ICNIRP
INTERNATIONAL COMMISSION ON NON-IONIZING RADIATION PROTECTION

Public Consultation Template - ICNIRP Draft RF Guidelines, Appendix A, Appendix B

Comments to be uploaded until 9.10.2018

Dear Contributor,

Thank you for participating in the public consultation of the ICNIRP draft guidelines.

Please note that it is important that ICNIRP understands exactly the points that you are making. To facilitate our task and avoid misunderstandings, please:

- be concise
- be precise
- provide supporting evidence (reference to publication, etc.) if available and helpful.

Please provide your details below as per the online form and the provision of the privacy policy

Last name, first name: FAVRE Daniel	Email address: science@alerte.ch	Affiliation (if relevant): Dr. phil. nat. Biologist. President of the A.R.A ., Association Romande Alerte aux Ondes Electromagnétiques (www.alerte.ch)
If you are providing these comments officially **on behalf** of an organization/company, please name this here: Association Romande Alerte aux Ondes Electromagnétiques, A.R.A.), Morges, Switzerland (www.alerte.ch).		
☒ I hereby agree that, for the purpose of the public consultation, **my comments along with my identity (last and first names, affiliation and organization where relevant) will be published** on the ICNIRP website after the consultation phase.		

Please complete the comments table: Please use 1 row per comment. If required, please add extra rows to the table.

	Document (Guidelines, App A, App B)	Line Number #	Type of comment (General/ Technical/ Editorial)	Comment. Proposed change. Context.
1	Guidelines	1-1006	General	ICNIRP has explicitly addressed the issue of non-ionizing radiation (NIR) environmental effects at a workshop in 1999 (see https://www.icnirp.org/en/publications/article/emf-living-environment-2000.html), but has not yet incorporated potential effects on the environment in any of its Guidelines. Since the ICNIRP « provides scientific advice and guidance on the health and environmental effects of non-ionizing radiation (NIR) to protect people **and the environment** from detrimental NIR exposure », these **effects on wildlife** (on both vertebrates and invertebrates) should now be incorporated in the forthcoming Guidelines. The effects on invertebrates and insects in general, and on honeybees in particular, should be especially empasized. The honeybee, as a « sentinel of the environment », is an organism perfectly suited for the analysis of the effects of the NIR. EVALUATION OF THE GUIDELINES For the discussion of the EMF, RF and ELF tresholds, the scientific articles mentioned in the EMF-Portal website https://www.emf-portal.org/en/topics/profile/COM should be taken into consideration, with particularly : • 2018, Koh WJ, Moochhala SM Non-ionizing EMF hazard in the 21th century. IEEE International Symposium on Electromagnetic Compatibility and 2018 IEEE Asia-Pacific Symposium on Electromagnetic Compatibility (EMC/APEMC), 2018.: 518-522 • 2018, Rubtsova N, Paltsev Y, Perov S, Bogacheva E Intensity-time dependence dosing criterion in the EMF exposure guidelines in Russia. Electromagn Biol Med 37 (1): 43-49 • 2018, Tell RA, Tell CA Perspectives on setting limits for RF contact currents: a commentary. Biomed Eng Online 17 (1): 2 • 2017, Foster KR, Ziskin MC, Balzano Q Thermal Modeling for the Next Generation of Radiofrequency Exposure Limits: Commentary. Health Phys 113 (1): 41-53 • 2017, Bisceglia B, Valbonesi S Electromagnetic fields: Scientific basis of regulatory frameworks. IEEE International Applied Computational Electromagnetics Society Symposium - Italy (ACES), 2017. • 2016, Morega M, Calota VC From directive 2013/35/EU to national legislation: Transposition, implementation and assessment work. IEEE International Conference on Applied and Theoretical Electricity (ICATE), 2016.

The scientific article entitled « EUROPAEM EMF Guideline 2016 for the prevention, diagnosis and treatment of EMF-related health problems and illnesses", from Belyaev, I. et al., is providing EMF Guideline in an "overview of the current knowledge regarding EMF-related health risks and provides recommendations for the diagnosis, treatment and accessibility measures of EHS to improve and restore individual health outcomes as well as for the development of strategies for prevention."
https://www.degruyter.com/downloadpdf/j/reveh.2016.31.issue-3/reveh-2016-0011/reveh-2016-0011.pdf
The precautionary guidance values given in this article should be considered not only for humans, but also for other vertebrates and invertebrates. These values are provided in the following Tables 3 and 6 :

Table 3: Precautionary guidance values for radio-frequency radiation.

