

3835 Acorn Street
Pittsburgh, PA 15207

August 6, 2020

VIA ELECTRONIC FILING

Administrative Law Judge Jeffrey A. Watson
Office of Administrative Law Judge
Pennsylvania Public Utility Commission
Piatt Place, Suite 220
301 Fifth Avenue
Pittsburgh, PA 15222

Re: Miranda Grace Edwards v. Duquesne Light Company
Docket No. C-2018-3002741

Dear Judge Watson:

Attached please find my **Post-Hearing Brief and Proposed Findings of Fact, Conclusions of Law, and Order**. I filed a copy of this document with the Pennsylvania Public Utility Commission ("PUC") today. I also emailed a copy today to your law clerk at dpallas@pa.gov as required by the Interim Order dated July 8, 2020. I also emailed a copy of this document to Mr. Miller.

Sincerely,

/s/

M. Grace Edwards
Complainant
msea.mdew@gmail.com

Attachment

Cc: Shane Miller, Esquire, Counsel for Duquesne Light Company ("DLC") (via email)
(with attachment)

**BEFORE THE
PENNSYLVANIA PUBLIC UTILITY COMMISSION**

MIRANDA GRACE EDWARDS :
 Complainant :
 v. :
 :
DUQUESNE LIGHT COMPANY :
 Respondent :

Docket No. C-2018-3002741

**POST-HEARING BRIEF AND
PROPOSED FINDINGS OF
FACT, CONCLUSIONS OF
LAW, AND ORDER**

Filed on behalf of Complainant
Miranda Grace Edwards, Pro Se

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February 14, 2020 Complainant filing of nine exhibits (detailed on following page)

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EXHIBIT B: Letter from DLC to Complainant reserving the “right” to petition the Pennsylvania Public Utilities Commission (“PUC”) to install a smart meter on Complainant’s property before her formal complaint is resolved

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EXHIBIT G: American Academy of Environmental Medicine, Recommendations regarding Electromagnetic and Radiofrequency Exposures (July 12, 2012)

EXHIBIT H: Davis, Devra: Environmental Health Trust Research Letter to Staff at Teton National Park Re: Telecommunications Infrastructure Plan EA (April 10, 2019)

EXHIBIT I: Priyanka Bandara, David O. Carpenter, “Planetary electromagnetic pollution: it is time to assess its impact”, The Lancet Planetary Health, Volume 2, Issue 12, 2018, Pages e512-e514, ISSN 2542-5196, [doi.org/10.1016/S2542-5196\(18\)30221-3](https://doi.org/10.1016/S2542-5196(18)30221-3)

INTRODUCTION

This brief is submitted by Miranda Grace Edwards (“Complainant”) to support her claim that the installation by Duquesne Light Company (“DLC”) of an AMI smart meter at her home will adversely affect her and is neither “safe” nor “reasonable” under 66 Pa. C.S. § 1501 as to her.

Complainant brought her case against DLC in response to DLC’s insistence that the Complainant acquiesce to DLC’s demands to install a smart meter on her home or be subject to imminent loss of electricity. The Complainant was informed that prompt filing of a formal complaint with the PUC against DLC was the sole method by which she could retain electrical service while refusing to consent to the installation of an activity-monitoring device that also carries a fire risk and potential health effects.

The quality of being safe means the absence of risk or harm. DLC takes the extreme and unreasonable position that RF exposure from its smart meters is utterly incapable of causing harm, as if that position had been scientifically proven and generally accepted in the scientific community. To the contrary, reliable scientific evidence shows that RF exposure from smart meters such as DLC’s, as well as RF exposure from cell phones and towers, is a possible cause of biological harm to humans, animals, and vegetation.

Complainant, acting *pro se*, attempted to submit evidence demonstrating risks associated with smart meters at an 11-hour hearing on February 27, 2020, pursuant to the Order of ALJ Jeffrey A. Watson. The PUC need not resolve the scientific disagreement between the parties to resolve this case. The evidence at the very least shows potential harm to Complainant and other ratepayers from RF exposure such as that emitted from smart meters. ALJ Watson prevented all such evidence from being submitted by Complainant during the lengthy hearing, which continued until 11 p.m. ALJ Watson insisted on continuing the hearing without a dinner break; as a result, DLC’s eight industry-paid witnesses were able to stagger their testimony throughout the day but Complainant had to remain present for more than 11 hours. ALJ Watson’s conduct does not negate the existence of the evidence Complainant presented.

The question of undue influence on the PA PUC in this matter has been raised in a number of quarters. The Courts, in deciding actual cases, have ruled that any contract that is obtained or imposed through undue influence is invalid. No contract can be rightfully formed unless there has been a “meeting of the minds,” and there has been no “meeting of the minds” between Pennsylvania electric distribution companies

("EDCs") and ratepayers concerning smart meters. Moreover, there are legal protections that stipulate no one can be forced to comply with an unrevealed contract between private corporations to which they were never a party and of which they had no knowledge. There has been no credible cost-benefit and risk analysis provided to the public. There has been no transparency at all to taxpayers. There has been very little accurate information provided to the general public.

In almost every state where smart meters have been deployed, customers have the ability to opt out, which gives concerned ratepayers the chance to protect themselves and minimize effects on wildlife, pets, and vegetation in their immediate area. Pennsylvania is a notable exception, where the PUC seems to have willfully misinterpreted Act 129 and required every ratepayer to accept a smart meter without exception, even ratepayers who object based on medical concerns. The PUC's flawed interpretation of Act 129 violates the Act's plain meaning.

DLC's smart meters present a risk of harm to Complainant and all DLC customers forced to accept these meters or lose electric service. Forcing unwilling ratepayers to accept smart meters that will compromise their safety offends fundamental principles of respect for personal autonomy and constitutes unreasonable and unsafe service to Complainant and other ratepayers in violation of section 1501.

The evidence is amply sufficient for Complainant to meet her burden under section 1501. The PUC should order DLC not to install a smart meter at Complainant's home.

HISTORY OF THE PROCEEDINGS

On June 1, 2018, Complainant attempted to initiate an informal complaint process by phone with the PUC against DLC because of DLC's refusal to desist from installing a smart meter on her property or even delay installation of a smart meter. Complainant was told by a representative of PUC that an informal complaint would have no effect on her situation, but this statement contradicts PA Code §56.92:

"A public utility may not mail or deliver a notice of termination if a notice of initial inquiry, dispute, **informal or formal** complaint has been filed and is unresolved and if the subject matter of the dispute forms the grounds for the proposed termination. A notice mailed or delivered in contravention of this section is void." (Emphasis added)

Complainant filed a formal complaint against DLC on June 14, 2018, after a DLC employee made an unannounced visit to her home on June 12, 2018, and delivered to

Complainant a three-day shut-off notice threatening to cut off electricity service to her residence on June 15, 2018. The shut-off notice claimed “non-access” was the reason for the threatened termination. Denied access to the informal complaint process, Complainant had less than three days to complete and file her original formal complaint against DLC simply to prevent her electricity from being shut off. Complainant was and is acting *pro se* in this case and was entirely unfamiliar with procedures. Before filing her original formal complaint, Complainant spoke with another PUC representative who also did not mention that according to PA Code §56.92, the unresolved informal complaint Complainant attempted to register should have rendered DLC’s shutoff notice void.

On October 24, 2018, Administrative Law Judge (ALJ) Jeffrey Watson issued an interim order regarding this case. In the Procedural Background section of the order, he stated: “Complainant also averred that Respondent provided her with a termination notice after she filed a formal complaint.” This statement is factually incorrect. As Complainant has recounted above, in her original complaint, and in her amended complaint, DLC served a 72-hour termination notice to Complainant on June 12, 2018. Complainant filed her original formal complaint on June 14, 2018. In his order, ALJ Watson misinterpreted Complainant’s claim that PUC itself actively prevented her from filing an **informal** complaint on June 1, 2018, and that by doing so PUC acted in violation of **PA Code §56.92, §56.142, §56.151, and §56.162-§56.166.**

On November 28, 2018, an interim order was entered establishing an “initial litigation schedule.” This order specified January 4, 2019, as the date by which “any Party wishing to present expert testimony of any person other than Complainant must provide to the other Party in writing, the name and business address of that person and a written summary of the expected testimony of that person.” The order also specified that on the same date, “any Party wishing to present expert testimony (including but not limited to medical, technical, etc.) must provide to the other Party in writing, the name and business address of that person and a written summary of the expected testimony of that person.”

On December 10, 2018, Complainant filed a motion to adjust the initial litigation schedule. Complainant stated that the specified deadline of January 4, 2019, was impossible for her to meet. The interim order of November 28, 2018, was filed six days after Thanksgiving—well into the holiday season when Complainant, and likely most experts, have increased family obligations. Moreover, this *pro se* Complainant is a single parent, and has a full-time job and other responsibilities. She did not already know suitable witnesses to contact at the time the November 28 interim order was entered. By contrast, DLC has a stable of paid witnesses lined up to testify in response to multiple complaints. Complainant requested more time, asking to extend the January 4, 2019, deadline to February 28, 2019; to extend the February 28, 2019 deadline to

conclude discovery to April 25, 2019, and to extend the date to file a “progress report” from March 11, 2019, to May 7, 2019.

Complainant received no response from either PUC or DLC concerning her motion to adjust the initial litigation schedule.

On December 18, 2018, DLC filed a motion to extend the discovery response deadline. This motion was granted and also agreed to by Complainant.

On or about January 31, 2019, Complainant received an envelope from DLC Counsel via U.S. mail. The envelope contained a two-paragraph letter dated January 30, 2019, and a CD with 21 files constituting DLC’s responses to Complainant’s discovery requests. DLC supplied no direct answers to any of Complainant’s questions.

On March 4, 2019, Complainant filed an amended formal complaint that noted—among other matters—the PUC’s violation of PA Code **§56.92**, ALJ Watson’s misinterpretation of Complainant’s original formal complaint in his Interim Order of October 24, 2018, and DLC’s lack of response to Complainant’s discovery questions.

DLC sent a letter via U.S. mail to Complainant dated March 25, 2019, that stated in part, “Paragraph 35 of your Amended Complaint indicates that you received a two-paragraph letter and a CD containing 21 files, but you did not receive any additional discovery responses from Duquesne Light. Duquesne Light intended to provide you with written discovery responses with the CD that you received, but these responses apparently did not reach you.” DLC enclosed written responses with the March 25, 2019, letter. PUC never responded to Complainant’s claims as set forth in the amended formal complaint. Complainant received the letter and discovery responses on March 27, 2020.

On December 20, 2019, the PUC issued a Call-Out Telephone Notice for an Initial Telephonic Hearing. The hearing was scheduled for February 27, 2020, at 10 a.m.

On December 20, 2019, Complainant filed a Motion to Stay of Proceedings until after the Commonwealth Court’s ruling on *William and Jean Haas, Petitioners v. Pennsylvania Public Utilities Commission, Respondent*, Docket No. 658 MD 2019—the outcome of which would directly affect the instant complaint.

On January 9, 2020, DLC filed an Answer in Opposition to Motion to Stay of Proceedings, claiming DLC would “be harmed by a stay” because DLC “is required by Act 129 of 2008 and its Smart Meter Plan to install a smart meter at Complainant’s residence.” DLC cited Complainant’s failure to file a status report by November 18, 2019, as a relevant fact in their answer.

On January 31, 2020, Complainant filed an Objection to the Response and Objections of Duquesne Light Company dated January 9, 2020, arguing that if William

and Jean Haas prevail in their case, “The proceedings of my Formal Complaint C-2018-3002741 will be moot because I can continue to receive electricity from DLC without being forced to accept their “smart meter” on my property. The issues raised in William and Jean Haas, Petitioners v. Pennsylvania Public Utilities Commission, Respondent, Docket No. 658 MD 2019, align with and are directly relevant to my Formal Complaint C-2018-3002741.”

On February 12, 2020, Complainant filed a Second Motion to Stay of Proceedings after the PA Commonwealth Court’s ruling on *Povacz v. Pennsylvania Public Utilities Commission*, Docket No. 492 CD 2019—the outcome of which would directly affect the instant complaint. *Povacz v. Pennsylvania Public Utilities Commission* was argued on June 10, 2020. Given that the Commonwealth Court has recently ruled on cases heard around the same time, a ruling is anticipated soon.

On February 21, 2020, ALJ Watson issued an Interim Order denying Complainant’s December 20, 2019, Motion to Stay of Proceedings. ALJ Watson stated as the main reason for denying the motion, “The Commission has adopted the standards set forth in Pa. PUC v. Process Gas Consumers Group, 502 Pa. 545, 467 A.2d 805 (1983) (Process Gas) for guidance regarding the issuance of a stay or supersedeas.”

On February 22, 2020, Complainant and DLC counsel (Shane Paul Miller) spoke by phone. Mr. Miller stated that as he saw it, the parties had three options: 1. Go ahead with the hearing; 2. Stay the case until Povacz decision is rendered by the Commonwealth Court; and 3. settle the case between Complainant/me and DLC (“amongst ourselves”). Parties had previously discussed option 3 via email, but didn't get far because DLC offered to move the smart meter at Complainant’s expense as the only solution. Among other problems, this solution was physically impossible because of Complainant’s small property.

Mr. Miller stated DLC “would be willing to consent to the stay” only if Complainant would “limit the complaint only to the legal issues” (i.e., whether Act 129 makes smart meters mandatory). He wanted Complainant to agree to forfeit her right to include factual issues concerning her interactions with DLC and safety, health, and privacy concerns with smart meters.

Complainant declined to limit her complaint, and commented that it sounded like Mr. Miller was saying DLC had authority over whether the stay would be granted and that from her understanding, that decision is up to the ALJ.

On February 24, 2020, DLC filed an Answer in Opposition to Motion to Stay of Proceedings.

Complainant has no record of ALJ Watson's dismissal of Complainant's Second Motion to Stay of Proceedings; however, this motion was effectively dismissed because the proceedings were not stayed.

