish
- Grade and radius will create the need for multiple splicing vaults if underground
- Overhead transmission would have the highest view impacts

Staff recommends further targeting our efforts on a substation site north of the Chelan-Manson transmission line and close to the load center

# Leavenworth Substation Update

- 5/1 - approved moving ahead purchasing property located at 10381 Chumstick Highway as another substation site alternative
- 5/11 – met with the community focus group and updated them on the new site and reviewed against the other 2 alternatives
- After the review, the community group endorsed moving ahead with the Chumstick site as the preferred alternative
- Staff will continue to further develop the feasibility analysis for all 3 sites
- Late June feasibility drafts will be presented and staff will reconvene the community focus group and plan for a community update
- On path to make a recommendation to the Board of Commissioners on July 10th