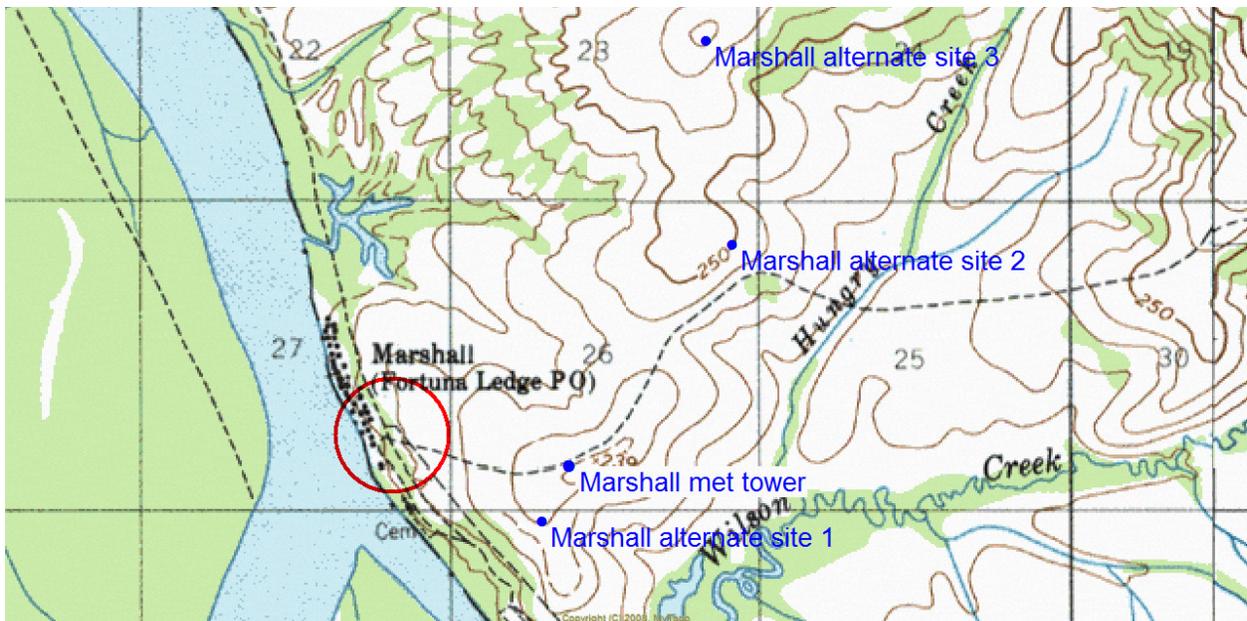
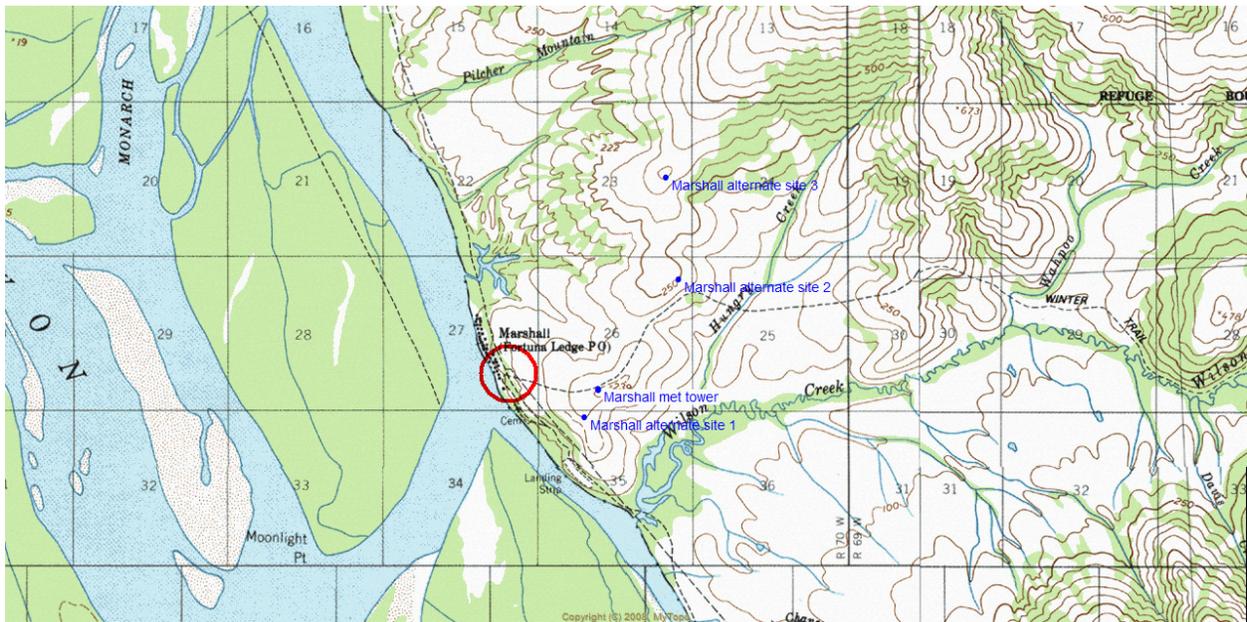


Marshall WAsP Site Options Analysis

July 23, 2012

Using ten months of wind data collected from the Marshall met tower (Site 0050), WAsP software was used to model the wind regime of Marshall and to predict mean wind speed and turbine performance at the met tower site and three possible alternative wind power sites, shown in the maps below.

