POWER FREQUENCY ELECTRIC AND MAGNETIC FIELDS (EMF)

Electric and magnetic fields are a basic force of nature (like gravity) generated by electricity. They are found almost everywhere and are created by such things as lightning and static electricity. Manmade fields are found wherever people use electricity, such as near power lines and electric appliances.

"*Power frequency*" fields are generated by power lines, building wiring, and appliances. The lower the *frequency* of a field, the lower is its energy. Microwave and x-ray fields are high frequency fields and have high energy levels. Power frequency fields are low frequency fields and have low energy levels.

We are exposed to a multitude of power frequency sources each day. Household appliances generate an *electric* field as soon as they are plugged into an electrical outlet, i.e., most of the time. They generate a *magnetic* field when the appliance is turned on. The strength of both electric and magnetic fields decreases as you move away from their source, just as the warmth from a campfire decreases with distance. The EMF generated by common items such as can openers, electric clocks, and computer monitors varies greatly depending on the brand and the type of appliance. Some studies indicate we get relatively high exposure from electric blankets and hair driers since they are used close to our bodies.

The electric and magnetic fields generated by power lines are generally higher near the wires and decrease as you move away. We may be exposed to EMF from high voltage *transmission lines* (usually on metal structures or poles, carrying electricity from generating plants to communities) and *distribution lines* (usually on wooden poles, bringing electricity to our homes, schools and workplaces).

Some epidemiologic studies have suggested associations between proximity to power lines and childhood cancer. However, while epidemiologic studies help suggest factors that may contribute to a disease risk, experimental studies under controlled conditions are generally required to establish cause-and-effect relationships. Several major agencies have studied power frequency electric and magnetic fields and have not found that the fields around us cause cancer in humans. No federal or Texas regulations restrict power frequency fields.

Tree Clearing by CPS Energy as It Relates to Federal and Local Law

The Endangered Species Act (ESA) of 1973 was designed to protect wildlife species in the United States by among other things, associating protection of a designated endangered species with protection of its habitat. As a result of the law, certain areas frequented by protected species are subject to particular, and sometimes extensive, restrictions in the use of the land in question. These restrictions can affect making it extremely difficult to perform ordinary activities such as land clearing and general construction in those areas known to contain endangered species. These activities can be performed only after it can be shown that the activities will not harm any listed or proposed endangered species.

In Bexar County, two species of birds (Black-Capped Vireo ("BCV") and Golden-Cheeked Warbler ("GCW")) and karst invertebrates have been listed as endangered. These species live in the northern part of Bexar County, generally in the "Hill Country" or "Edwards Aquifer" region.

Both birds are found Northwest of San Antonio outside Loop 1604 between I -35 and Highway 90. These particular bird species only live in Bexar County between late March and early September when they have completed their migration from Mexico and Central America to nest and raise their young. Construction activity in the breeding season is not allowed without a permit or approval from U.S. Fish & Wildlife Service.

The BCV prefers to nest in brushy areas from three to six feet off the ground in vegetation such as sumac, persimmon, mountain laurel and small oak trees, whereas the GCW will nest in areas having cedar and larger oaks and other mature hardwoods.

In addition, CPS Energy will promote and maximize the preservation of trees in all capital improvement projects conducted within the City of San Antonio (COSA) and its Extra-Territorial Jurisdiction (ETJ) according to Chapter 35 of the City Code of San Antonio, and Chapter 35, Article V, Section 35-523 as amended on May 6, 2010; in addition, comply with adopted ordinance #2008-08-20-0652 requiring a Habitat Compliance Form (HCF) in conjunction with tree permits

As development continues to expand in the northern Bexar County area, the potential to disturb BCV, GCW, and other protected species habitat by related CPS Energy construction activities increases. Any disturbance or destruction of this habitat without first obtaining the necessary permits or approval from the U.S. Fish & Wildlife Service would be a violation of federal law and would subject CPS Energy to possible civil and/or criminal penalties.