On February 27, 2020, the initial telephonic hearing took place. During the 11+-hour hearing, ALJ Watson refused the introduction of ANY evidence contrary to the DLC position that smart meters are safe—even factual, easily verifiable information about opt-out provisions in other states and studies written by and backed by established scientists researching potential biological harm.

ALJ Watson routinely made rude and sarcastic comments to Complainant and shouted at her on multiple occasions. When Complainant pointed this out, ALJ Watson said that he's "very soft-spoken" and just wanted to make sure he was being heard. After that exchange, he was careful not to raise his voice but continued to exhibit a disrespectful attitude toward Complainant. He frequently noted the time of day and duration of the hearing after Complainant stumbled, paused, or finished questioning a witness. When Complainant fell silent for too long he would say, "Take your time." Complainant was sitting in her kitchen throughout the hearing, trying to take notes while participating in the proceedings and surrounded by stacks of DLC's paper exhibits that took time to sort through.

At around 4:30 p.m., when Complainant started asking if the court would consider finishing the hearing on another day, ALJ Watson said, "Let's just do the highest priority witnesses and then we'll revisit it." He subsequently decided to keep pushing through to the end without giving Complainant the chance to express an objection. ALJ Watson said that the DLC witnesses' schedules had to be accommodated and some of them had been sitting there all day. But they didn't have to be present for the entire hearing, while Complainant did.

One of Complainant's friends who called in to listen to some of the hearing reported that ALJ Watson "was a total dick" to her while Complainant was dropped off the call temporarily.

By contrast, ALJ Watson complimented DLC counsel on their huge stacks of exhibits. The lawyer chuckled and apologized at ALJ Watson's comment. ALJ Watson replied, "I meant that in a good way, heh heh."

Complainant had to ask ALJ Watson directly to receive any information about obtaining a transcript. He said to contact his office to obtain one. This did not sound like a normal procedure to the admittedly inexperienced *pro se* Complainant, who was led to wonder whether ALJ Watson had a chance to "edit" the transcript before anyone else saw it. But without paying \$1,400, Complainant will never know.

On April 8, 2020, ALJ Watson entered an interim order permitting the filing of briefs on or before May 29, 2020. Neither party did so.

On June 1, 2020, ALJ Watson closed the evidentiary record.

Complainant did not learn of the April 8, 2020, interim order or the June 2, 2020, interim ruling until July 6, 2020, when she received DLC's brief via U.S. mail.

On July 8, ALJ Watson issued an order extending the briefing schedule.

Complainant learned from the transcription service that purchasing the hearing transcript would cost \$1,400. Complainant was told that the cost is based on the number of pages in the transcript. Complainant learned from Audley Brown and Shirley Spunaugle of the PUC that because the PUC offices have closed indefinitely due to COVID-19, transcripts are not available to view in person. Because of contracts with the transcription services, the PUC cannot provide transcripts for Complainants by any method other than in-person viewing. Complainant has no way to reference the transcript pages in this brief as required by PUC regulations.

SUMMARY OF ARGUMENT

Throughout this formal complaint process, Complainant has argued that the PUC's interpretation of Act 129 of 2008 electricity savings law (66 PA.C.S.— Omnibus Amendments Act of Oct. 15, 2008, P.L. 1592, No. 129, §2807(f)(2) ("Act 129")) and forcing installation of "smart meters" on customers who have not agreed to, consented to, or requested the installation contravenes the clear and unambiguous language of Section 2807 (f)(2) of Act 129. **The PUC's interpretation of Act 129 violates the *Statutory Construction Act of 1972, 1 Pa.C.S. §§1501-1991***, well-settled case law regarding the interpretation of statutes, and tramples the Article I constitutional rights of customers who resist the installation of such meters.

The General Assembly's enactment of Section 2807(f)(2) contains clear and unambiguous language. The General Assembly made a policy decision to allow the installation of smart meters when the customer consented, requested, or agreed to the installation. Regarding the question of whether a customer can "opt out" of the smart meter plan, Act 129 clearly states that a customer must "request" or "consent" to participation in the smart meter program. Contrary to the PUC's interpretation, the Senate floor remarks (as referenced on pages 20 and 21 of this brief) unambiguously corroborate the legislature's intentional refusal to mandate smart meters for every ratepayer. The PUC disregarded the clear language of the statute and essentially amended the legislative enactment.

Taken *in toto*, Act 129 § 2807(f)(2)(iii), as per the definition of depreciation based on the authorities discussed herein, as used repeatedly in the PA Public Utilities Code, and mirrored by the PUC's Implementation Order, sets a cap on the service period of smart meters, dictating their service life does not exceed 15 years. The final version of § 2807 passed into law says nothing about replacing electromechanical analog meters

and nothing about universal forced deployment of smart meters. No such inferences as these can be made from the statutory language of Act 129, from the “intent” as recorded in the *House* and *Senate Journals* in the legislative history of HB 2200 that became Act 129, nor in the changes to the Bill wording through each Printer’s Number, culminating with the final version (PN 4526) passed into law.

Thus, there is no basis on which the PUC can justify its mandate of universal forced deployment of smart meters in their Implementation Order of June 2009 and all subsequent PUC formal complaint holdings and Implementation Orders. Consequently, the EDCs, including DLC, have no legal basis on which to force smart meters on all of their customers.

Complainant is NOT requesting, nor has she ever requested, a smart meter. She does not live in new building construction—and therefore is not required to have a smart meter under any legal interpretation of Act 129. The reason she does not have one is because she did not request one, and does not live in new building construction. She does not want a smart meter and there is no reason under the law that she must accept one on the electric socket of her home as a condition of receiving electricity from her EDC at the Service Address. Section 2807(f)(2)(iii) only deals with furnishing smart meters that have exceeded their useful life (not to exceed 15 years). It does not require Complainant or anyone else similarly situated to have a smart meter.

ARGUMENT

A. The PUC misinterprets the plain language of Act 129.

In Act 129 of 2008 (the Act), PA C.S. § 2807(f)(2) states:

(f)(2) Electric distribution companies shall furnish smart meter technology as follows:

- (i) Upon request from a customer that agrees to pay the cost of the smart meter at the time of request.
- (ii) In new building construction.
- (iii) In accordance with a depreciation schedule not to exceed 15 years.

Controversy has arisen over the Pennsylvania Public Utility Commission’s (PUC’s) implementation of this section of the Act. As can be demonstrated by the PUC’s own Implementation Order of June 2009,¹ Pennsylvania’s legislative history and various accounting and tax authorities and definitions, the PUC does not interpret the plain language of this law correctly.

¹ Docket No. M-2009-2092655

The PUC Implementation Order of June 2009² on page 14 states, “The Commission believes that it was the intent of the General Assembly to require all covered EDCs to deploy smart meters systemwide when it included a requirement for smart meter deployment “in accordance with a depreciation schedule not to exceed 15 years.”

Thus, the PUC forces the plain language of § 2807(f)(2)(iii) into a mandatory smart meter narrative which has thereby aided and abetted most electric distribution companies (EDCs) to force smart meters on all customers, even over their objections for various reasons. The PUC arrives at the incorrect conclusion that Act 129 creates a statewide mandate of smart meters by covered EDCs by misinterpreting unambiguous legislative intent and misinterpreting plain legislative language that leaves no room for misinterpretation.

The PUC and EDCs have overridden the plain language meaning of § 2807(f)(2)(iii). The PUC interprets the language of furnishing of smart meters “in accordance with a depreciation schedule not to exceed 15 years” to mean covered EDCs must force smart meters on all customers within 15 years. In addition, the PUC conflates furnishing smart meters with removal of analog meters, when, in fact, the Act is silent on currently deployed analog meters.

The following discussion focuses on subparagraph (f)(2)(iii) of the Act:

“Electric distribution companies shall furnish smart meter technology as follows ...in accordance with a depreciation schedule not to exceed 15 years.”

Interpreting this as a mandatory rollout of smart meters within 15 years not only lacks common sense, but also ignores a key term found in the law—“depreciation.” Since “depreciation” is an accounting or tax term, it is necessary to consider how applicable authorities define the term “depreciation.”

Internal Revenue Code³ (IRC) § 167(a) and Treasury Regulation (Treas. Reg.) §1.167(a)-1(a) define depreciation as an allowance (deduction) for the exhaustion, wear and tear, and obsolescence of property used in a trade or business or property held for the production of income. Treas. Reg. §1.167(a)-1(a) goes on to dictate that depreciation deductions are allocated over an asset’s useful life.

² Docket No. M-2009-2092655

³ Internal Revenue Code of 1986, as amended

*Black's Law Dictionary*⁴ mirrors this, defining depreciation as a decrease in the potential of an asset over its lifetime. Various financial accounting authorities have the same or similar definitions, such as the Federal Energy Regulatory Commission (FERC).⁵ These definitions show that the terms wear and tear, exhaustion, or obsolescence are synonymous with the term depreciation. A depreciation schedule (or wear and tear schedule, exhaustion schedule, obsolescence schedule) is a schedule that ultimately defines an asset's useful life, and allocates its cost over its useful life. In fact, Treas. Reg. §1.167(a)-1(b) defines useful life as the period over which an asset may reasonably be expected to be useful in a trade or business or for the production of income (not necessarily the useful life inherent in the asset—but its use in business or for income production).

FERC, when it comes to defining the term “depreciation,” mirrors what has already been presented above. In establishing standards for depreciation for accounting purposes, FERC wanted to ensure that electric utilities charge proper amounts of depreciation to expense in each financial reporting period for the purpose of allocating in a systematic and rational manner the cost of utility property to the periods which the property is used in utility operations (over its estimated useful service life).⁶ The definition of depreciation according to FERC's Uniform System of Accounts for electric utilities is “the loss of an asset's service value not restored by current maintenance.”⁷ This is further evidence that “depreciation” is an accounting term tied to the expenditure of the cost of an asset (such as a smart meter) over its period of use, or useful life. FERC does not somehow make the term “depreciation” mean deployment, nor does any other accounting or tax authority. “Deprecation” never means “deployment.”

Based on the definition of “depreciation” and “useful life” as used in legal and accounting contexts, the plain statutory language of § 2807(f)(2)(iii) must be interpreted as follows—using terms synonymous with depreciation to aid in interpretation:

Electric distribution companies shall furnish smart meter technology as follows ... in accordance with a wear and tear, exhaustion, or obsolescence schedule not to exceed 15 years.

In other words, § 2807(f)(2)(iii) establishes the maximum service life of smart meters. This paragraph of the Act makes no reference to a mandatory rollout of smart meters

⁴ <https://thelawdictionary.org/depreciation>

⁵ The Federal Energy Regulatory Commission (FERC) is an agency that regulates the interstate transmission of electricity, natural gas, and oil. FERC also administers accounting and financial reporting regulations of regulated companies—such as EDCs.

⁶ 65 FR 47664, page 47666

⁷ 18 CFR 101. Definition No. 12

by all EDCs (regardless of their number of customers—which shall be addressed further below). It does not say, nor can it be inferred in any way, that there is a required systemwide deployment of smart meters on a schedule of no longer than 15 years, as stated in the PUC's 2009 Implementation Order. This section of the Act does not refer to replacing AMR meters or analog meters. Rather, it plainly spells out that AMI (smart meters) are to have a service period not to exceed 15 years.

The General Assembly had also previously enacted laws including parameters regarding the term “depreciation” as part of the Public Utility Consolidated Statutes. Section 1703 of Title 66 states:

§1703. Depreciation accounts; reports.

(a) Accounts.—Every public utility shall carry on its books or records of account, proper and reasonable sums representing the annual depreciation on its property used or useful in the public service, which sums shall be based upon the average estimated life of each of the several units or classes of depreciable property. The commission, by appropriate order, after hearing, shall, except where found to be inappropriate, establish for each class of public utilities, the units of depreciable property, the loss upon the retirement of which shall be charged to the depreciation reserve. (underlining added)

66 Pa. C.S. 1703(a).

66 Pa.C.S. §1703 (b) states:

(b) Statements.—Every public utility shall file with the commission, at such times and in such form as the commission may prescribe, statements setting forth the details supporting its computation of annual depreciation, as recorded on the books or records of accounts of the public utility. If the commission, upon review of such statements, is of the opinion that the amount of annual depreciation so recorded by any public utility is not reasonable and proper, it may, after hearing, require that provision be made for annual depreciation in such sums as may be found by it to be reasonable and proper. In making its findings, the commission shall give consideration to the experience of the public utility, and the predecessors of the public utility in accumulating depreciation reserves, the retirements actually made, and such other factors as may be deemed relevant. (underlining added)

66 Pa. C.S. §1703 (b).

Clearly the General Assembly was familiar with the term “depreciation” when it made a policy decision to specify the “useful life” for depreciation purposes relative to smart meters. That decision is consistent with Section 1703.

Section 2807(f)(2) in its entirety as written by the General Assembly means that the only

way homeowners would be furnished their first smart meter was to request one and pay for its cost at time of such request, if the homeowner is living in existing construction. In new construction, smart meters “shall be furnished” or provided. Thereafter, the smart meter that was furnished must be replaced with a new smart meter over a period not to exceed 15 years.⁸

The Commission incorrectly interprets (f)(2)(iii) as a requirement for system-wide smart meter deployment within 15 years with no exceptions. The Commission has substituted “deployment and installation schedule” for “depreciation schedule.” Nowhere does any authority define or use the terms “deployment” or “installation” as synonymous with the term “depreciation.”

Furthermore, *Black’s Law Dictionary* states: “Definition of **FURNISH**: To supply; provide; provide for use.”⁹ Section 2807(f)(2) of the Act requires EDC’s to FURNISH smart meter technology under three conditions only. It does not require the EDCs to install or deploy smart meter technology everywhere in their territories with no exceptions. Thus, neither “furnish” nor “depreciation schedule” can be in any legal way construed to mean “install” or “deploy”, much less connote “mandatory deployment and installation.”

