

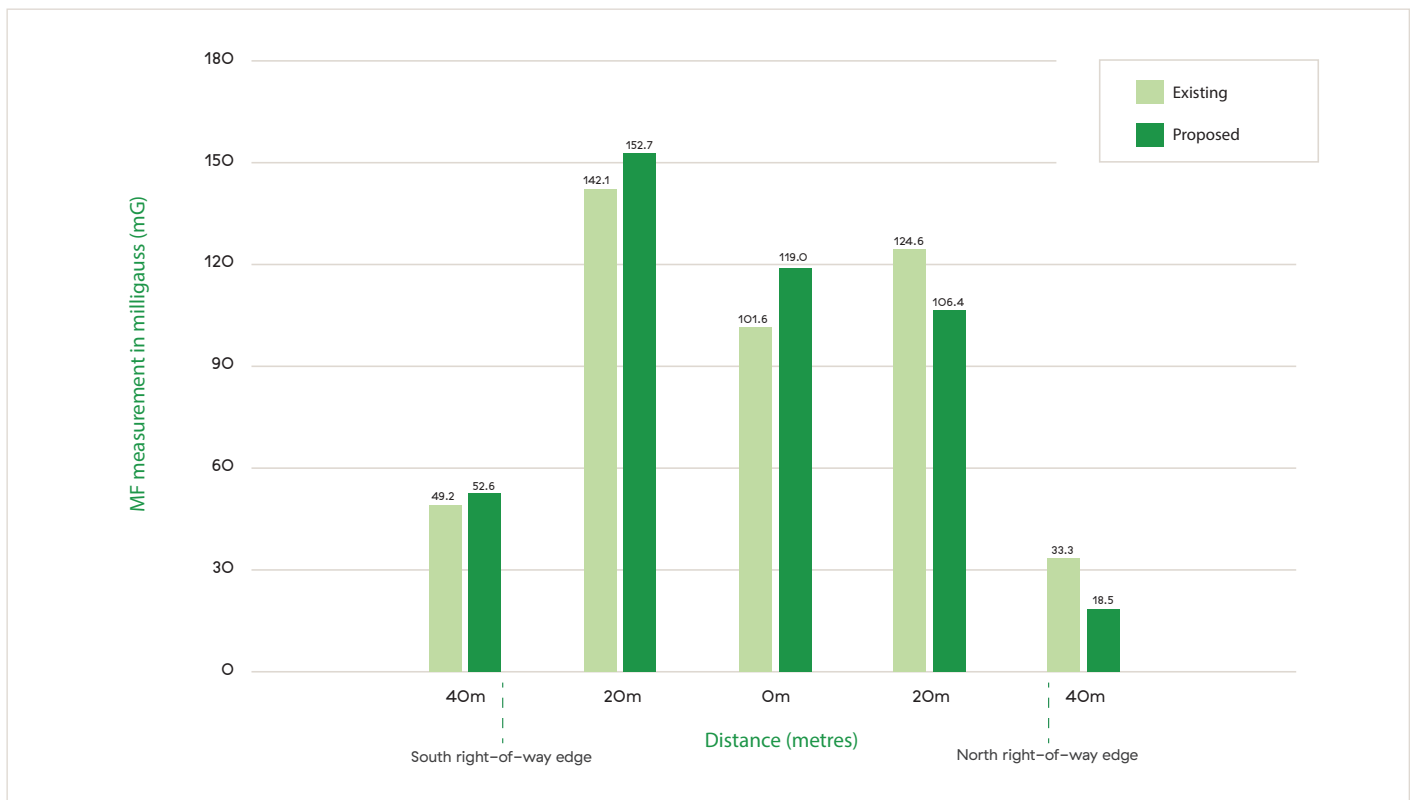
# Metro North Transmission Study

## Typical magnetic field profile along the existing right-of-way in Anmore

This right-of-way currently contains three electrical lines supported by two types of structures – wooden H-frames supporting one 230 kilovolt line and monopoles that support two 230 kilovolt lines.

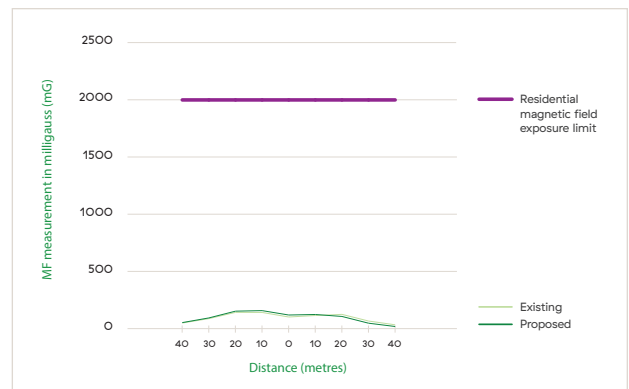
The proposed work will replace the wooden H-frames with fewer, but taller, steel monopoles that will support two 230 kilovolt lines instead of one. The existing monopoles that support two 230 kilovolt lines will remain in place with an added grounding wire.