RF source Max Peak/ Peak Hold	Daytime exposure	Nighttime exposure	Sensitive populations[1)]
Radio broadcast (FM)	10,000 µW/m²	1000 µW/m²	100 µW/m²
TETRA	1000 µW/m²	100 µW/m²	10 µW/m²
DVBT	1000 µW/m²	100 µW/m²	10 µW/m²
GSM (2G) 900/1800 MHz	100 µW/m²	10 µW/m²	1 µW/m²
DECT (cordless phone)	100 µW/m²	10 µW/m²	1 µW/m²
UMTS (3G)	100 µW/m²	10 µW/m²	1 µW/m²
LTE (4G)	100 µW/m²	10 µW/m²	1 µW/m²
GPRS (2.5G) with PTCCH* (8.33 Hz pulsing)	10 µW/m²	1 µW/m²	0.1 µW/m²
DAB+ (10.4 Hz pulsing)	10 µW/m²	1 µW/m²	0.1 µW/m²
Wi-Fi 2.4/5.6 GHz (10 Hz pulsing)	10 µW/m²	1 µW/m²	0.1 µW/m²

*PTCCH, packet timing advance control channel.

Based on: BioInitiative (9, 10); Kundi and Hutter (260); Leitfaden Senderbau (221); PACE (42); Seletun Statement (40). [1)]Precautionary approach by a factor of 3 (field strength)= a factor of 10 (power density). See also IARC 2013 (24) and Margaritis et al. (267).

Precautionary guidance values

In areas where people spend extended periods of time (>4 h per day), minimize exposure to VLF electric fields to levels as low as possible or below the precautionary guidance values specified below.

Table 6: Precautionary guidance values for VLF electric fields.

VLF electric field	Daytime exposure	Nighttime exposure	Sensitive populations
Arithmetic mean (AVG)	0.1 V/m[1)]	0.01 V/m[1)]	0.003 V/m[2)]

Based on: [1)]The current density induced in the human body increases with increasing frequency in an approximately linear relationship (266). Therefore, the guidance value of the electric field in the VLF frequency range should be lower than the one of the 50/60 Hz electric field, e.g. for 10 V/m/100 = 0.1 V/m. For the rationale of 10 V/m and 1 V/m, see section ELF electric fields. [2)]Precautionary approach by a factor of 3 (field strength). See also TCO Development (265).

The precautionary guidance values for the 5G technology should also be incorporated in the Guidelines.

The “definition of biological harmful interference” proposed by the EMR Policy Institute in its September, 2013, Comment to the FCC should also be considered ; see :
http://www.electronicsilentspring.com/definition-biological-harmful-interference/
where the definition of the harmful interference can be found, i.e. :
“Harmful interference includes acute, chronic or prolonged exposure to RF signals and emissions that endanger, degrade, obstruct or repeatedly interrupt biological functioning of a person, plant, animal or ecosystem, or that result in adverse health effects or malfunctioning of medical devices or equipment.
Biological harmful interference shall be defined as any negative change in a measurable biological, physiological or ecological parameter (outside the range within which it is regulated in normal circumstances with no exposure to the influence in question).
Examples of parameters that demonstrate biological effects caused by exposure to magnetic fields or RF fields include:
a. the EEG spindle frequency during sleep (reproducible within a person, not necessarily across a population);
b. the brain metabolic rate based on brain scans of glucose metabolism;
c. the rate of DNA breakage in healthy cells;

				d. disruption of the rate of calcium efflux through a cell's membrane; e. melatonin production and metabolism; f. insulin production and metabolism; g. heart rate and blood pressure variability; h. temperature. (Note that a temporary temperature change of 0.2 degrees Fahrenheit shall be considered a biological effect, because a healthy body normally regulates temperature within a range smaller than this.) Examples of parameters that demonstrate harmful biological effects caused by magnetic and/or RF fields exposed to the environment include: i. the mortality rate of plants or animals; j. the incidence of deformed offspring of plants or animals; k. altered growth or morphology in plants or animals; l. behavioral changes (such as nesting, increased piping signaling of bees or altered feeding habits by any animal)." It's « Comments to the EMR policy Institute » can be found here : http://emrpolicy.org/regulation/united_states/index.htm EFFECTS ON WILDLIFE IN GENERAL The following scientific articles and references, among others, should be considered : Cucurachi, S et al. A review of the ecological effects of radiofrequency electromagnetic fields (RF-EMF). Environment International 51 :116-140, 2013. https://www.sciencedirect.com/science/article/pii/S0160412012002334?via%3Dihub Abstract : Objective: This article presents a systematic review of published scientific studies on the potential ecological effects of radiofrequency electromagnetic fields (RF-EMF) in the range of 10 MHz to 3.6 GHz (from amplitude modulation, AM, to lower band microwave, MW, EMF). Methods: Publications in English were searched in ISI Web of Knowledge and Scholar Google with no restriction on publication date. Five species groups were identified: birds, insects, other vertebrates, other organisms, and plants. Not only clear ecological articles, such as field studies, were taken into consideration, but also biological articles on laboratory studies investigating the effects of RF-EMF with biological endpoints such as fertility, reproduction, behaviour and development, which have a clear ecological significance, were also included. Results: Information was collected from 113 studies from original peer-reviewed publications or from relevant existing reviews. A limited amount of ecological field studies was identified. The majority of the studies were conducted in a laboratory setting on birds (embryos or eggs), small rodents and plants. In 65% of the studies, ecological effects of RF-EMF (50% of the animal studies and about 75% of the plant studies) were found both at high as well as at low dosages. No clear dose–effect relationship could be discerned. Studies finding an effect applied higher durations of exposure and focused more on the GSM frequency ranges.