Section 2807(f)(6) of the Act states that subsection (f) does not apply to EDCs with 100,000 or fewer customers. This does not mean that customers of all EDCs with 100,001 or more customers must accept a smart meter, rather it means that (f)(2)(i), (f)(2)(ii), and (f)(2)(iii) do not apply to EDCs with 100,000 or fewer customers. All this means is that an EDC with 100,000 or fewer customers does not have to furnish a smart meter upon request from a customer and that a smart meter does not have to be furnished in new construction. It does not mandate smart meters on customers of EDCs with 100,001 or more customers.

Section 2807(g) of Act 129 does include definitions of smart meter technology, including that it shall enable time-of-use rates, HOWEVER, the ONLY section of Act 129 that discusses how this technology “shall be furnished” is section (f).¹⁰

B. The lawmakers who finalized Act 129 did not intend it to be a mandatory smart meter deployment.

⁸ It should be noted that there does not appear to be any prohibition from an EDC asking a customer if they would want to consent to the installation of a smart meter if a customer would not fall under 2807(f)(2)(i) or (ii). Instead, covered EDCs have been forcing smart meters on customers not falling under 2807(f)(2)(i) or (ii).

⁹ <https://thelawdictionary.org/furnish>

¹⁰ As smart meters are provided to those who request one, and in new building construction, time-of-use rate requirements are honored.

Additional clarity is afforded by reviewing the third clauses of § 2807(f)(2) of the Printer's Numbers (PNs) of versions of House Bill 2200 that were NOT passed into law to see what language was excluded from the final version which was passed into law. PNs 3218 and 3233 (February 11 and 12, respectively, 2008) both stated, "Electric distribution companies shall furnish smart meter technology to: ... (C) One hundred percent of its customers within ten years after the effective date of this paragraph." The *House Journal* records numerous dissenting comments about the mandatory nature of these PNs.

- I. House Journal, February 11, 2008, pages 386-403 [p. 390 Mr. Hutchinson; 390-391 Mr. Godshall; p. 392 Mr. McCall; p. 393 Rep. Smith and Mr. Saylor; p. 395 Mr. Benninghoff; p. 397 Mr. Gabig]
- II. House Journal, February 12, 2008, pages 430-432 [p. 431: Mr. Hutchinson]

PN 4429 (September 23, 2008) stated, "ELECTRIC DISTRIBUTION COMPANIES SHALL FURNISH SMART METER TECHNOLOGY AS FOLLOWS: ... (III) IN ACCORDANCE WITH A SCHEDULE OF REPLACEMENT OF FULL DEPRECIATION OF EXISTING METERS."

Note here, that PNs 3218 and 3233 which mandated smart meters for all customers, and PN 4429 which made reference to retiring from service and replacing existing (mostly analog) meters were NOT PASSED INTO LAW. It is also worth noting that there would be no way to logically think "depreciation" could be synonymous with "deployment" in the paragraph above from PN 4429. It simply makes no sense. Also noteworthy is that PN 4429, again—which was NOT passed into law—would have required covered EDCs to replace fully depreciated existing (presumably analog/mechanical) meters that had exceeded their useful life with smart meters.

However, this language in PN 4429 was changed, and is in sharp contrast to the language that was passed into law.

Any interpretation of §2807(f)(2)(iii) of the Act, such as the PUC and EDCs espouse, that it mandates smart meters for all customers or that it makes any reference at all to existing analog meters is erroneous, because those interpretations are based on language that the PA legislature purposefully modified and are based on language that was NOT PASSED INTO LAW. The prior PNs of the Act that were NOT passed into law should not have formed the basis for the PUC's Implementation Order of June 2009, which the PUC and all of its Administrative Law Judge's (ALJs) cite for the purpose of ruling against every single smart meter formal complaint to date.

In addition to the clear plain English understanding of Act 129 §2807(f)(2)(iii)'s reference

to a 15-year depreciation schedule are the *Senate Journal* records of PN 4526, the version that WAS signed into law.

Discussion of PN 4526 in the Senate is recorded in the *Senate Journal* on October 8, 2008, pages 2626-2631, from which the following comments pertinent to smart meters and concerns about customers are taken. Here is a link:

<https://www.legis.state.pa.us/WU01/LI/SJ/2008/0/Sj20081008.pdf#page=13>

p 2626

Senator TOMLINSON.

It also contains language in there that we will have smart meters. **It is not mandated**, but it allows for the deployment of smart meters through a depreciation process, through new home construction process, and through the depreciation of 15 years, and **for anyone who wants to purchase a smart meter which they feel will help them manage their electric load better.**

p. 2627

Senator BOSCOLA.

We also made sure that smart meters would not be mandated for every single ratepayer. Not only is that a smarter approach to smart meter deployment, but it will also save electric customers hundreds of millions of dollars paying for something that will not provide a real benefit in their own households.

p. 2629

Senator FUMO.

In addition, **we did not mandate smart meters, but we made them optional.** We did say in new construction, where they really are practical, they will be put in.

C. The PUC twists the meaning of the word “depreciation” in its Implementation Order of June 2009.

In its Implementation Order of June 2009, on page 12 (where new construction is discussed), the PUC states the following: “As with all equipment, meters have a useful life. EDCs determine how much to invest in meter equipment based on its useful life and have an opportunity to depreciate that investment over the useful life of the meter. In addition, EDCs have an opportunity to recover the cost of the meter from ratepayers.” As shown above, the PUC used the terms “useful life” and “depreciation” when discussing meters (including smart meters) and related those terms to the meter’s cost over its useful life. This example taken from the PUC’s 2009 Implementation Order illustrates that the PUC appears to know that “depreciation” is, in fact, an accounting term that relates to an expenditure for exhaustion, wear and tear, and obsolescence

allocated over an asset's useful life. It also shows that the PUC should know that depreciation does not mean and has nothing to do with "mandatory deployment." Rather, depreciation is a result of deployment of an asset.

After showing an understanding of what depreciation means on page 12, it is unclear how only two pages later in the Implementation Order, on page 14, the PA PUC states "The Commission believes that it was the intent of the General Assembly to require all covered EDCs to deploy smart meters systemwide when it included a requirement for smart meter deployment "in accordance with a depreciation schedule not to exceed 15 years." The PUC has consistently ruled that in using the terms "systemwide smart meter deployment," the PUC means that there can be no exception for any homeowner who objects to a smart meter on their property for any reason, including but not limited to adverse medical or health effects. There is simply no basis for this position.

Further, on page 29 of the Implementation Order where recovery of costs of "deployment and installation" of smart meter technology is discussed, the PUC states "these costs would include both capital and expense items relating to all plan elements, equipment and facilities, as well as an analysis of all administrative costs. More specifically, these costs would include, but not be limited to, capital expenditures for any equipment and facilities that may be required to implement the smart meter plan, as well as depreciation, operating and maintenance expenses." Once again, the PUC uses the term "depreciation" correctly as an accounting term as a cost *resulting from* the deployment of smart meters. "Depreciation" is not synonymous with the term "deployment"—rather, the terms are separate and distinct.

The PUC's discussion of the recovery of costs in the paragraph above comes from Section 2807(f)(7) of Act 129 of 2008. Section 2807(f)(7) provides that part of the recoverable costs include annual depreciation and capital costs over the life of smart meter technology. In § 2807(f)(7), depreciation is clearly an expense for the exhaustion, wear and tear, and obsolescence of a smart meter. Based on the PUC's 2009 Implementation Order references to "depreciation" discussed above, the PUC appears to understand the correct meaning and usage of the term. It is not logical that "depreciation" should somehow be defined completely differently by the PUC (and to ascribe legislative intent which was entirely absent from actual wording and legislative discussion just prior to passage of the Act) solely for purposes of Section 2807(f)(2)(iii).

Additional historical clarity can be seen in the words of the PA PUC itself—as recently as December 19, 2019. In its Act 129 Total Resource Cost (TRC) Test for 2021¹¹, on

¹¹ Act 129 discusses the TRC test being a standard test that is met if, over the effective life of each plan not to exceed 15 years, the net present value of the avoided monetary cost of supplying electricity is greater than the net

page 21, the PA PUC discusses effective useful life and stated “While certain technologies may have an expected useful life greater than 15 years, Act 129 is clear about the 15-year limit, and any adjustment to the cost ledger would circumvent the legislative directive.” Here, the PA PUC correlates useful life with cost of a technology—providing additional evidence that the meaning of depreciation is fully understood. Also of note is the repetitive theme of a 15-year useful life seen in the Act.

Section 2807(f)(7) says “an electric distribution company may recover reasonable and prudent costs of providing smart meter technology under paragraph (2)(ii) and (iii),¹² as determined by the commission. This paragraph includes “annual depreciation and capital costs over the life of the smart meter technology and the cost of any system upgrades that the electric distribution company may require to enable the use of smart meter technology.....”

Yet again, the General Assembly correctly applies the term “depreciation” in the context of the Act. Depreciation is clearly a cost allocated to the life of a smart meter. Depreciation means the same thing here as it does in Section 2807(f)(2)(iii). Depreciation means depreciation, not deployment.

Additionally, Section 2807(f)(7) does not require that smart meters must be furnished to every customer without exception in order for EDCs to allocate the cost of new systems enabling the use of smart meters. Section 2807(f)(7) makes no such inference, directly or indirectly.

The PUC appears to understand what depreciation means, and that Act 129 § 2807(f)(2)(iii) imposes a maximum 15-year limit on the service life of smart meters; yet states repeatedly that Act 129 §2807(f)(2)(iii) imposes a mandated deployment of smart meters to all customers of covered EDCs. The PUC is clearly capable of understanding and using the correct interpretation of the words “depreciation schedule,” but not when it is defending its misinterpretation of legislative intent and the its Implementation Order of June 2009.

D. Opt-out legislative proposals attempt to mitigate PUC’s misinterpretation of Act 129 and do not contradict Act 129.

Time and time again in the PUC formal complaint administrative process, ALJ and PUC

present value of the monetary cost of energy efficiency conservation measures. Reference to the TRC is only made here to show the PA PUC’s correlation of cost to the useful life of technology.

¹² Specifically, this is referring to 2807(f)(2)(ii) and (iii).

decisions have been rendered against smart meter complainants and the decisions state that the Act does not allow for opt outs. This fact is not contested as stated. The Act does not provide any legislative opt outs, because it was solely an “opt-in” statute—which, of course, would not provide any opt outs.¹³ It is solely and unequivocally the PUC’s misinterpretation of the legislative intent and meaning of the words “in accordance with a depreciation schedule not to exceed 15 years” that turned the Act into a mandatory no opt-out smart meter deployment law; otherwise, if the PUC had not changed the legislative intent and meaning of the law, there would never have been a need to create an opt out.

The Act does allow small volume EDCs to not furnish smart meters to its customers if that EDC services 100,000 or fewer customers. That is, if a customer is served by a small volume EDC, that EDC does not have to furnish a smart meter to a customer upon the customer’s request for a smart meter or in new construction.

The PUC, DLC, and other utilities have either stated or insinuated that the existence of various smart meter opt-out bills proposed by the PA state legislature proves that the legislative intent of the Act was mandatory systemwide deployment.

This is patently false. The first smart meter opt-out bill was proposed in 2012 by State Rep. Mike Reese (House Bills 2186 and 2188 most recently reintroduced as four bills—House Bills 310, 311, 312, and 313). The initial Bills were introduced approximately three years AFTER the PUC’s 2009 Implementation Order, and only one year after the PUC started to dismiss all smart meter formal complaints filed by Pennsylvania residents. The introduction of smart meter opt-out bills, the most recent being Senate Bill number 791, introduced this session, was prompted by urging of constituents who were denied opt outs and accommodations in formal complaint filings in front of the PUC, and not for any other reason.

It is noteworthy that the first opt-out bill was not introduced until years after the passing of the Act and the PUC’s June 2009 Implementation Order, when the EDCs were starting their smart meter roll outs pursuant to the PUC’s implementation orders, but not before then. Timing is key here and speaks volumes. Timing of the first smart meter opt-out proposal in 2012 establishes the fact that opt-out proposals were a response to the PUC’s flawed Implementation Order and the PUC’s refusal to change its flawed interpretation of the Act, and not because of any wording or plain language in the Act

¹³ The absence of a plainly stated opt-out provision does not preclude a utility customer from declining a meter based on various unsafe conditions (including medical implications and negative health effects) that could be caused or exacerbated by smart meter radiofrequency emissions in accordance with 66 Pa. C.S. § 1501.

itself.

See, for example, the long string of formal complaint cases that the PUC has dismissed on the pleadings starting in 2011, cited by PECO in *Kreider v PECO* PUC Docket No.: C-2015-2469655, *PECO Energy's Petition for Reconsideration of the Commission's September 3, 2015 Order*, citing *Gavin v. PECO*, Docket No. C-2012-2325258 (Final Order entered, Jan. 24, 2012):

In PECO's Interlocutory Petition for Reconsideration in *Kreider*, PECO cited an unbroken string of formal complaint smart meter cases that the PUC had dismissed heretofore without a hearing, because the PUC had determined that Act 129 did not permit any opt outs:

"Indeed, no AMI meter cases have proceeded to a hearing on the right to opt out; each of PECO's cases has been dismissed on preliminary objection. See *Francis v. PECO*, Docket No. C-2014-2451351 (Final Opinion and Ordered entered, August 20, 2015); *Van Schoyck v. PECO*, Docket No. C-2015-2478239 (Initial Decision entered, June 19, 2015); *Larson v. PECO*, Docket No. C-2014-2451754 (Final Opinion and Ordered entered, June 11, 2015); *Antonio Romeo v. PECO Energy*, Docket No. C-2015-2479260 (Initial Decision entered, June 4, 2015); *Gerald H. Smith v. PECO*, Docket No. C-2014-2443198 (Final Opinion and Order entered April 23, 2015); *Vincent Feldman v. PECO*, Docket No. C-2015-2442308 (Initial Decision entered, April 1, 2015); *Margaret Hager, M.D. v. PECO Energy*, C-2014-2444961 (Final Order entered, March 12, 2015); *Ellen Donnelly v. PECO Energy*, Docket No. F-2013-2330663 (Final Order Entered March 18, 2014); *Douglas Evans v. PECO Energy*, Docket No. C-2013-2368477 (Final Order entered, February 6, 2014); *Theresa Gavin v. PECO Energy*, Docket No. C-2012-2325258 (Order entered January 24, 2013); *Jeff Morgan v. PECO Energy*, Docket No. C-2013-2356606 (Final Order entered July 23, 2013); *Thomas McCarey v. PECO Energy*, Docket No. C-2013-2354862 (Final Order entered September 26, 2013); *Renney Thomas v. PECO Energy*, Docket No. C-2012-2336225 (Final Order entered December 31, 2013); *Maria Povacz v. PECO Energy*, Docket No. C-2012-2317176 (Order entered September 28, 2012)."