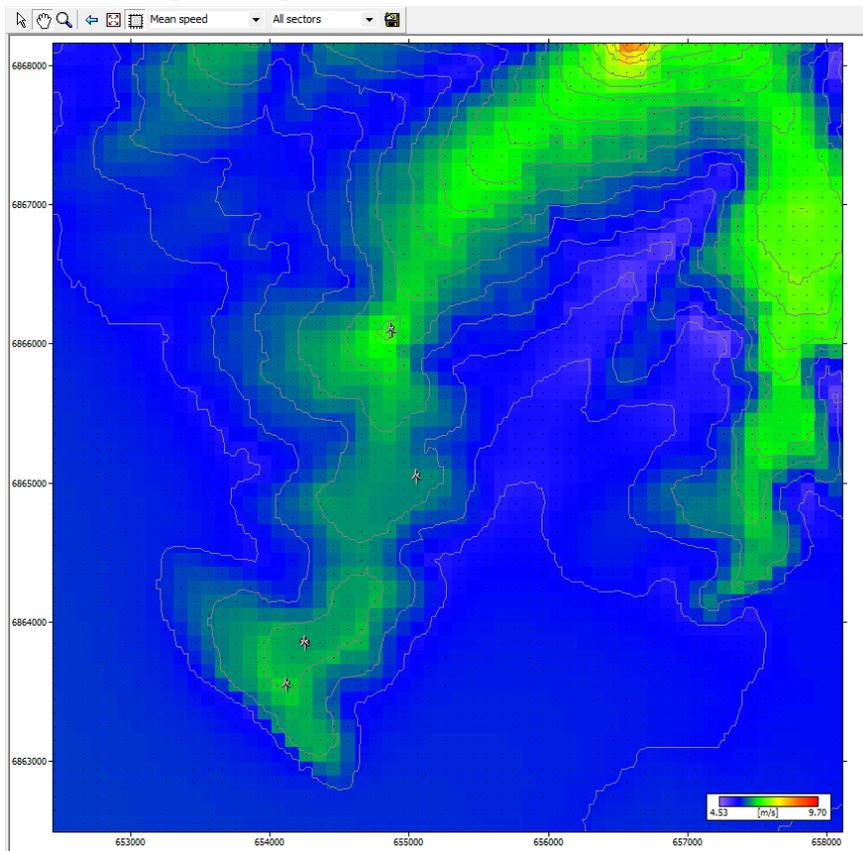
Topographic maps



Google Earth map



WASP wind speed map



Predicted site wind speed and turbine performance

Wind speed and turbine annual energy production (AEP) are calculated by the WASP software. Turbine AEP is based on the NW100B turbine at a 30 meter hub height, the height of the met tower upper level anemometers. Turbine hub height is 37 meters, hence actual turbine AEP would be better than indicated below, but setting turbine hub height at anemometer height simplifies the analysis and the purpose here is comparative, not actual. Once a site is chosen and the CDR written, turbine type and actual hub height will be adjusted to obtain true predicted performance.

Site comparison table

| | Mean wind speed m/s | Mean power density W/m ² | AEP MWh/yr | AEP compared to met tower site % |
|------------------|------------------------------|--|---------------|--|
| Met tower site | 6.19 | 336 | 239.5 | 100% |
| Alternate Site 1 | 6.44 | 388 | 255.7 | 107% |
| Alternate Site 2 | 6.09 | 330 | 231.9 | 97% |
| Alternate Site 3 | 6.72 | 441 | 274.2 | 114% |

Recommendation

The wind site options in Marshall, in a general sense, are good considering Marshall's distance upriver from the coast. The met tower site is roughly comparable to alternate site 2, but nearby alternate site 1, just 315 meters straight downhill from the met tower site toward the Yukon River, is predicted at 7 percent higher energy production. Alternate site 3, located on a rise on the road leading to the UUI tower on Pilcher Mountain, is the best of the four sites with predicted 14 percent higher turbine energy production than at the met tower site.

It is recommended that all four possible wind sites be investigated for landownership and access issues. Distribution line construction costs should be compared to turbine performance over time to determine highest net present value; this will help determine the preferred turbine site for development.