As a public organization and environmental steward for the San Antonio area CPS Energy will not knowingly violate any federal, state or local laws in the development, construction or operation of CPS Energy facilities. If you think CPS Energy is in violation of an environmental or regulatory law please contact us immediately.

Substation Selection Criteria

When selecting a substation site, CPS Energy follows guidelines established in the Facility General Routing/Siting Process for Electric Transmission Lines and Substations that was approved by the Board of Trustees in December 1999. The document lists the criteria utilized for selecting a substation site which consists of engineering, aesthetics, and environmental criteria. Some of the factors have a greater importance than others such as selection of a site within the general area where the need has been established based upon load and system requirements. Environmental factors will also carry a heavy weight since disturbance or destruction of protected species habitat would be a violation of federal law, and obtaining the necessary permits or approval from the U.S. Fish and Wildlife Service may cause project delays.

One criteria states, “where possible, locations near existing or proposed interstate or state primary highways will be avoided, except in commercial/industrial areas.” While the former criterion is a consideration, we must balance that criteria with other considerations such as accessibility to the site, following previous development and finally locating in commercial/industrial areas. A substation site requires public roadway access of sufficient quality to allow for normal operation and maintenance vehicle access during bad weather conditions and to allow for large construction vehicles during good weather conditions. Being able to gain access quickly during adverse weather conditions means that service can be restored faster in case of an outage. When possible we try to locate new infrastructure in previously developed areas in an effort to minimize the impact to green field or undisturbed sites. Finally, the recommended site is located in an area of commercial development in line with a fire station, steel fabrication plant, a commercial retail property and the recommended site itself which is currently leased as a recreational vehicle sales lot.

The process for selecting a substation site is documented in the Environmental Assessment (EA) report created for the specific substation selected. The EA lists the criteria and the importance it was given for the particular site. Each site is unique because of various factors including terrain, soil, and vegetation. There are some sites where engineering may be more important than environmental, but it could be the other way around for another site. Environmental factors are more important when a substation is needed is an environmentally sensitive area (such as the Ranchtown Substation) where known endangered species and solution features important for Edward’s Aquifer recharge may be encountered. In this case, selection of a site can be limited by these constraints, and finding an adequate location for a new substation can be difficult.

Site Selections Related to San Antonio Ranch Subdivision

An undeveloped portion of San Antonio Ranch subdivision was included in the study area for the Ranchtown Substation Project (the study area map can be referenced on the CPS Energy website). During the potential site development portion of the project, the CPS Energy Project Team evaluated all potential sites located within the study area. The evaluation process includes review of aerial maps, driving and evaluating from publicly accessible right of way, evaluating input from public agencies and officials, and review of other miscellaneous information included but not limited to conversations with local property owners or other interested parties.

During this portion of the project, CPS Energy was made aware Texas Fish and Wildlife and the City of San Antonio were in joint negotiations to purchase a portion of the San Antonio Ranch property included in the study area. Upon further investigation, CPS Energy was made aware Texas Fish and Wildlife would not issue a permit to construct a new substation within the San Antonio Ranch property. Based on this information the CPS Energy Team discontinued analyzing potential substation sites within the San Antonio Ranch area.

After finalizing the 11 potential sites and during the final selection process, the CPS Energy project team was requested to add a potential site in San Antonio Ranch. After considering the area again, it was decided an additional site would not be added for consideration. The following are some of the major reasons why.

- Several potential sites were already located much closer to the target area. (The Target area is the intersection of the Helotes-Menger Transmission Line and Bandera Rd)
- Any site would be located in the Edwards Aquifer Re-Charge Zone creating potential schedule impacts and making permitting and construction more expensive.
- Endangered species habitat removal would be required to build a substation and build distribution exits to Bandera Rd. (We were now aware of the minimum 3 year delay due to permitting but only if Fish and Wildlife would issue a permit)
- Extreme high cost for distribution exits from the substation to Bandera Rd. (Both the cost for easements and the cost to build down Ranch Parkway to Bandera Rd)