"Moreover, the Commission has ruled consistently on the right to opt out issue with respect to other EDCs. *Gloria Corbett v. Pennsylvania Power Company*, Docket No. C-2011-2219898 (Final Order entered, May 27, 2011); *Richard Negley v. Metropolitan Edison Company*, Docket No. C-2010-2205305 (Final Order entered, March 3, 2011); *Richard Secrest v.*

West Penn Power Company, Docket No. C-2013-2356667 (Final Order entered, Jun. 11, 2013); *Corbett v. Pennsylvania Power Company*, Docket No. C-2011- 2219898 (Order entered May 27, 2011); *Jones v. Metropolitan Edison Company*, Docket No. C-2011- 2224380 (Order entered June 28, 2011); *Griffin v. Metropolitan Edison Company*, Docket No. C-2012-2300172 (Order entered July 31, 2012); *Brake v. West Penn Power Company*, Docket No. C-2013- 2367308 (Order entered November 14, 2013); *Drake v. Pennsylvania Electric Company*, Docket No. C- 2014-2413771 (Order entered June 12, 2014); *Efaw v West Penn Power Company*, Docket No. C-2014-2413744 (Order entered June 12, 2014); *Sean Loughry v. PPL Electric Utilities Corp.*, Docket No. C- 2014-2445932 (Order entered March 2, 2015).” *Krieder v PECO op cit*, PECO Energy's September 18, 2015 Petition for Reconsideration of the Commission's September 3, 2015 Order fn 4.

Legislators clearly remarked as to the non-mandatory intent of PN 4526, and any subsequent effort by anyone to reach out to the PUC to remark about such intent fell on deaf ears as evidenced by complaint after complaint. As shown by a letter written by PUC counsel dated March 20, 2018, related to docket number C-2018-3000222, the PUC has taken the posture that the only way it would change its implementation order was if there was a ruling from a higher court or the Act was amended. At the same time, In the PA PUC's Public Meeting held April 15, 2010, in discussing the deployment process of smart meters and related timeframes on page 10, it states that the PUC Administrative Law Judge (ALJ) “found that the *Implementation Order* is not a regulation and does not have the full force and effect of law. Instead, it acts as a policy to provide guidelines to EDCs regarding the Commission's expectations about smart meter plans.”

That statement contradicts the need for a ruling from a higher court or an amendment to the Act for the PUC to change its Implementation Order. If its Implementation Order does not have the full force and effect of law, then why would a law (that has been completely misinterpreted by PUC) need to be re-written? Why would a higher court need to make a ruling? The answer is that neither needs to take place. The PUC itself states that its Implementation Order is a policy not having the full force and effect of law, yet it refuses to re-address its erroneous policy in the face of overwhelming evidence (well beyond a preponderance of the evidence) that it has misinterpreted the plain language of the Act, the legislative intent of the Act and the constitutionality of its Implementation Order. The PUC can change its erroneous and illegal policy; and does not need an appellate court or the PA state legislature to do so.

E. Time-of-use rates as prescribed in Act 129 do not require mandatory systemwide deployment of smart meters.

EDCs and the PUC have also argued that because time-of-use rates are a requirement under the Act, there must also be mandatory systemwide deployment of smart meters with no exceptions.

Clearly, that is not the case because EDCs with 100,000 or fewer customers do not need to participate in the smart grid, and customers served by those EDCs may not force their EDC to offer them smart meters or time-of-use rates, either. But more importantly, EDCs with 100,001 or more customers may still have customers who request a smart meter and agree to pay for it, and those EDCs will still be furnishing smart meters in new construction. Therefore, time-of-use rates are being implemented in accordance with the Act 129 to those who request them, and in new construction. Time of use rates, however, do not somehow turn 2807(f)(2)(iii) into a mandatory smart meter deployment for all customers of EDCs with 100,001 or more customers. The language of the law does not support it. Once again, 2807(f)(2)(iii) only means that smart meter technology has a useful life not to exceed 15 years. At least every 15 years, smart meters which have already been deployed must be replaced because the Act requires it, and the PUC and DLC appear to know this.

F. The PUC has the ability to change its own Implementation Order.

In the PA PUC's Public Meeting held April 15, 2010,¹⁴ (the joint petition of DLC and other EDCs), the discussion on page 9 states the following: "In Commission proceedings, the proponent of a rule or order bears the burden of proof. 66 Pa. C.S. § 332(a). To satisfy that burden, the proponent of a rule or order must prove each element of its case by a preponderance of the evidence. *Samuel J. Lansberry, Inc. v. Pa. PUC*, 578 A.2d 600 (Pa. Comwlth. 1990). A preponderance of the evidence is established by presenting evidence that is more convincing, by even the smallest amount, than that presented by the other parties to the case. *Se-Ling Hosiery v. Margulies*, 364 Pa. 45, 70 A.2d 854 (1950). Additionally, the Commission's decision must be supported by substantial evidence in the record. More is required than a mere trace of evidence or a suspicion of the existence of a fact sought to be established. *Norfolk & Western Ry. Co. v. Pa. PUC*, 489 Pa. 109, 413 A.2d 1037 (1980)." In this same document (Docket No. M-2009-2123950), as mentioned above, in discussing the deployment process of smart meters and related timeframes on page 10, it states that the PUC Administrative Law Judge (ALJ) "found that the *Implementation Order* is not a regulation and does not have the full force and effect of law. Instead, it

¹⁴ Docket No. M-2009-2123950

acts as a policy to provide guidelines to EDCs regarding the Commission's expectations about smart meter plans."

The evidence presented herein is overwhelming that Section 2807(f)(2)(iii) establishes a maximum service life of smart meters and nothing further. The legislative intent is clear. "Not mandatory" means no forced deployment over a customer's objections. There is no evidence to support the PUC's position that Section 2807(f)(2)(iii) mandates deployment of smart meters to all customers not covered by Section 2807(f)(2)(i) and (ii). Accordingly, and by a preponderance of the evidence, the PUC should reverse its incorrect interpretation of Section 2807(f)(2)(iii). This reversal does not require ruling from an appellate court or an amendment to the Act, although either would serve to accomplish the same end result based on the PUC's refusal to address the issue.

G. The PUC has financial incentives to stand behind its faulty Implementation Order.

The system for handling smart meter complaints at the very least encourages claims of PUC corruption, as smart meter complainants must argue their cases before the very entity that is responsible for promulgating and enforcing the smart meter implementation orders (which Pennsylvania EDCs universally cite in these cases) for Act 129.

These PUC orders are responsible for increasing EDC gross income and thereby increasing PUC revenue, generating millions of dollars per year of the PUC's annual budget. The PUC, through Act 55, takes a tithe of 3/10 of 1 percent of the total gross income of all electric distribution companies and electric generation companies. The more gross income from each EDC, the more money goes to the PUC. The PUC has much to gain—at PA residents' expense—by acting outside the plain language of the law and legislative intent of Act 129.

The PUC continues to dismiss all smart meter harm complaints even as every other state PUC that has considered the potential harm from smart meters offers opt-outs: As of this writing, at least 40 other states offer opt-outs from smart meters to their residents. See attached smart meter opt-out chart (Exhibit F). Ten PA smart meter cases are already on appeal to the Commonwealth Court.

In Pennsylvania, any attempt to refuse the installation of a smart meter—for any reason—is met with an onslaught of lengthy and dense legal documents by the EDCs, and an onerous process that has been imposed by the very same PUC responsible for safeguarding the well-being of its constituents. And the plain fact of the matter is that it cannot be denied that the PUC wrote the Implementation Order upon which the whole

issue of a mandate rests. Yet the PUC is the primary judicial body when an issue or complaint is brought forward challenging the installation of a smart meter that has not been requested, and that represents a credible threat of harm to the homeowner and his or her family. In other judicial venues where such a conflict of interest is apparent, arrangements are routinely made to change the venue and remove the conflict. The party responsible for creating a policy, rule, condition, or contract cannot in fairness be the same party that adjudicates any challenge of that policy, rule, condition, or contract. This is simple common sense. Justice is supposed to be blind and impartial, not oblivious and one-sided.

Subtle and not-so-subtle forms of duress are being applied to frighten and wear down Complainants so that they capitulate. The EDCs—as DLC has done to Complainant Miranda Grace Edwards most recently in their July 2, 2020, Post-Hearing Brief and Proposed Findings of Fact, Conclusions of Law, and Order on pages 29-31 and 72—raise the specter and threat of "suspension of service" unless acceptance of their "Smart Meter Equipment and Contract" is forthcoming. Complainant has been a lifetime customer and has always met her responsibility to pay her electric bills. The Courts, in deciding actual cases, have been quite clear on matters of duress, that is, any "threat of harm that is made to compel a person to do something against his or her will or judgment." The entire smart meter deployment scheme in Pennsylvania is nothing other than a well-orchestrated de facto form of duress being perpetrated on ill-informed and ill-prepared residents to compel their acceptance.

H. The PUC's interpretation of Act 129 violates the *Statutory Construction Act of 1972*, 1 Pa.C.S. §§1501-1991, and tramples the Article I constitutional rights of customers who resist the installation of smart meters.

Complainant's refusal to consent to the installation of a smart meter on her home is an exercise of her constitutional rights over which neither DLC nor the PUC have been delegated authority. Indeed, the delegation of such authority is beyond the power of the General Assembly as stated in Article I, section 25 of the Pennsylvania Constitution:

§ 25. Reservation of powers in people.

To guard against transgressions of the high powers which we have delegated, we declare that everything in this article is excepted out of the general powers of government and shall forever remain inviolate.

PA. CONST., ART. I, §25.

Article II, section 1 of the Pennsylvania Constitution vests the entire legislative power of the Commonwealth in the General Assembly, but there are some subjects that are even beyond the power of the General Assembly to affect. Administrative agency actions that eviscerate Complainant's right to refuse to consent to the installation of a device that will compromise her safety cannot stand.

PROPOSED FINDINGS OF FACT

1. Complainant Miranda Grace Edwards ("Complainant") resides at 3835 Acorn Street, Pittsburgh, PA 15207.
2. Complainant is a *pro se* complainant and has not retained counsel.
3. Respondent is Duquesne Light Company ("DLC"), an electric distribution company ("EDC") regulated by the Pennsylvania Public Utilities Commission ("PA PUC" or "PUC").
4. Complainant is an electricity customer of DLC receiving residential service at the address above under account number 5241582885.
5. Complainant's home is heated by a gas furnace that does not function without electricity. Without electricity, the house will lack heating during the cold winter months. A lack of heating would cause Complainant to suffer (potentially fatal) physical harm if she remained in her residence. A lack of heating combined with sub-freezing temperatures would cause water pipes to freeze and burst, which in turn would cause severe damage to Complainant's home.
6. Complainant's home is cooled by an air conditioner that does not function without electricity. Without electricity, Complainant's home will lack cooling during the hot summer months. A lack of air conditioning could cause Complainant to suffer physical harm when temperatures become extremely high.
7. Complainant's home contains a gas stove with electronic ignition that does not function safely without electricity. Without electricity, Complainant will be unable to cook food in her residence.
8. Complainant's home contains a refrigerator that does not function without electricity. Without electricity, Complainant will be unable to store perishable

foods in her residence.

9. Complainant's home contains computers that Complainant uses to, among other things, perform her job duties remotely. Without electricity, Complainant will be unable to work from home. Since March 2020, Complainant has worked from home 100% of the time. If DLC terminates Complainant's electricity service, Complainant will be unable to comply with Governor Wolf's order for workers to telecommute where possible. Complainant's inability to work from home will interfere with performing her job in compliance with the state order.
10. DLC seeks to terminate electricity service to Complainant's home as soon as possible.
11. Electricity is a basic utility that is essential for a reasonable quality of life in today's world. As such, Complainant requires uninterrupted (to the extent physically possible) electricity service at her home. If DLC terminates electricity service to Complainant's residence, this action would make it impossible for Complainant to live in her own home.
12. Complainant's account is consistently in good standing. The only reason DLC seeks to shut off Complainant's electricity service is that Complainant will not consent to the installation of a smart meter on her property.
13. DLC sent Complainant a letter dated April 4, 2018, informing Complainant that "in the coming months," DLC would "exchange the existing electric meter" at Complainant's home for "a new, digital model." The letter went on to state (in a section titled "What We Will Do") that DLC would call Complainant at "the following phone number" and listed Complainant's correct mobile phone number.
14. Within a week or so of receiving the initial April 2018 letter, Complainant called DLC's customer service number and explained that she does not consent to the installation of a smart meter. The customer representative was immediately agitated and confrontational. She would not pass the call to a manager.
15. On May 10, 2018, a contractor from Wellington Energy Co. parked in front of Complainant's house. Complainant had no reason to expect him; she had not received a phone call from DLC or anyone else regarding the meter installation (as specified in the April 2018 letter). The contractor arrived at approximately 9:30 a.m.; it was purely by chance that, running late for work, Complainant happened to be home. He would have installed the smart meter against Complainant's

wishes if Complainant had not been there to ask him to refrain from doing so.