				Conclusions: In about two third of the reviewed studies ecological effects of RF-EMF was reported at high as well as at low dosages. The very low dosages are compatible with real field situations, and could be found under environmental conditions. However, a lack of standardisation and a limited number of observations limit the possibility of generalising results from an organism to an ecosystem level.We propose in future studies to conduct more repetitions of observations and explicitly use the available standards for reporting RF-EMF relevant physical parameters in both laboratory and field studies. Balmori, A. Electrosmog and species conservation. Science of The Total Environment 496:314-316, 2014. https://doi.org/10.1016/j.scitotenv.2014.07.061 Abstract. Despite the widespread use of wireless telephone networks around the world, authorities and researchers have paid little attention to the potential harmful effects of mobile phone radiation on wildlife. This paper briefly reviews the available scientific information on this topic and recommends further studies and specific lines of research to confirm or refute the experimental results to date. Controls must be introduced and technology rendered safe for the environment, particularly, threatened species. Leach, V. et al. A novel database of bio-effects from non-ionizing radiation. Rev Environ Health. 2018 Jun 6. pii: /j/reveh.ahead-of-print/reveh-2018-0017/reveh-2018-0017.xml. doi: 10.1515/reveh-2018-0017. https://www.degruyter.com/view/j/reveh.ahead-of-print/reveh-2018-0017/reveh-2018-0017.xml Abstract. A significant amount of electromagnetic field/electromagnetic radiation (EMF/EMR) research is available that examines biological and disease associated endpoints. The quantity, variety and changing parameters in the available research can be challenging when undertaking a literature review, meta-analysis, preparing a study design, building reference lists or comparing findings between relevant scientific papers. The Oceania Radiofrequency Scientific Advisory Association (ORSAA) has created a comprehensive, non-biased, multi-categorized, searchable database of papers on non-ionizing EMF/EMR to help address these challenges. It is regularly added to, freely accessible online and designed to allow data to be easily retrieved, sorted and analyzed. This paper demonstrates the content and search flexibility of the ORSAA database. Demonstration searches are presented by Effect/No Effect; frequency-band/s; in vitro; in vivo; biological effects; study type; and funding source. As of the 15th September 2017, the clear majority of 2653 papers captured in the database examine outcomes in the 300 MHz-3 GHz range. There are 3 times more biological "Effect" than "No Effect" papers; nearly a third of papers provide no funding statement; industry-funded studies more often than not find "No Effect", while institutional funding commonly reveal "Effects". Country of origin where the study is conducted/funded also appears to have a dramatic influence on the likely result outcome. See also : https://n432.fmphost.com/fmi/webd#Research_Review_V4 Pall, M.L. Scientific evidence contradicts findings and assumptions of Canadian Safety Panel 6: microwaves act through voltage-gated calcium channel activation to induce biological impacts at non-thermal levels, supporting a paradigm shift for microwave/lower frequency electromagnetic field action. Rev Environ Health. 2015;30(2):99-116. doi: 10.1515/reveh-2015-0001. https://www.degruyter.com/downloadpdf/j/reveh.2015.30.issue-2/reveh-2015-0001/reveh-2015-0001.pdf