For the new monopoles, we are arranging the order of the lines to result in lower overall magnetic field (MF) levels at the northern right-of-way edge.



- These estimates are based on average yearly load when the line reaches its maximum rating – the amount of current it is designed to carry near the end of the 30 year study period, or 2045.
- The World Health Organization endorses a residential magnetic field exposure limit of 2000 milligauss (mG).

If you would like to learn more about electric and magnetic fields, please review the sources on page 4 of this handout, request a copy of our booklet called Understanding Electric and Magnetic Fields or visit our website at [bchydro.com/emf](http://bchydro.com/emf)

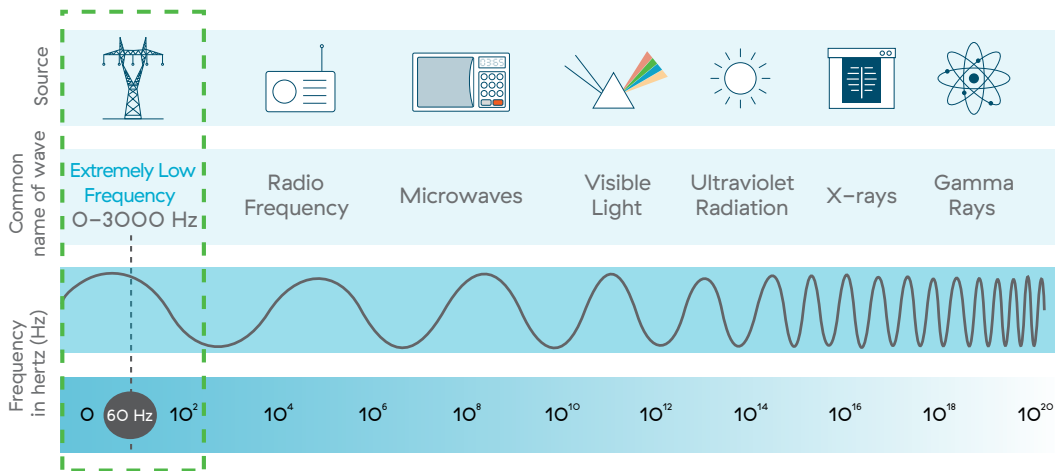


## What are electric and magnetic fields?

Electric and magnetic fields (EMF) are present everywhere electricity flows. Electrical appliances, household wiring and power lines all produce EMF. These fields are part of a broad range of waves called the electromagnetic spectrum, which includes other waveforms such as radiowaves, microwaves, infrared rays, and x-rays.

In North America, power lines' alternative current (AC) standard frequency is 60 Hertz (Hz). That means the current cycles back and forth 60 times per second. The EMF produced by the power line has the same frequency of 60 Hz, categorizing power line EMF as extremely low frequency.

### FREQUENCIES OF THE ELECTROMAGNETIC SPECTRUM AND COMMON SOURCES



This diagram shows the different levels of energy that make up the electromagnetic spectrum. The energy of waveforms increases exponentially as the frequency moves from low to high. Source: Institute of Electrical and Electronics Engineers.

## Comparing electric and magnetic fields

Although they are often referred to together as EMF, electric fields and magnetic fields are actually two distinct components of electricity.

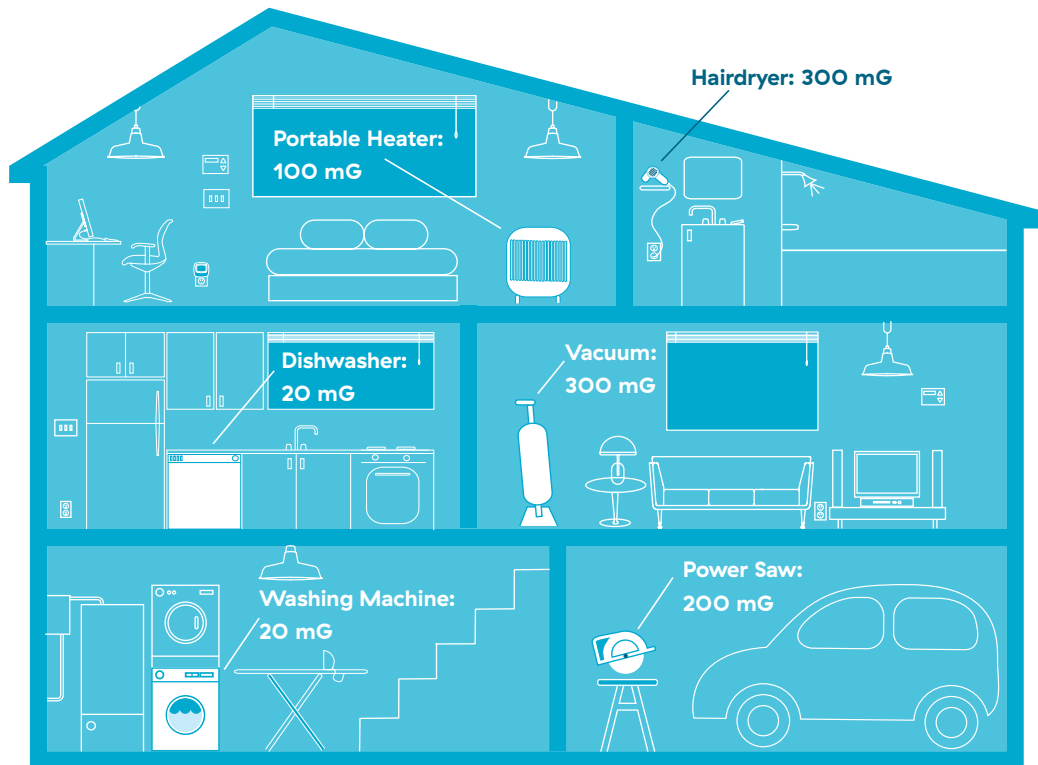
Electric fields are produced by voltage in a wire, such as a power line. An electric field is also present when an electrical appliance is plugged into an outlet even if it's not turned on. They can be blocked or shielded by objects like buildings or trees.