16. A day or two later, Complainant received a voicemail from DLC saying that they had been “unable” to reach her meter and asking Complainant to call and reschedule. Within a week, Complainant received a letter from DLC dated May 14, 2018. It was the same letter as the previous one, except DLC had included a “Smart Meter Q&A” sheet. It extolled the virtues of smart meters and downplayed health concerns in a cute infographic showing how little RF a smart meter emits compared to household appliances most people own. The figures for RF exposure given by utilities are time-averaged numbers that hide the smart meter’s sharp spikes and disguise the fairly continuous nature of the pulses—every four to five seconds. The sharp RF spike pattern does not resemble cell phones or Wi-Fi. Both cell phones and Wi-Fi can be strong RF emitters, but people can choose to change how they use these. Growing public awareness of RF exposure has led some to choose a wired internet connection or use a wired phone at home. However, most people are not offered a wired smart meter, and once it’s installed the resident can’t turn it off or move it. Exposure to this source of RF is out of a resident’s control, as is the rate and intensity of the RF radiation. As a matter of fact, it seems to be out of everyone’s control. Some sources say a large percentage of the RF emitted by the smart meters is part of the “mesh network” talking to itself mostly for the purpose of network synchronization rather than measuring or transmitting a resident’s consumption of electricity. The smart meter Q&A sheet Complainant received made no attempt to address Complainant’s privacy and security concerns regarding digital meters.

17. On May 18, 2018, Complainant received a letter from DLC stating they had “made several attempts” to contact Complainant but were “not able to gain safe access to the meter.” It said Complainant must contact them “no later than 6/1/18” to arrange the meter exchange. This form letter excluded the fact that Complainant initiated contact with DLC an attempt to address the issue, but was denied even the opportunity to speak with a manager.

18. On or about June 1, 2018, Complainant initiated the informal complaint process by phone with the PUC against DLC. A PUC representative **actively prevented Complainant from filing an informal complaint, in violation of PA Code §56.92, §56.142, §56.151, and §56.162-§56.166.** From PA Code §56.92:

“A public utility may not mail or deliver a notice of termination if a notice of initial inquiry, dispute, **informal or formal** complaint has been filed and is unresolved and if the subject matter of the dispute forms the grounds for the proposed

termination. A notice mailed or delivered in contravention of this section is void.”
(Emphasis added)

The same day, Complainant sent an email to the address DLC provided in the May 18 letter (Attachment B in Complainant’s original complaint).

19. On June 12, 2018, Complainant received from DLC a three-day shut-off notice threatening to cut off service to her residence on June 15, 2018. The shut-off notice claimed that the reason for the threatened termination was “non-access.”
20. Complainant filed a formal complaint against DLC on June 14, 2020 to enjoin them from shutting off her electricity.
21. Due to the complaint, DLC halted the termination of Complainant’s account and has not shut off electricity to Complainant’s residence.
22. Complainant believes that the Itron SK9AMI7 HW 3.1 OpenWay CENTRON Singlephase Smart Meter, which DLC seeks to forcibly install on her house, emits at least 1,268 pulses of RF and LF radiation per day—but possibly as many as 11,404,800 (132 times per second). And this range excludes the smart grid system of which the meter would be a part. It is important to note that Itron is the manufacturer of the SK9AMI7 HW 3.1 OpenWay CENTRON Singlephase Smart Meter being deployed by DLC. Numerous studies, which Complainant and others have referenced extensively elsewhere, have shown detrimental health effects associated with electromagnetic waves such as those transmitted by smart meters including those used by DLC.
23. Complainant believes, and therefore avers, that the deployment of any wireless device by DLC on her property constitutes unsafe service to her, and would constitute DLC's ongoing creation and perpetuation of an unsafe and unhealthy condition at her home and the surrounding property in violation of Section 1501 of the Public Utility Code.
24. The Public Utility Code and the Commission's regulations require that regulated utilities such as DLC "furnish and maintain adequate, efficient, safe, and reasonable service and facilities." (66 Pa. C.S. § 1501; 52 Pa. Code § 57.194)
25. The Public Utility Code and the Commission's regulations further require that DLC make all "repairs, changes, alterations, substitutions, extensions, and improvements in or to such service and facilities as shall be necessary or proper

for the accommodation, convenience, and safety of its patrons, employees, and the public." (66 Pa. C.S. § 1501; 52 Pa. Code § 57.194)

26. Neither DLC's continued deployment of the current wireless AMR meter nor DLC's deployment of a wireless AMI meter at Complainant's residence is necessary or proper for the accommodation, convenience, and safety of its occupants.
27. Neither DLC's wireless AMI meters nor the mesh network of which they are a part have been proven to be safe for customers' homes and the installation of such devices constitutes unsafe service in violation of Section 1501 of the Public Utility Code.
28. In DLC's deployment of smart meters, no accommodation or consideration is given for any circumstances, conditions, or extenuating factors, including but not limited to age, medical condition, disability, medical implants, relative health, reliance on critical care equipment that may be subject to electronic interference. Further, no accounting is made for and no accommodation is provided for the age and condition of the customer's electrical panel and wiring.
29. The living area of Complainant's home measures 1,356 square feet. The property is too small to accommodate moving the electricity meter away from the house, even if Complainant considered this a reasonable solution and agreed to pay the cost of moving the meter as DLC prescribed.
30. The Itron SK9AMI7 HW 3.1 OpenWay CENTRON Singlephase Smart Meter DLC seeks to forcibly install on Complainant's house has a mechanism that emits an LED flicker which indicates rate of consumption. Mr. Wright from Itron testified that the LED light changes frequency with the amount of energy used. With this feature enabled (and there is no way for a DLC customer to know for sure whether or not it is enabled), any person with harmful intentions and night-vision goggles could watch a target's residence to determine whether the target is currently at home.
31. Itron, maker of the Itron SK9AMI7 HW 3.1 OpenWay CENTRON Singlephase Smart Meter DLC seeks to forcibly install on Complainant's house, excitedly boasts of its ability "to deploy load disaggregation in real time with no special equipment at the customer premise." <https://blogs.itron.com/real-time-load-disaggregation/>

32. Complainant avers that, as she has never requested or agreed to pay for a smart meter, she is in complete compliance with Act 129 as it was written and passed by the General Assembly, as it was intended by the Legislators, and as it was signed by Governor Rendell. There is no sound or rational legal basis that establishes otherwise. Complainant also respectfully suggests that the most reasonable, equitable, and common-sense solution to the errors present in the Implementation Order of June 2009, and the one that is the least costly to the residents of the state of Pennsylvania, is simply for the PUC to revise and correct its Implementation Order.

PROPOSED CONCLUSIONS OF LAW

1. Pennsylvania law requires DLC as an electric utility to provide service that is safe and reasonable. 66 PA C.S. § 1501.
2. The PUC is authorized to enforce section 1501.
3. While Act 129 does not provide for a general opt out from smart meters, nothing in Act 129 requires the installation of a smart meter on a customer's home if such installation would be unsafe or unreasonable.
4. 66 Pa. C.S. § 1501 and Act 129 should be read harmoniously together to permit the PUC to order Pennsylvania utilities to accommodate requests such as those made by many smart meter Complainants throughout Pennsylvania—some of which are supported by their treating physicians—to not have smart meters or other RF-emitting devices installed on their residential properties.
5. Complainant has properly addressed to the PUC her concern that DLC's installation of smart meters on her home violates her right to be free of state-sponsored invasion of her personal bodily integrity under the 14th Amendment of the Federal Constitution and under Article 1, Section 11 of the Constitution of the Commonwealth of Pennsylvania.
6. Reading 66 Pa. C.S. § 1501 and Act 129 harmoniously also avoids a conflict with the 14th Amendment of the Federal Constitution as well as the due process protections in Article 1, Section 11 of the Constitution of the Commonwealth of Pennsylvania.
7. The Commission lacks authority to regulate medical treatment or medicine in any way or to override the recommendations of smart meter complainants' treating

physicians.

8. Complainant has been an excellent long-time (i.e., for decades) customer of DLC. Complainant has always met her obligations and responsibility to pay her electric bills, and is up to date with her utility payments and not delinquent or in arrears. In fact, DLC currently owes Complainant more than \$1,000 for overbilling and this sum is currently credit on Complainant's account.
9. Complainant has never requested or agreed to pay for a smart meter. Furthermore, if DLC cannot establish otherwise, Complainant respectfully requests that the PUC rule that it is a Material Fact that this is the case.

PROPOSED ORDER

For the reasons set forth above, Complainant Miranda Grace Edwards asks the Commission to issue an order in this proceeding that states:

1. That the Commission requires and directs DLC to provide accommodations to her pursuant to 66 Pa. C.S. § 1501; and
2. That such accommodation means that DLC shall provide electrical service to her home (the Service Address) without requiring the installation of any device that:
 - a. Emits radiofrequency electromagnetic energy, or
 - b. Collects or transmits any data without her consent other than the monthly electric usage information required to bill the Service Address; and
3. That such accommodation requires DLC to remove her current AMR meter within 30 days of receiving this Order and replace it with a temporary plate or a meter that is not capable of emitting radiofrequency electromagnetic energy, preferably a mechanical analog meter such as those used in Florida, Arizona, and other states.

Respectfully submitted,

/s/

Miranda Grace Edwards
August 6, 2020

February 14, 2020

VIA PAPER AND ELECTRONIC FILING

Rosemary Chiavetta, Secretary
Pennsylvania Public Utility Commission
Commonwealth Keystone Building
400 North Street, 2nd Floor
Harrisburg, PA 17120

Re: Miranda Grace Edwards v. Duquesne Light Company
Docket No. C-2018-3002741

Dear Secretary Chiavetta:

Attached please find **9 Exhibits** regarding the above-referenced matter in preparation for the scheduled February 27, 2020, hearing. They are as follows:

- Exhibit A: Shutoff notice from Duquesne Light Company (DLC)
- Exhibit B: Letter from DLC to me reserving the “right” to petition the Pennsylvania Public Utilities Commission (PUC) to install a smart meter on my property before my Formal Complaint is resolved
- Exhibit C: Email exchange in which a DLC attorney tells me DLC is unwilling to petition PUC for an accommodation for me (per Exhibit B, DLC is willing to petition PUC for permission to take an action that is against the rules and would harm me)
- Exhibit D: IEQ Indoor Environmental Quality Project Report, Access Board (2006)
- Exhibit E: Department of Labor-Job Accommodation Network in its Accommodation and Compliance Series: Employees with Electrical Sensitivity
- Exhibit F: United States 2018 State Smart Meter Opt-Out Survey with Authorities
- Exhibit G: American Academy of Environmental Medicine, Recommendations regarding Electromagnetic and Radiofrequency Exposures (July 12, 2012)
- Exhibit H: Davis, Devra: Environmental Health Trust Research Letter to Staff at Teton National Park Re: Telecommunications Infrastructure Plan EA (April 10, 2019)
- Exhibit I: Priyanka Bandara, David O. Carpenter, “Planetary electromagnetic pollution: it is time to access its impact”, The Lancet Planetary Health, Volume 2, Issue 12, 2018, Pages e512-e514, ISSN 2542-5196, [doi.org/10.1016/S2542-5196\(18\)30221-3](https://doi.org/10.1016/S2542-5196(18)30221-3)

A copy of this document has been served upon the Respondent’s Counsel, Shane Miller, Esq., in accordance with Commission regulations and as shown in the Certificate of Service.

In addition, I have provided my phone number on a separate page so that it will not be entered into the public record. Please do not share this phone number or use it for any purpose other than contacting me for the hearing on February 27, 2020.

Please feel free to contact me via email if you have any questions.

Sincerely,



M. Grace Edwards
Complainant
msea.mdew@gmail.com

Attachment

Cc: ALJ Watson
Shane Miller, Esquire, Counsel for Duquesne Light Company (via USPS and email) (with attachment)



Duquesne Light Company

Shut-off Notice

AVISO DE SUSPENSION DE SERVICIO

Date 6-12-18

Name GRACE ROSEN MIRANDA

Hours – Monday through Friday

Address 35 ACORN ST

9:00 a.m. to 5:00 p.m.

Pittsburgh PA 15207

Payments by Phone 1-866-526-0815

Account 5241582885

(Payments must then be reported to DLC)

6-15-18 Shut-Off Notice

AVISO DE SUSPENSION DE SERVICIO

Your electric service (may be/has been) shut off for:

- Non-Access
- Irregular Wiring
- Meter Tampering
- Theft of Service
- Unauthorized Service Restoration
- Unauthorized Use of Service
- Redistribution
- Unsafe Condition

On or after 8:00 a.m. on 6-15-18. We may act upon this notice for up to 60 days.

We will not shut off your electric service or will restore your service if you take the actions checked below:

- Allow us to enter your home/business to read, inspect, or change the electric meter.
- Pay a reconnection fee in the amount of \$ _____
- Pay for all un-metered or unauthorized service used.
- Obtain a wiring inspection from the appropriate wiring inspection agency.
- Call us at 1-888-393-7100 to properly apply for service.
- Remove all extension cords that are redistributing the service.
- Other: _____
- Important: Once the above checked condition(s) are met, please contact Duquesne Light at 1-888-393-7100.**

If checked, the medical Emergency Notice on the back page applies in this case.

Let us know if you or anyone currently and normally living in your home is SERIOUSLY ILL or is affected with a medical condition, which will be aggravated by termination of service. WE WILL NOT SHUT OFF YOUR SERVICE provided you:

1. Have your licensed physician or certified nurse practitioner certify by phone or in writing that such an illness exists, that it may be aggravated if your service is shut off and the specific reason for which the electric service is required. An acceptable written certification is needed within 7 days: AND
2. Make arrangements to pay this bill. You must provide us with your household income and occupant information to determine your payment terms while protected under the medical certification.