				Abstract. This review considers a paradigm shift on microwave electromagnetic field (EMF) action from only thermal effects to action via voltage-gated calcium channel (VGCC) activation. Microwave/lower frequency EMFs were shown in two dozen studies to act via VGCC activation because all effects studied were blocked by calcium channel blockers. This mode of action was further supported by hundreds of studies showing microwave changes in calcium fluxes and intracellular calcium [Ca2+]i signaling. The biophysical properties of VGCCs/similar channels make them particularly sensitive to low intensity, non-thermal EMF exposures. Non-thermal studies have shown that in most cases pulsed fields are more active than are non-pulsed fields and that exposures within certain intensity windows have much large biological effects than do either lower or higher intensity exposures; these are both consistent with a VGCC role but inconsistent with only a heating/thermal role. Downstream effects of VGCC activation include calcium signaling, elevated nitric oxide (NO), NO signaling, peroxynitrite, free radical formation, and oxidative stress. Downstream effects explain repeatedly reported biological responses to non-thermal exposures: oxidative stress; single and double strand breaks in cellular DNA; cancer; male and female infertility; lowered melatonin/sleep disruption; cardiac changes including tachycardia, arrhythmia, and sudden cardiac death; diverse neuropsychiatric effects including depression; and therapeutic effects. Non-VGCC non-thermal mechanisms may occur, but none have been shown to have effects in mammals. Biologically relevant safety standards can be developed through studies of cell lines/cell cultures with high levels of different VGCCs, measuring their responses to different EMF exposures. The 2014 Canadian Report by a panel of experts only recognizes thermal effects regarding safety standards for non-ionizing radiation exposures. Its position is therefore contradicted by each of the observations above. The Report is assessed here in several ways including through Karl Popper's assessment of strength of evidence. Popper argues that the strongest type of evidence is evidence that falsifies a theory; second strongest is a test of "risky prediction"; the weakest confirms a prediction that the theory could be correct but in no way rules out alternative theories. All of the evidence supporting the Report's conclusion that only thermal effects need be considered are of the weakest type, confirming prediction but not ruling out alternatives. In contrast, there are thousands of studies apparently falsifying their position. The Report argues that there are no biophysically viable mechanisms for non-thermal effects (shown to be false, see above). It claims that there are many "inconsistencies" in the literature causing them to throw out large numbers of studies; however, the one area where it apparently documents this claim, that of genotoxicity, shows no inconsistencies; rather it shows that various cell types, fields and end points produce different responses, as should be expected. The Report claims that cataract formation is produced by thermal effects but ignores studies falsifying this claim and also studies showing [Ca2+]i and VGCC roles. It is time for a paradigm shift away from only thermal effects toward VGCC activation and consequent downstream effects. Not only the so-called " voltage-gated calcium channel (VGCC) activation" mentioned above should be considered, but also the effects of NIR on the so-called cryptochromes, see : http://oscillatorium.com/sitebuildercontent/sitebuilderfiles/emfcryptochrome112216.pdf https://ecfsapi.fcc.gov/file/7520958012.pdf A list of scientific references dealing with the environmental aspects of NIR can be found here : https://fr.scribd.com/document/63829925/Is-Electrosmog-hurting-our-wildlife-149-references The recent book from Arthur Firstenberg, entitled "The invisible rainbow – a history of electricity and life", should also be taken into consideration :

				http://www.cellphonetaskforce.org/buy-the-invisible-rainbow/ The book entitled "The Electronic Silent Spring: Facing the Dangers and Creating Safe Limits", from Katie Singer, should also be taken into consideration, see : http://www.electronicsilentspring.com/about/ EFFECTS ON HONEYBEES IN PARTICULAR The following scientific article should be taken into consideration : Favre D. Mobile phone-induced honeybee worker piping. Apidologie 42:270–279, 2011. https://link.springer.com/article/10.1007%2Fs13592-011-0016-x Abstract : The worldwide maintenance of the honeybee has major ecological, economic, and political implications. In the present study, electromagnetic waves originating from mobile phones were tested for potential effects on honeybee behavior. Mobile phone handsets were placed in the close vicinity of honeybees. The sound made by the bees was recorded and analyzed. The audiograms and spectrograms revealed that active mobile phone handsets have a dramatic impact on the behavior of the bees, namely by inducing the worker piping signal. In natural conditions, worker piping either announces the swarming process of the bee colony or is a signal of a disturbed bee colony. The early warnings from Barrie Trower should be considered : https://ecfsapi.fcc.gov/file/7520941855.pdf The arguments of the h.e.s.e. project (The international scientific Internet platform on topical issues) should also be taken into consideration : http://bemri.org/hese-uk/en/issues/nature3e83.html?id=bees
2	Document ?	Line number	Type of comment	Insert your comment. Insert your proposed change. Explain the context of your comment.
3	Document ?	Line number	Type of comment	Insert your comment. Insert your proposed change. Explain the context of your comment.

4	Document ?	Line number	Type of comment	Insert your comment. Insert your proposed change. Explain the context of your comment.
5	Document ?	Line number	Type of comment	Insert your comment. Insert your proposed change. Explain the context of your comment.
6	Document ?	Line number	Type of comment	Insert your comment. Insert your proposed change. Explain the context of your comment.
Continue numbering	Document ?	Line number	Type of comment	Insert your comment. Insert your proposed change. Explain the context of your comment.

Add further rows if needed. For this copy the above row.

And paste it here.