High Voltage Power Lines – Summary of the Facts

General Health

The scientific literature conclusively links the following negative health outcomes with overhead high voltage power line electromagnetic field (EMF) exposure over an extended period of time:

- Variety of childhood and adult cancers
- Childhood and adult leukemia
- Alzheimer’s disease
- Lou Gehrig’s disease
- Suicide
- Depression
- Stress
- Specific types of heart disease
- Tumor growths
- Skin growths
- Abnormal cell activity
- Impairment of perception and memory
- Genetic defects
- Gland production deficiencies
- Mental and behavioral problems
- Immune system deficiencies
- Nervous system disorders
- Birth defects
- Miscarriages
- Stunting of growth
- Blood and circulatory problems
- Fatigue
- Headache
- Nausea
- Decrease in visual and motor reaction time
- Male sexual dysfunction
- Sleep deprivation
- Electromagnetic hypersensitivity
- Aggravation of asthma, tinnitus, multiple sclerosis, diabetes, and Attention Deficit Disorder symptoms

Leukemia

- Many scientific and medical studies show that higher risks of childhood leukemia are found among children living near overhead high voltage power lines.

- Risks vary from 2 to 5 times the expected rate for the general population.

- The incidence of leukemia in Ontario utility workers exposed to above-normal EMFs is 4.3 to 5.5 times the expected, with risk increasing as the exposure increases.
Cancers

People who live, work or attend school near overhead high voltage power lines have the following increased risks of contracting cancers:

- Nervous or gland system cancer: up to almost 12.0 times the expected risk
- Brain cancer: up to 10.3 times the expected risk
- Male breast cancer: up to 6.0 times the expected risk
- Connective tissue cancer: up to 3.3 times the expected risk
- Female breast cancer: up to 3.2 times the expected risk
- Intestinal cancer: up to 3.0 times the expected risk
- Lymph cancer: up to 2.2 times the expected risk

Alzheimer’s Disease & Dementia

- Many studies have shown a link between people exposed to above-normal EMFs and Alzheimer’s disease and dementia.
- The risk of Alzheimer’s disease increases to 4.9 times the expected rate in the general population.
- The risk of dementia increases to 2.5 times the expected rate in the general population.

Birth Problems

Women who live or work near overhead high voltage power lines have the following increased birth risks:

- Miscarriage: up to 5.7 times the expected risk
- Throat birth defects: up to 2.5 times the expected risk
- “Water on the brain” birth defect: up to 1.7 times the expected risk
- Heart birth defects: up to 1.5 times the expected risk

Suicide and Depression

- For over 30 years, studies have correlated above-normal EMF exposure with increased risks of suicide and depression.
- Suicide mortality among electrical utility workers is up to 3.6 times the expected rate, with workers less than 50 years of age experiencing the highest risk.
- The risk of severe depression increases by 4.7 times the expected rate for people living near overhead high voltage power lines.
International Commission for Electromagnetic Safety

- The ICEMS, an association of renowned scientists, medical doctors and engineers involved in EMF and health research, encourages governments to follow the Precautionary Principle when establishing guidelines for human EMF exposure.

- The Precautionary Principle states when there are indications of possible adverse effects, though they remain uncertain, the risks from doing nothing may be far greater than the risks of taking action to control these exposures. The burden of proof is shifted from those suspecting a risk to those who discount it.

- “Epidemiological (population health and illness) and laboratory studies that show increased risks for cancers and other diseases from occupational exposures to EMF cannot be ignored.” (quote from 2006 Benevento Resolution).

Health Canada

- Canadian electricity transmission companies indicate that Health Canada has concluded that EMFs from overhead high voltage power lines pose no health risk.

- Health Canada has been criticized by many health scientists as being “offside” and “out of touch” when compared to warnings issued by other agencies, governments and scientific organizations about the negative impacts of various products, pollutants and EMFs.

- For example, Health Canada has been very slow to warn Canadians about the dangers of smoking, excessive cell phone use, and exposure to asbestos and lead jewelry.

Property Values

- The value of residential properties less than 100 meters from overhead high voltage power lines is up to 38% lower than properties beyond sight of such lines.

- The effect of property devaluation has been seen up to 2.5 kilometers from overhead high voltage power lines.

- The per acre values of agricultural property sales are 16% to 29% lower for properties with overhead high voltage power line easements than for similar properties without easements.
**Birds**

- The U.S. Fish and Wildlife Service estimates about 175,000,000 bird deaths annually in the U.S. from collisions with overhead power lines, which is greater than the number of bird deaths from hunting.

- Studies have shown 124 bird collision deaths per kilometer of overhead power line per year.

- Overhead power line electromagnetic fields significantly increase eggshell thinning and reduce egg size, egg laying and hatching success in birds.

**Livestock and Pets**

- Exposure to high voltage power line EMFs results in decreases of 5.0% in milk yield, 13.8% in fat corrected milk yield and 16.4% in milk fat among Holstein cows.

- High voltage power lines cause breathing problems and weakened immune systems in cows and pigs; abnormally low pig birth rates and high piglet mortality; and undersize heifers, some afflicted with hemorrhages or abortions.

- Dogs and cats exposed to above-normal EMF levels have stillborn and deformed puppies and kittens, have abnormal “unbreedable” seasons, and show risks of lymph cancer 6.8 times the expected rate.

**Aesthetics**

- Overhead high voltage power lines are unsightly. Thick cables hung between 200-foot tall grey metal towers are a blight on the landscape.

- Because proposed 500 kilovolt towers are so tall (20 stories), they will be an eyesore for greater distances and to more people than transmission towers typically seen in Alberta.

- Above-ground high voltage power lines emit loud, harsh and raspy humming or buzzing sounds that are heard 24 hours a day, 365 days a year. This noise is annoying and often causes headaches and hearing problems.

**Safety and Reliability**

- Overhead high voltage power lines and towers have been destroyed by tornadoes and ice storms, and they deteriorate from exposure to the weather.

- The 1987 tornado in Edmonton destroyed 66 high voltage steel and 134 wooden towers, and many kilometers of 240 kilovolt and 138 kilovolt power lines. TransAlta spent $8,000,000 to repair the damages.

- The 1998 ice storm in Quebec resulted in 46 deaths attributed to overhead high voltage power outages. Hydro-Quebec’s repair and upgrade costs were $2,800,000,000.
Government Oversight in Alberta

- In 2008, the Alberta Government amended legislation that makes conducting environmental impact assessments unnecessary for high voltage power lines.

- This paves the way to allow transmission companies to damage natural habitats and run overhead lines through environmentally sensitive areas.

- In 2009, the Alberta Government passed legislation making the building of new high voltage power lines easier and with less public and landowner consultation.

Burying High Voltage Power Lines

When compared to overhead high voltage power lines, underground lines are:
- Safer
- More friendly on the environment
- More reliable
- More efficient
- More cost effective

And have less impact on:
- Health
- Property devaluation
- Aesthetics

Prepared by RETA (Responsible Electricity Transmission for Albertans), Updated February 1, 2010.
Go to www.reta.ca for additional facts and references.