IMPORTANT TO KNOW

Before we shut off your utility service, please read the notice below. You may be eligible for certain protection from shut off.

Atencion! Este es en mensaje muy importante. Si usted no lo entiende, favor de llama a 1-888-393-7100.

- If you have any questions or need more information, please call us today at 1-888-393-7100. After you talk to us, if you are not satisfied, you may file a complaint with the Public Utility Commission (PUC). The PUC may delay the shut-off if you file a complaint before the shut off date. To contact them, call 1-800-692-7380 or write to: Pennsylvania Public Utility Commission P.O. Box 3265, Harrisburg PA 17105-3265.
- If we shut off your service during the winter months (between Dec. 1 – March 31) we will restore your service within 24 hours of your meeting all requirements/conditions to have service reconnected. Where street digging is required, it may take up to 7 days.
- If your landlord pays your utility bill, you have certain legal protections. Please call us at 1-888-393-7100.
- If you have trouble understanding English or have a disability, please call us at 1-888-393-7100.
- If your service is shut off, you may be required to pay more than the amount listed on the front of this notice to have your service turned back on. You may have to pay any additional bills or fees that have become past due.
- All adult occupants of the premise whose names are on the mortgage, deed, or lease are considered the “customer” and are responsible for payment of this bill.
- If service is shut off, ANY adult occupant who has been living at the premise may have to pay all or portions of this bill to have service restored.
- If your service is shut off, you must contact us after your payment has been made to be sure you’ve met all conditions to have the service turned back on and to arrange access to your premises.
- After all conditions have been met to have the service turned back on, it may take up to seven days to have your service restored. Please contact us to discuss the details.

Exhibit B

TUCKER ARENSBERG
Attorneys

Jeremy V. Farrell
jfarrell@tuckerlaw.com

412.594.3938

P. Shane Miller
smiller@tuckerlaw.com

412.594.5503

November 19, 2018

VIA CERTIFIED MAIL

Miranda Grace Edwards
35 Acorn Street
Pittsburgh, PA 15207

RE: Miranda Grace Edwards v. Duquesne Light Company
Docket No. C-2018-3002741

Dear Ms. Edwards:

I write to advise that Duquesne Light will be visiting your property in the coming days to place a tag on our meter indicating that it is not to be exchanged with a smart meter during the pendency of the formal complaint referenced above.

Please note that this is merely an interim measure intended to prevent an inadvertent meter exchange during the pendency of this legal proceeding. It is not intended to be, and should not be construed as, a permanent avoidance of Duquesne Light's obligation to install smart meters throughout its service territory. Additionally, Duquesne Light reserves the right to petition the Public Utility Commission for permission to exchange our meter with a smart meter during the pendency of your formal complaint (if circumstances warrant) and also to take any necessary actions to respond to emergency conditions.

Once your formal complaint is resolved, Duquesne Light will remove the tag and proceed in accordance with that resolution.

If you have any questions, please feel free to call me.

Sincerely,


Jeremy V. Farrell
P. Shane Miller

TADMS:5061267-1 014657-158498

Exhibit C

From: Miller, Shane

Sent: Tuesday, September 17, 2019 11:50 AM

To: 'M. Grace Edwards' <msea.mdew@gmail.com>

Cc: Farrell, Jeremy <jfarrell@tuckerlaw.com>

Subject: RE: Edwards v. DLC - available for a phone call soon? [TA-TADMS.FID206]

Ms. Edwards:

Thanks for your reply.

Duquesne Light is not willing to unilaterally increase its offer, but we are happy to continue settlement discussions and will consider any counter-offer you propose.

I don't fully understand your second point, but I think you're asking if Duquesne Light can request a waiver from the Commission to prevent the installation of a smart meter at your property. Duquesne Light will not make that request.

Sincerely,

Shane Miller, Esq.

Litigation Associate

1500 One PPG Place

Pittsburgh, PA 15222

Phone: 412.594.5503

E-mail: smiller@tuckerlaw.com

[Bio II Website](#)

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COMMUNICATION IS STRICTLY PROHIBITED. IF YOU HAVE RECEIVED THIS COMMUNICATION IN ERROR, PLEASE NOTIFY US IMMEDIATELY.

From: M. Grace Edwards [<mailto:msea.mdew@gmail.com>]
Sent: Tuesday, September 17, 2019 1:07 AM
To: Miller, Shane <smiller@tuckerlaw.com>
Cc: Farrell, Jeremy <jfarrell@tuckerlaw.com>
Subject: Re: Edwards v. DLC - available for a phone call soon? [TA-TADMS.FID206]

External Email: Use Caution When Opening Attachments or Links.

Mr. Miller,

The offer of \$1,000 is too low to cover any option. In addition, it seems to me that the cost of a hearing and expert testimony would total far more than \$1,000. Would you be willing to increase the offer?

Regarding your statement that "We believe Pennsylvania law requires Duquesne Light to install a smart meter at your property, so we must install one": In your letter of November 19, 2018, you mentioned the DLC's willingness to petition the PUC for permission to install a smart meter while my formal complaint is still pending. Would you consider petitioning the PUC for a waiver while holding off on the installation of a smart meter on my house during the resolution of this matter?

Please let me know what you think.

Sincerely,

Grace

On Wed, Sep 11, 2019 at 2:04 PM Miller, Shane <smiller@tuckerlaw.com> wrote:

Ms. Edwards:

Duquesne Light is willing to offer you a settlement payment of \$1,000. In exchange, the parties would enter into a written settlement and release agreement. It would close your complaint and expressly authorize the Company to install a smart meter at your residence. I would draft the settlement agreement, but you'd have a chance to review it before signing it.

I understand that you want to obtain estimates and research your options, but Duquesne Light cannot agree to postpone your case for four months. Duquesne Light has already informed the PA Public Utility Commission that it will finish installing its smart meters by the end of this year. The case must therefore move forward.

However, if you waive your right to a hearing and agree to submit the case through written briefs to Judge Watson (as I mentioned in my last email), Duquesne Light would agree that the parties can submit their briefs in about four months. During that time period, the parties could continue settlement discussions. If you're interested in this option, I suggest that we hold a brief phone call to discuss the next steps, as it is difficult to work through the details by email.

I look forward to your response on these issues. Please feel free to call me at (412) 594-5503.

Sincerely,

Shane Miller, Esq.

Litigation Associate

1500 One PPG Place

Pittsburgh, PA 15222

Phone: 412.594.5503

E-mail: smiller@tuckerlaw.com

Bio || Website

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From: M. Grace Edwards [<mailto:msea.mdew@gmail.com>]

Sent: Friday, September 6, 2019 8:03 PM

To: Miller, Shane <smiller@tuckerlaw.com>

Subject: Re: Edwards v. DLC - available for a phone call soon? [TA-TADMS.FID206]

External Email: Use Caution When Opening Attachments or Links.

Good Evening Mr. Miller,

Would it be possible for me to review the proposed settlement and get back to you? I would need time to research options and get estimates. As you may have inferred, my schedule is fairly busy--and the holidays will be here before we know it. Considering these and other factors, I propose a four-month window. If you agree, that four months would start upon my receipt of your proposal.

Thank you,

Grace

On Tue, Sep 3, 2019 at 3:34 PM Miller, Shane <smiller@tuckerlaw.com> wrote:

Ms. Edwards:

Thank you for responding. I want to run a few ideas by you while we're waiting for Judge Watson to schedule a hearing. I hope they'll streamline the process for both parties. Please share your thoughts when you get a chance.

First, Duquesne Light remains willing to try to resolve this case. I broached settlement in an email to you on December 17, 2018, but I don't think we ever discussed it. We believe Pennsylvania law requires Duquesne Light to install a smart meter at your property, so we must install one. However, in exchange for dismissing your formal complaint and entering into a mutually-agreeable settlement agreement, the Company is willing to provide you with a reasonable monetary settlement. You can use the settlement funds as you see fit, provided that you do not interfere with Duquesne Light's equipment or block our access to it. Some customers, for example, have used settlement funds to hire a contractor to relocate the meter; others have purchased various shields or filters. It would be up to you.

Second, I want to get your thoughts on submitting written briefs to Judge Watson rather than participating in a hearing. As I reviewed your pleadings recently, it seemed to me that your case boils down to a legal question of statutory interpretation rather than a factual dispute. For example, in your Objection to and Motion to Strike Duquesne Light Company's First Set of Discovery Requests, you stated, "Statutory interpretation is the relevant issue here" and "Ultimately, my issues derive from DLC's and/or the PA PUC's misinterpretation of the governing statute, 66 Pa. C.S. 2807...A simple, honest, and legitimate reading of the statute will settle this issue."

If your view of this case comes down to whether you or Duquesne Light is correctly interpreting Act 129, a more efficient way to resolve that question is through written briefing to Judge Watson rather than conducting a two-day hearing with multiple fact and expert witnesses. Of course, you are entitled to a hearing and Duquesne Light will participate in a hearing if that's what you decide to do. But written briefs are another option.

If you're interested in pursuing either matter mentioned above (settlement or written briefs) but don't want to discuss them directly with us, we can request a prehearing conference with Judge Watson to go over these issues.

If you're interested in scheduling a prehearing conference with Judge Watson, please let me know and I'll prepare the request. I'll also be following up soon in a separate email or letter to discuss some outstanding discovery issues.

Sincerely,

Shane Miller, Esq.

Litigation Associate

1500 One PPG Place

Pittsburgh, PA 15222

Phone: 412.594.5503

E-mail: smiller@tuckerlaw.com

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From: M. Grace Edwards [<mailto:msea.mdew@gmail.com>]
Sent: Thursday, August 29, 2019 4:56 PM
To: Miller, Shane <smiller@tuckerlaw.com>
Subject: Re: Edwards v. DLC - available for a phone call soon?

External Email: Use Caution When Opening Attachments or Links.

Hello Mr. Miller,

Thanks for reaching out. It's difficult for me to take calls during the day because I work full-time in an office. Is it something we could discuss via email? This mode of communication is better for me.

Sincerely,

Grace Edwards

On Wed, Aug 28, 2019 at 12:04 PM Miller, Shane <smiller@tuckerlaw.com> wrote:

Hello Ms. Edwards:

I'm one of the attorneys representing Duquesne Light Company in the case you filed with the Public Utility Commission. I'd like to speak with you about a few matters, but didn't want to call you out of the blue. Are you free for a phone call tomorrow at 3:00 pm or Tuesday at 2:00 pm? Please let me know.

Sincerely,

Shane Miller, Esq.

Litigation Associate

1500 One PPG Place

Pittsburgh, PA 15222

Phone: 412.594.5503

E-mail: smiller@tuckerlaw.com

[Bio II Website](#)

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Exhibit D

IEQ Indoor Environmental Quality

A project of the National Institute of Building Sciences (NIBS) with funding support from The Architectural and Transportation Barriers Compliance Board (Access Board)



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Introduction

The Architectural and Transportation Barriers Compliance Board (Access Board) is an independent federal agency devoted to accessibility for people with disabilities. The Access Board is responsible for developing and maintaining accessibility guidelines to ensure that newly constructed and altered buildings and facilities covered by the Americans with Disabilities Act and the Architectural Barriers Act are accessible to and usable by people with disabilities. In November 1999, the Access Board issued a proposed rule to revise and update its accessibility guidelines. During the public comment period on the proposed rule, the Access Board received approximately 600 comments from individuals with multiple chemical sensitivities (MCS) and electromagnetic sensitivities (EMS). They reported that chemicals released from products and materials used in construction, renovation, and maintenance of buildings, electromagnetic fields, and inadequate ventilation are barriers that deny them access to most buildings.

Americans spend about 90 percent of their time indoors, where concentrations of air pollutants are often much higher than those outside. According to the U.S. EPA Healthy Buildings, Healthy People: A Vision for the 21st Century, www.epa.gov/iaq/hbhp/hbhptoc.html "Known health effects of indoor pollutants include asthma; cancer; developmental defects and delays, including effects on vision, hearing, growth, intelligence, and learning; and effects on the cardiovascular system (heart and lungs). Pollutants found in the indoor environment may also contribute to other health effects, including those of the reproductive and immune systems." (p. 4). The report further notes that "Most chemicals in commercial use have not been tested for possible health effects. (p. 8).

There are a significant number of people who are sensitive to chemicals and electromagnetic fields. Surveys conducted by the California and New Mexico Departments of Health and by medical researchers in North Carolina found 16 to 33 percent of the people interviewed reported that they are unusually sensitive to chemicals, and in the California and New Mexico health departments' surveys 2 percent to 6 percent reported that they have been diagnosed as having multiple chemical sensitivities. C. Miller and N. Ashford, "Multiple Chemical Intolerance and Indoor Air Quality," in *Indoor Air Quality Handbook Chapter 27.8* (McGraw-Hill 2001). Another California Department of Health Services survey has found that 3 percent of the people interviewed reported that they are unusually sensitive to electric appliances or power lines. P. LeVallois, et al., "Prevalence and Risk Factors of Self-Reported Hypersensitivity to Electromagnetic Fields in California," in *California EMF Program, "An Evaluation of the Possible Risks From Electric and Magnetic Fields (EMFs From Power Lines, Internal Wiring, Electrical Occupations and Appliances, Draft 3 for Public Comment, April 2001" Appendix 3* (<http://www.dhs.ca.gov/ehib/emf/RiskEvaluation/riskeval.html>).

Individuals with multiple chemical sensitivities and electromagnetic sensitivities, who submitted written comments and/or attended the public information meetings on the draft final rule, requested that the Access Board include provisions in the final rule to make buildings and facilities accessible for them.

The Board has not included such provisions in their rules, but they have taken the commentary very seriously and acted upon it. As stated in the Background for its Final Rule Americans with Disabilities Act (ADA) Accessibility Guidelines for Buildings and Facilities; Recreation Facilities: <http://www.access-board.gov/recreation/final.htm>

"The Board recognizes that multiple chemical sensitivities and electromagnetic sensitivities may be considered disabilities under the ADA if they so severely impair the neurological, respiratory or other functions of an individual that it substantially limits one or more of the

individual's major life activities. The Board plans to closely examine the needs of this population, and undertake activities that address accessibility issues for these individuals.