Magnetic fields are produced when electric current is flowing, so they're only present when an electrical appliance is turned on. As the flow of electricity—the current—increases, the magnetic fields increase. Magnetic fields pass through most objects and can't be blocked as easily as electric fields.

For both electric and magnetic fields, the strength of the field decreases rapidly with distance from the source.

Electric fields	Magnetic fields
Produced by voltage; present any time an appliance is plugged in even if it's turned off.	Produced by current; only present when an appliance is plugged in and turned on.
Measured in volts per metre or kilovolts per metre.	Measured in gauss or tesla.
Easily shielded by trees, buildings.	Not easily shielded.

## TYPICAL MAGNETIC FIELD LEVELS IN THE HOME



Source: *EMF in your Environment*, U.S. Protection Agency, 1992.  
All measurements were taken 6 inches from the sources.

## What we do

Electrical equipment and appliances produce electric and magnetic fields (EMF). We recognize that there's public concern about EMF and possible health effects.

Our conclusions are based on research and findings of national and international health authorities. We're guided specifically by the findings of Health Canada and the World Health Organization that EMF from power lines doesn't cause any adverse health effects.

### What are health authorities saying?

Health Canada has confirmed that "there is no conclusive evidence of any harm from exposure to EMF at levels found in homes and schools, including those near power line corridor boundaries" (November 2012).

The World Health Organization supports Health Canada's statement indicating that, despite extensive research to date, there is no evidence to conclude that exposure to low-level electromagnetic field is harmful to human health.

### What are the guidelines?

The World Health Organization endorses the guideline established by The International Committee on Non-Ionizing Radiation Protection (ICNIRP). In its guideline update in 2010, ICNIRP recommends a residential magnetic field exposure limit of 2,000 milligauss (mG).

We follow the ICNIRP guidelines when we build our infrastructure.

The relationship between EMF and health remains a subject of ongoing research. We will continue to monitor scientific research, as well as policy and regulatory developments.

## To Learn More:

If you would like to learn more about EMF, we recommend the following sources:

### BC Hydro's EMF Website

Find the resources below, and new information on an ongoing basis, at our links pages on EMF: [bchydro.com/emf](https://bchydro.com/emf)

### EMF and Health: Review and Update of the Scientific Research

This report was prepared by Exponent to assess the current status of research regarding the potential for health effects from exposure to EMF. Exponent is a leading technical and scientific research firm that provides BC Hydro with a regular weight-of-evidence review on current EMF research. [bchydro.com/emf](https://bchydro.com/emf)

### Health Canada

This fact sheet contains basic information about EMF, typical Canadian exposures, and Health Canada's role. It's Your Health Fact Sheet: Electric and Magnetic Fields at Extremely Low Frequencies  
[hc-sc.gc.ca/hl-vs/alt\\_formats/pdf/iyh-vsv/environ/magnet-eng.pdf](https://hc-sc.gc.ca/hl-vs/alt_formats/pdf/iyh-vsv/environ/magnet-eng.pdf)

### BC Centre for Disease Control

This site includes statements from experts, information on scientific studies, and resources for more information.  
[bccdc.ca/health-info/health-your-environment/electro-magnetic-exposures](https://bccdc.ca/health-info/health-your-environment/electro-magnetic-exposures)

### World Health Organization

This site from the United Nations health agency provides links to EMF fact sheets, extensive research publications, and general information about EMF: [who.int/peh-emf/en](https://who.int/peh-emf/en)

### National Institute of Environmental Health Sciences

The US National Institute site provides information on research conclusions and results, and overall information regarding EMF. [niehs.nih.gov/health/topics/agents/emf/index.cfm](https://niehs.nih.gov/health/topics/agents/emf/index.cfm)

### Canadian Electricity Association

The Canadian Electricity Association (CEA) is the professional association of electrical companies across Canada. You can find information about the CEA's commitments to safety and EMF research on the site. [emf.electricity.ca](https://emf.electricity.ca)

## For more information:

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