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## Geographic Information System Services

### Introduction

Since 1992 Utility System Efficiencies, Inc. (USE) has served a variety of power industry clients, enhancing their transmission and system analytical capabilities. In 2007, USE implemented its Geographic Information System (GIS) Department to actively assist clients with generation interconnection projects. Since 2007, USE GIS Services has assisted renewable and conventional generation developers identify the most economically, electrically, and environmentally feasible locations to interconnect to the grid. USE uses a GIS database that contains a detailed representation of the electrical transmission network. This data is further enhanced by using regional power flow data to create maps that illustrate how the transmission network relates to the earth's landscape, infrastructure, and human population.

Using GIS tools, USE offers the ability to compile environmental resource data and combine it with map overlays of the electrical transmission grid. Such maps are among the key documents used in identifying opportunities and environmental constraints for establishing feasible transmission line routes for the interconnection of new generation. This analysis aids clients and reduces project costs by identifying environmentally-sensitive areas that should be considered for avoidance or mitigation, and by focusing field surveys on only the most likely project areas.

USE applies an iterative approach in its project management, working closely with the client through frequent and effective communication.

### USE GIS Team

**Michael Wood** – Formally educated and trained in GIS. Michael has worked in GIS related jobs since graduating with a Masters of Science degree from the University of Redlands in the fall of 2003. He developed, manages, and maintains a GIS database that represents the transmission network and shares a dynamic link with power flow output data. Mr. Wood has worked to identify relationships and patterns between the transmission network and local landscape, infrastructure, ecosystems, and human populations through GIS analysis and illustrates these findings through figures and graphics.

**Megan Wood** – Environmental GIS Specialist with a strong background in managing utility permitting projects. Megan has experience in siting, permitting and planning linear projects. Megan has assembled and managed GIS staff, services, hardware and software needed in the design, construction, and administration of both environmental project-based and core geospatial data systems. Megan has provided GIS and database support to



project managers and other scientists involving spatial and 3D analysis, geodata processing, data interpretation and conversion, scripting, and figure generation.

**Gregory Wood** – Fully trained and licensed UAV (or drone) pilot aiding in the identification of distribution and transmission facilities. Gregory’s thermography capabilities offer additional lines of services to the USE team, including but not limited to transmission line vegetation management and troubleshooting malfunctioning or non-optimal operating utility system equipment.

### **USE Environmental Screening Services**

GIS is a tool used by USE that enables our engineers to provide a comprehensive report that delivers the best possible analysis to clients. GIS analysis provides clients with a greater understanding of their interconnection options for a project.

USE identifies relevant data from the following list of publicly available information and collects in a GIS database when performing a transmission routing study. USE leverages these datasets to assess existing conditions within the area of interest:

- The most recent National Aerial Imagery Program (NAIP) aerial photography,
- U.S. Geological Survey (USGS) topographic maps,
- Soils data from the Natural Resources Conservation Service (NRCS) (to identify soils sensitive to erosion and compaction),
- NRCS farmlands data (to identify farmlands that are prime, unique, or of state-wide importance),
- Land use data from NRCS,
- National Hydrography Dataset (NHD) (to assess waters of the U.S.),
- National Wetlands Inventory (NWI) maps, NRCS hydric soils data, and NHD data (to assess wetland locations),
- Federal Emergency Management Agency (FEMA) floodplain maps,
- Federal and state plant and wildlife agencies' lists, descriptions, and occurrences of rare, threatened, and endangered plants and animals and their habitats,
- Conservation areas and special management areas, and
- Optional: Cultural resources Class 1 file search (to identify previous surveys in the area of interest and any cultural resources identified).

USE also offers unique GIS datasets/mapping techniques such as:

- Existing transmission network,
- Proposed major projects,
- WECC Transfer Paths,
- Generation interconnection queues, and
- Electrical system information such as voltages and transmission line loadings.

USE will summarize the results and findings of our project work with:

- A series of opportunities and constraints figures illustrating the project region as well as the most environmental and electrically feasible interconnection routes, and
- Datasets and a letter report describing the data used, potential constraints to project development within the area(s) of interest, and consequences of project development in any identified sensitive areas.



Cost estimates provided for the work described above include the following assumptions:

- No field work is required, and
- No original data will be collected.

If you wish to utilize USE's Geographic Information Services or wish to learn more about other GIS services that are offered, please contact Michael Wood, Geographic Information System Specialist at (303) 249-2981 or email [michaelwood@useconsulting.com](mailto:michaelwood@useconsulting.com) to discuss your needs.