The Board plans to develop technical assistance materials on best practices for accommodating individuals with multiple chemical sensitivities and electromagnetic sensitivities. The Board also plans to sponsor a project on indoor environmental quality. In this project, the Board will bring together building owners, architects, building product manufacturers, model code and standard-setting organizations, individuals with multiple chemical sensitivities and electromagnetic sensitivities, and other individuals. This group will examine building design and construction issues that affect the indoor environment, and develop an action plan that can be used to reduce the level of chemicals and electromagnetic fields in the built environment.”

This report and the recommendations included within are a direct outgrowth from that public comment process. The Access Board contracted with the National Institute of Building Sciences (NIBS) to establish this Indoor Environmental Quality Project as a first step in implementing that action plan.

A broad and distinguished Steering Committee was established and met in January 2004 in Bethesda, Maryland, to review the project objectives. Subsequently four task teams (committees) were established to address specific issues in buildings related to Operations & Maintenance, Cleaner Air Rooms, Design and Construction, and Products and Materials. The following reports from these four committees offer recommendations for improving IEQ in buildings. They also list valuable resources and references to allow readers to investigate the pertinent issues in greater depth. The focus of the project was on commercial and public buildings, but many of the issues addressed and recommendations offered are applicable in residential settings.

Many volunteers worked diligently to create the recommendations in this report. These individuals are listed in the separate committee sections of the report, but special thanks go to the committee chairs: respectively Hal Levin, Building Ecology Research Group; Michael Mankin, California Division of the State Architect; Roger Morse, Morse-Zentner Associates; and Brent Kynoch, Kynoch Environmental Management, Inc. Lastly, an enormous debt of gratitude is owed to four amazing individuals who made significant contributions to the work of all four committees: Mary Lamielle, National Center for Environmental Health Strategies; Ann McCampbell, MD, Multiple Chemical Sensitivities Task Force of New Mexico; Susan Molloy, National Coalition for the Chemically Injured; and Toni Temple, Ohio Network for the Chemically Injured.

The overall objectives of this project were to establish a collaborative process among a range of stakeholders to recommend practical, implementable actions to both improve access to buildings for people with MCS and EMS while at the same time raising the bar and improving indoor environmental quality to create healthier buildings for the entire population.

This IEQ project supports and helps achieve the goals of the Healthy Buildings, Healthy People project, which acknowledges that "We will create indoor environments that are healthier for everyone by making indoor environments safer for the most vulnerable among us, especially children." (p.17)

Summary Recommendations

The recommendations in this report are only a first step toward the action plan envisioned by the Access Board.

The NIBS IEQ committee offers several recommendations for further action. It is recommended that a follow-on project organize and convene one, or more, workshops to deliberate the issues and recommendations in this report. It is also recommended that a project be organized to develop a single guidelines document. Such guidelines would be built on refinement and coordination of the recommendations of the Design & Construction and Products & Materials committees in this report. This same, or a separate project, should develop new building code provisions to accelerate the implementation of improved IEQ. Lastly, it is recommended that a project be organized to develop guidelines for the design of an “ideal space” for people with MCS and EMS. The recommended follow-up projects should involve collaborative effort and funding from a range of organizations across the building community; e.g., American Institute of Architects (AIA), Associated General Contractors of America (AGC), Building Owners & Managers Association International (BOMA), American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE), Environmental Protection Agency (EPA), and, of course, the Access Board.

Steering Committee

Nicolas Ashford, Massachusetts Institute of Technology
Kathy Barcus, Clarke Construction Company, Inc.
Marilyn Golden, Disability Rights Education and Defense Fund (DREDF)
Harry Gordon, Burt Hill Kosar and Rittelmann Associates
Mark Jackson, Lennox Industries, Inc.
Brent Kynoch, Kynoch Environmental Management, Inc.
Mary Lamielle, National Center for Environmental Health Strategies
Ann McCampbell, Multiple Chemical Sensitivities Task Force of New Mexico
Claudia Miller, University of Texas Health Sciences Center - San Antonio
Susan Molloy, National Coalition for the Chemically Injured
Roger Morse, Morse Zentner Associates
Larry Perry, Building Owners and Managers Association
Bruce Small, Building Inspections
Toni Temple, Ohio Network for the Chemically Injured
James Wasley, University of Wisconsin-Milwaukee

James Raggio, Access Board
Alexander Shaw, National Institute of Building Sciences

Some cleaning products also contain disinfectants. The U.S. EPA notes that one major concern from a health standpoint is the increased incorporation of antimicrobial agents and fragrances in cleaners and air fresheners marketed to reduce indoor air contamination (1).

Many commonly used disinfectant or sanitizer products contain chlorine, phenol, quaternary ammonium compounds, and isopropyl and other alcohols. These produce hazardous fumes and present access barriers for people with chemical sensitivities.

Electromagnetic Fields

For people who are electromagnetically sensitive, the presence of cell phones and towers, portable telephones, computers, fluorescent lighting, unshielded transformers and wiring, battery re-chargers, wireless devices, security and scanning equipment, microwave ovens, electric ranges and numerous other electrical appliances can make a building inaccessible.

The National Institute for Occupational Safety and Health (NIOSH) notes that scientific studies have raised questions about the possible health effects of EMF's. NIOSH recommends the following measures for those wanting to reduce EMF exposure – informing workers and employers about possible hazards of magnetic fields, increasing workers' distance from EMF sources, using low-EMF designs wherever possible (e.g., for layout of office power supplies), and reducing EMF exposure times (11).

Renovation/Remodeling/Furniture

Many new building materials, such as paints, adhesives, wallboard, carpet, and insulation, as well as upholstered furniture, particleboard cabinets, and other furnishings emit hazardous volatile organic compounds (VOC's), contribute to poor indoor air quality (IAQ) and create significant access barriers for people with asthma and/or chemical sensitivities. These materials often outgas and are problematic for prolonged periods of time.

Smoke & Combustion

Many people with asthma and most people with chemical sensitivities are made sick by exposure to: 1) smoke, such as that from tobacco, fireplaces, candles, incense, and barbeques, and other outdoor fires, 2) vehicle and other engine exhaust, especially exhaust from vehicles using diesel or oxygenated fuel, and 3) combustion appliances burning kerosene, propane, or natural gas (natural gas usually being better tolerated than kerosene or propane). If combustion appliances are used, they should be directly vented to the outdoors. Electrical appliances are preferred by people with chemical sensitivities.

Noise & Vibration

Noise and vibration from HVAC systems, vacuums, pumps, helicopters and other sources can trigger severe symptoms, including seizures, in susceptible individuals.

Synergistic Effects of Indoor Air Pollutants

Indoor air is a "chemical soup" made up of a variety of chemicals emitted by building materials, cleaning products, pesticides, personal care and consumer products, emissions from building equipment and activities, etc. While individual chemicals may be hazardous, combinations of chemicals can be even more hazardous through additive or synergistic effects. Synergistic effects

RECOMMENDED ACTIONS FOR FACILITY MANAGERS AND OPERATIONS & MAINTENANCE STAFF

The O & M Committee identified pesticides (indoors & outdoors), fragrances (especially fragrance-emitting devices/FEDS, air fresheners, and deodorizers), and volatile cleaners (including citrus & pine) as the biggest access barriers for people with chemical sensitivities related to operations and maintenance of a building. Cell phone use was identified as a significant barrier for people with electromagnetic sensitivities.

The Committee developed recommendations for making buildings more accessible for people with chemical and/or electromagnetic sensitivities in the areas of pest control, cleaning & disinfecting, mechanical / HVAC, landscape maintenance, and enclosure maintenance. They are listed in bullet form in the Appendix and summarized in the body of the report below.

In addition, recommendations are given for renovation, remodeling, and furnishings and for adoption of policies on smoking, fragrances, cell phone use, notification of building activities, and vehicle idling.

The Committee recognizes that the list of recommendations is long and that few buildings will be able to implement all of them. The recommendations are the ideal goal towards which to strive. Any steps taken to reduce the levels of the problematic substances or conditions listed above will improve access for people with chemical and/or electromagnetic sensitivities and create a healthier building.

Some of the recommendations will not apply to certain types of buildings or geographic areas. The recommendations are given in sufficient detail to help those who need to address a specific issue. Resources from which to obtain more information or guidance are also provided in the Appendix and at the end of the document in Additional Resources.

Recommendations for Pest Control

Adopt an Integrated Pest Management (IPM) program for building interiors and grounds as described in "Healthy Hospitals, Controlling Pests Without Harmful Pesticides" (17). The Los Angeles Unified School District also has an exemplary plan for an IPM program (18).

IPM is a program of prevention, monitoring, record-keeping, and control that eliminates or drastically reduces the use of pesticides. The focus of IPM is to prevent pest problems by reducing or eliminating sources of pest food, water, and shelter and by maintaining healthy lawns (19) and landscapes.

The first approach in controlling a pest outbreak is to improve sanitation, make structural repairs (such as fixing leaky pipes and caulking cracks), and using physical or mechanical controls such as screens, traps, vacuums, and mechanical weed cutters. Increased sanitation measures include more frequent trash removal, restricting eating to designated areas, securing trash container lids, and steam cleaning trash containers. The IPM approach uses knowledge of a pest's biology, habitat, and needs to time specific interventions to prevent and control pests. A least hazardous chemical is used only when other strategies have failed.

Pesticide use is discouraged in a true IPM program. If pesticides are used indoors or outdoors, however, the following precautions should be taken -- notification of applications (even for "spot" or crack & crevice treatments) should be given through posting of signs (before, during, and after applications) and by other means to building occupants, especially those on a pesticide notification

GENERAL RECOMMENDATIONS

Indoor Air & Environmental Quality Program

The O & M Committee recommends that facilities adopt an Indoor Air & Environmental Quality Program (IAQ/IEQ) to promote practices that prevent or reduce the contamination of indoor air, thereby contributing to a safe, healthy, productive and comfortable environment for building occupants. Benefits of good IAQ/IEQ may include improved health of occupants, decrease in the spread of infectious disease, protection of susceptible populations, increased productivity of occupants, improved relationships/fewer complaints, reduction in potential building closures (due to unhealthful conditions), less deterioration of buildings and equipment, reduced maintenance costs, and decreased liability and risk (22).

An IAQ/IEQ Program should include the maintenance of a log that records building problems and health complaints reported by building occupants.

Policies

The O & M committee recommends the following policies be adopted in commercial and public buildings:

No Smoking Policy

It is recommended that smoking be prohibited inside buildings. Smoking should be restricted to designated outdoor smoking areas that are 100 feet from paths of travel, entryways, operable windows, and air intakes.

Fragrance-Free Policy

It is recommended that a fragrance-free policy include prohibition of fragrance-emitting devices (FEDS) and sprays; use of fragrance-free maintenance, laundry, paper and other products; restrictions on perfume, cologne, and other scented personal care products used by employees, visitors, and other occupants; and prohibitions on use of potpourri and burning incense and scented candles.

An important first step is educating staff and others about the need for and benefits of reducing or eliminating the use of fragranced products.

Resources

No Scents Makes Sense brochure, Lung Association of New Brunswick:
<http://www.nb.lung.ca/pdf/NoScentsMakeSense.pdf>

Guidelines on Wearing Scented Products and We Share the Air posters, University of Waterloo, Ontario, Canada, www.safetyoffice.uwaterloo.ca/hspm/hspmm_intro/safety_manual_index.htm, (under 12. Hygiene).

See “[Steps for Implementing a Scent-free Policy in the Workplace](#)” in Additional Resources.

Cell Phone Use Policy

It is recommended that cell phone use be prohibited in areas of a building when requested by an electromagnetically sensitive individual who needs to work or visit that area. Also, see information on use of a Cleaner Air Symbol in the Designated Cleaner Air Room report.

Notification Policy

It is recommended that facilities adopt a posting and notification policy to notify staff, visitors, and other building occupants of pesticide applications, cleaning and maintenance activities, renovation and construction, and other activities that may produce hazardous fumes or dust.

Vehicle Idling Policy

It is recommended that facilities limit or prohibit idling of vehicles, especially diesel vehicles, near entryways, loading docks, operable windows, and air intakes (23).

Recommendations for Future Actions

1. The O & M Committee recommends that the U.S. Access Board sponsor a meeting with stakeholders, including architects, building owners and managers, government officials, scientists, advocates, sensitive and vulnerable individuals, and others to evaluate the recommendations of this report (Operations & Maintenance). This meeting should provide a forum for increasing awareness of the report, facilitating dialogue among stakeholders, assessing the feasibility of the recommendations, and identifying ways to advance the recommendations.

2. The recommendations on cleaning products and practices in this report are based on information that is currently available. The O & M committee found that much more information and research is needed to better define cleaning products and practices that are effective and that will best protect occupant health. Some of the data gaps or problems the Committee identified are lack of information on labels and Material Safety Data Sheets, lack of information on fragrance ingredients combined with incomplete information on their health effects, and safety questions about citrus- and pine-based cleaning products because, among other things, they react with ozone to produce hazardous byproducts.

We, therefore, recommend that the U.S. Access Board and/or NIBS, in conjunction with U.S. EPA and other stakeholders, sponsor a workshop to examine existing information on cleaning products and practices, identify those products and practices that have the least adverse impact on indoor environmental quality and occupant health (including impacts on sensitive and vulnerable individuals), develop best practices, and determine research needs.

National Institute of Building Sciences (NIBS)
Indoor Environmental Quality (IEQ) Project
Designated Cleaner Air Rooms Committee

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INTRODUCTION AND OVERVIEW

Individuals with multiple chemical and/or electromagnetic sensitivities have identified the availability of designated cleaner air rooms and paths of travel in public and commercial buildings as highly important for improving access. The Designated Cleaner Air Rooms Committee examined the rationale for having Designated Cleaner Air Rooms, the types of

buildings or occupancies that may be appropriate for having such rooms, the minimum criteria for such a designation, and who would benefit from having these rooms.

