

Mrs Schofield  
Barkisland Primary School  
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Our Reference EMF/ 221

Dr Hayley Tripp  
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Dear Mrs Schofield

## **Overhead line, Microshocks and Measurements**

Thank you for contacting National Grid regarding concerns shared by some parents about microshocks being experienced by a small number of children while in the school playing field, especially while playing in the long grass. Both my colleague Janine Dickinson and I met with you on 11 December 2018 and discussed what microshocks are, the safety guidelines that are in place and, whilst on site, we measured the electric and magnetic fields (EMFs) within the school grounds to ensure they fully comply with all requirements – which they do. This letter documents those measurements and also explains what microshocks are as well as practical ways to avoid their occurrence. I have also included links to useful information in this letter, as well as a helpline number should anyone wish to discuss this further.

### **Microshocks**

Microshocks are similar to static shocks that can occur by, for example, walking across a nylon carpet during dry weather. Whilst harmless, we have all probably experienced these before, jumping on trampolines or touching our car door. They can occur close to an overhead line because of the electric field it produces. The electric field induces charges on the surfaces of any conducting objects or people nearby. When two conducting objects that are at different charges touch, the charges equalise and this can be felt as a tingle, or if the difference in charges are bigger, a small shock can be felt. Scientific investigations have shown that the voltages and charges causing static shocks and microshocks are very similar.

The perception of a microshock depends on the size of the electric field, as it is this that determines the extent of charging of the objects concerned. Other factors that can also influence a microshock's perception are the sizes of the objects concerned, how well grounded or insulated they are, meteorological conditions, and the sensitivity of the skin (which varies over the body as well as from person to person).

## **Guidelines and policies applicable to the overhead line**

The health and safety of the people and communities in which National Grid operates is something we take extremely seriously. As such we ensure that all our overhead lines comply with independent EMF exposure limits and policies which have been set by authoritative scientific review bodies to protect us all. These exposure limits are primarily set to protect against health effects rather than microshocks, however provisions have been included to control microshocks.

In the UK, the Government, on recommendations from Public Health England have adopted the guidelines of the International Commission on Non-Ionizing Radiation Protection (ICNIRP). The guidelines contain exposure limits which have been set taking account of all the science investigating potential health effects and EMFs. There are exposure guidelines in place in the UK to protect us against EMF exposure and microshock's. These guideline levels for public exposure are 5000 Volts per meter and 100 microtesla for electric and magnetic fields respectively. Above this level more investigation is needed; the permitted level of exposure is somewhat

## **Measurements of electric and magnetic fields**

Measurements of the electric and magnetic fields around the school playing fields were taken at 11:30am on 11 December 2018 and are documented at the end of this letter. The maximum electric field measured directly under the wires was 2196 volts per meter and 3.2 microteslas. The fields also reduced very quickly with distance away from the wires. Measurements taken on the running track at the closest point to the school were 142 volts per meter and 0.31 microtesla.

All the measurements taken were significantly below the independent health exposure limits and microshocks guidance levels so there are absolutely no issues with the children using the school grounds.

## **Practical ways to avoid microshocks**

The electric fields in Barkisland Primary School's grounds are low enough that you would only expect to receive microshocks very occasionally. The installation of the new running track will help to avoid the microshocks occurring from the grass. Wearing tights or trousers will also help to avoid them.

## **Summary**

The microshocks that have been experienced do occasionally occur under high-voltage power lines, even when, such as the line above Barkisland Primary School, the lines are completely compliant with all the relevant safety criteria. The microshocks are not regarded as harmful, and will only occur very occasionally.

I hope this letter explains what is happening and why. I do understand that this is a topic that is unfamiliar to most people and should you or any parents have any queries relating to this matter please do not hesitate to contact me or one of my colleagues on the EMF helpline: 0845 702 3270 or

[emfhelp@nationalgrid.com](mailto:emfhelp@nationalgrid.com). Additional information about microshocks is available on our website [www.emfs.info/effects/microshocks](http://www.emfs.info/effects/microshocks).

Yours sincerely

A handwritten signature in black ink that reads "A. Tripp". The signature is written in a cursive style with a large, looped initial 'A'.

**Hayley Tripp** BSc(Hons), PhD, CSci, MRSB, MIEEnvSc  
EMF Scientist

**Electric and magnetic field measurements at Barkisland Primary School taken on 11 December 2018**



**Aerial photography of Barkisland Primary School. Blue stars represent the measurement location documented in the table below.**

	Location of measurement	Electric field (volts per metre)	Magnetic field (microtesla)
	Public exposure limits	9000	360
<b>1</b>	Directly under wires on running track	2196	3.2
<b>2</b>	Middle of wires on running track	2130	2.8
<b>3</b>	On running track away from wires	142	0.31
<b>4</b>	Outside school	<20	0.06