Promising Practices

In November 2001 the State of California adopted a Cleaner Air Symbol and Conditions of Use in its building code to identify areas in publicly funded or leased facilities owned by the State of California that are accessible to and useable by people who are adversely impacted by airborne chemicals or particulate(s) and/or the use of certain electrical fixtures or devices.(1) The symbol can be used when minimum conditions established in the code are met. Use of the designation is voluntary.

A fact sheet on the California Cleaner Air Symbol and Criteria can be found at:

http://www.documents.dgs.ca.gov/dsa/pubs/cleanerair_factsheet.pdf

See 1117B.5.11 Cleaner air symbol (page 109) of the California Code of Regulations for the code language: (see Appendix A)

www.documents.dgs.ca.gov/dsa/pubs/regulations_02-16-05.pdf

Recommended Actions

The Committee was charged with

- 1) reviewing the California symbol and criteria and investigating where it has been implemented, how it has worked, and what modifications and improvements, if any, are necessary to recommend broader usage;
- 2) developing and promoting a national Cleaner Air Symbol and Conditions of Use as appropriate; and
- 3) defining the scope of guidelines for creating an ideal zone (room and path of travel) hereafter referred to as a Clean Air Room in buildings for people with chemical and/or electromagnetic sensitivities.

During the project, the scope of work was expanded to include a brief discussion of accommodations for people with multiple chemical and/or electromagnetic sensitivities to address the needs of those individuals for whom a Cleaner Air Room would not provide adequate access or for those situations when such a designation would not be possible or feasible. Resources that address access and accommodations for people with multiple chemical and/or electromagnetic sensitivities at work, at school, at public meetings, and in hospitals are included at the end of this report.

Committee Recommendations

- The Committee highly recommends that the Access Board and/or the National Institute of Building Sciences (NIBS) fund or seek funding for FY2006 to develop specifications for designing and constructing a Clean Air Room and Path of Travel, the ideal or model room. This project is a natural outgrowth of the work of the other three committees.
- The Committee proposes a Pilot Project for FY2006 to implement a national Cleaner Air Symbol, as promulgated by the State of California, and Conditions of Use, as modified in the National Cleaner Air Signage, Conditions of Use section below, in

select public and commercial buildings such as independent living centers, disability organizations, schools and other educational institutions, public meeting places, or other business or government entities. The Committee recommends that one or more committee members in conjunction with the Access Board and/or the National Institute of Building Sciences assist in its implementation, track its use, analyze how well it has worked, and determine whether modifications or improvements are necessary prior to recommending promotion nationally. This same group would also examine implementation of the California Signage which is expected to take place during the same time frame.

- The Committee recommends that the Access Board, or a committee created by the Board, identify, review, summarize, and publish best practices for accommodations for people with multiple chemical and/or electromagnetic sensitivities on the website. Such a project was previously proposed by Access Board officials and discussed with members of this Committee but was not part of the charge of the current project.

NATIONAL CLEANER AIR SIGNAGE

Background:

In November 2001 the State of California adopted the California Cleaner Air Symbol, California Building Code, Title 24, Parts 2 and 12, 1117B.5.11ff., which established a symbol and criteria for conditions of use to identify a room, facility, and paths of travel that are accessible to and useable by people who are adversely impacted by airborne chemicals or particulate(s) and/or the use of electrical fixtures and/or devices. Installation and use of the Cleaner Air Symbol is on a voluntary basis in state buildings. The Committee learned that the Cleaner Air Symbol has yet to be implemented in California although members of our group are aware of individuals in California and in other states who are using the symbol as a means of advocating for or obtaining individual access needs.

The California Cleaner Air Symbol and Conditions of Use were also proposed for adoption at the meeting of the Accredited Standards Committee A117 on Architectural Features and Site Design of Public Buildings and Residential Structures for Persons with Disabilities in December 2001.(2) The Cleaner Air Symbol received a favorable vote. It was later dropped prior to the issuance of the final standard in 2003: International Code Council, American National Standard-Accessible and Useable Buildings and Facilities, ICC/ANSI A117.1-2003. The Cleaner Air Symbol is expected to be reintroduced for consideration during a new standard cycle that will begin shortly. The Standard must be adopted by a state or locality to be enforceable.

The Committee also discussed the identification of state buildings in California that might qualify for the Cleaner Air Symbol either due to a building's unique ability to meet the implementation criteria, or the need to make public meeting rooms accessible for those with chemical and/or electromagnetic sensitivities. Committee members are also aware of the need to encourage residents of California who may need to access state buildings to seek to implement the Cleaner Air Symbol.

Purpose:

To provide voluntary guidelines for a Cleaner Air Symbol that can be used nationally or adapted for state and local use.

Proposed Language:

National Cleaner Air Symbol: The national symbol shall be the standard used to identify a room, facility, and paths of travel that are more accessible to and useable by people who are adversely impacted by airborne pollutants, such as those with chemical sensitivities, asthma, and other respiratory conditions, and/or people who are adversely impacted by electromagnetic fields from electrical fixtures and equipment such as those with electromagnetic sensitivities.

The Symbol will comply with the specifications as described in the California code.

When the Cleaner Air designation symbol is used, the following requirements must be met:

- The symbol and text, "Cleaner Air" is displayed within a minimum 6-inch square;
- The "Cleaner Air" text is located under the symbol, as shown
- The Cleaner Air Symbol is shown as either a negative or positive image.
- The symbol and text are posted in either black and white, or in Federal Blue and white. When blue is used, Federal Blue Color No. 15090, Federal Standard 595B, is used.
- There is at least a 70% color contrast between the backgrounds of the sign and the surface that it is mounted on.

Conditions of Use

The Cleaner Air Symbol may be posted to identify the room and path of travel if there is verification that the room, facility, and path of travel to the room meet all of the Cleaner Air Requirements as indicated below:

- No Smoking
- Fragrance-Free
- Pesticide-Free (Indoors and Outdoors)
- Least Toxic/Risk Cleaning Products
- No Recent Construction or Remodeling Including Carpet Installation
- Cell phones turned off
- Ability to turn off or unplug computers and other electrical equipment by occupant or staff
- Ability to turn off fluorescent lighting by occupant or staff
- Ability to adjust temperature and air flow by occupant or staff, or the availability of operable window(s)

Paths of Travel

Every effort should be made to make the Paths of Travel as accessible as possible for those with multiple chemical and/or electromagnetic sensitivities even though the paths of travel might not meet all of the criteria of the Cleaner Air Room. It is important that the Path of Travel from the building entrance to the Cleaner Air Room be as short as possible. The building entrance should also be fully accessible to those with mobility and other impairments.

Restrooms

If possible, restrooms that are already fully accessible to those with mobility and other impairments should be designated for use by those individuals using the Cleaner Air Room. These restrooms should be located along the path of travel or as close as possible to the Cleaner Air Room. The restrooms should meet as many of the criteria as possible. The restrooms should prohibit smoking and be free of perfumes, fragranced products, air fresheners, deodorizers, and pesticides. Cleaning should be done with the same least toxic products used in the Cleaner Air Room. Cell phones should be turned off along the path of travel and in the restrooms.

In the event of a chemical pesticide application made to the building or grounds, other than a least hazardous pesticide such as those listed above, remove the sign and consult with those who use the space and others regarding the length of time that the room would need to be closed to protect affected populations based on the product(s) used. (See Operations and Maintenance for least hazardous pest management materials and cautions in the event that a chemical pesticide application is considered for use in the Cleaner Air Room, Path of Travel, Restrooms, or the building or grounds.)

Least Toxic/Risk Cleaning Products:

Avoid or limit the use of products containing chlorine, ammonia, quaternary ammonium, phenol, isopropyl and other alcohols, formaldehyde, and other petroleum distillates. Do not use fragranced, citrus-and/or pine-based cleaning products as mentioned above. Consult those who plan to use the Cleaner Air Room and Path of Travel for cleaning product recommendations. Follow the recommendations of Operations and Maintenance Report for best practices.

No Recent Construction or Remodeling Including Carpet Installation:

Every effort should be made to avoid remodeling activities in the Cleaner Air Room, path of travel, and restrooms. Any remodeling activity would require removal of the signage. The length of time for removal should be determined by the type of activity, extent of the remodeling, and the products and materials selected for use. It is important to choose the least toxic, least problematic products and practices. Except for minimal touch up painting, for example, it would not be unusual to have the signage removal in effect for a period of 3-6 months to a year or more depending on the nature and extent of the remodeling activity. Be sure to consult building occupants with existing health problems and those who are using the Cleaner Air Room for their input and to help determine when the Cleaner Air Room may again be safe for use. (See Products and Materials Report and Design and Construction Report for more information)

Cell Phones Turned Off:

Protect those with electromagnetic sensitivities and others who may be adversely affected by electrical equipment.

Ability to turn off or unplug computers and other electrical equipment by occupant or staff:
Protect those with electromagnetic sensitivities and others who may be adversely affected by computers and electrical equipment.

Ability to turn off fluorescent lighting by occupant or staff:

LEED (Leadership in Energy and Environmental Design) recommendations for new construction call for individual control of lighting.(3) Newer fluorescents that contain electronic rather than magnetic ballasts may be less problematic for some people with electromagnetic sensitivities because they do not produce a visible flicker or audible hum. They are also less prone to trigger seizures.

Ability to adjust temperature and air flow by occupant or staff, or the availability of operable window(s):

LEED recommendations for new construction include individual control of temperature and ventilation.(3) Opening an operable window may improve the air quality or air flow in a Cleaner Air Room and compensate for situations when individual control of temperature and air flow is not possible.

The text below is duplicated on the website

RECOMMENDATIONS FOR ACCOMMODATIONS

People with chemical and/or electromagnetic sensitivities can experience debilitating reactions from exposure to extremely low levels of common chemicals such as pesticides, cleaning products, fragrances, and remodeling activities, and from electromagnetic fields emitted by computers, cell phones, and other electrical equipment.

The severity of sensitivities varies among people with chemical and/or electromagnetic sensitivities. Some people can enter certain buildings with minor accommodations while others may be so severely impacted that they are unable to enter these same spaces without debilitating reactions. Furthermore tolerances to specific exposures can vary greatly from one individual to the next. Meanwhile some exposures, such as the application of certain pesticides or extensive remodeling, for example, may be devastating to all chemically sensitive people and make a building or facility inaccessible for a substantial period of time.

According to the Americans with Disabilities Act (ADA) and other disability laws, public and commercial buildings are required to provide reasonable accommodations for those disabled by chemical and/or electromagnetic sensitivities. These accommodations are best achieved on a case-by-case basis.

Reasonable accommodations for a chemically sensitive and/or electromagnetically sensitive individual can include providing a space or meeting area that addresses one or more of the Cleaner Air criteria, upon request, such as

- Remove fragrance-emitting devices (FEDS)
- Delay or postpone indoor or outdoor pesticide applications, carpet cleaning, or other cleaning or remodeling until after the meeting
- Provide room or meeting area near exterior door or with window(s) that can be opened
- Require cell phones and computers be turned off
- Provide incandescent lighting in lieu of fluorescent lighting
- Provide at least one nonsmoking, fragrance-free person per shift to provide services (e.g. nurse, police officer, security guard, clerk)

For individuals who are unable to use or meet in a building or facility, or who are too severely impacted by chemical and/or electromagnetic exposures to use a designated Cleaner Air Room, accommodations may include:

- Meet an individual at the door or outside to conduct business
- Allow a person to wait outside or in car until appointment
- Provide a means, such as a phone, intercom, bell, or buzzer to summon staff to an outside door for assistance
- Permit business to be conducted by phone, fax, mail, or e-mail rather than in person
- Allow participation in a meeting by speakerphone

End duplicated text

SPECIAL ACKNOWLEDGEMENT: The Committee extends a generous thank you to Sharon Toji, Access Communications, for designing the Cleaner Air Symbol and making it available for public use.

INTRODUCTION

The Building Design & Construction Committee was charged with making recommendations for designing commercial and public buildings that would be more accessible for people with multiple chemical and/or **electromagnetic** sensitivities and provide healthier environments for all occupants.

The Committee found that major access barriers for chemically sensitive individuals are factors that contribute to poor air quality, such as pesticides, new carpets, tobacco smoke, inadequate ventilation, mold, certain building materials, and building activities that generate air pollutants. For electromagnetically sensitive individuals, access barriers include fluorescent lighting, unshielded transformers and wiring, security and scanning equipment and numerous other electrical appliances.

The recommendations that follow, therefore, focus on minimizing or eliminating these barriers through designing

- for pest prevention to reduce the need for or the use of pesticides,
- for preventing moisture and mold growth,
- for optimum ventilation via HVAC systems and operable windows,
- for exhausting air contaminants,
- for minimizing use of carpet and other flooring that emit volatiles, and
- for shielding occupants from electromagnetic fields.

Although many building materials can be problematic for chemically sensitive people, the Committee made minimal suggestions regarding product choices as this was the charge of the Building Products and Materials Committee.

Recommendations for Future Actions

The Committee recommends that the Access Board, NIBS, or other entity create a Design Manual using the outline in this report. This Manual would provide more detailed guidance than is provided here.

The Committee acknowledges that while the scientific evidence may be inconclusive about whether ambient electromagnetic fields pose a substantial health risk to the general population, the presence of EMF is an access barrier for people who are electromagnetically sensitive. Therefore, the Committee recommends that measures be taken to reduce EMF whenever possible in order to increase access for these individuals as well as taking a precautionary approach to protecting the health of all.

- Operable windows are preferred. Being able to open windows is an important access issue for chemically sensitive individuals and can be beneficial for other occupants in certain situations. Operable windows should be detailed to minimize air infiltration.

Design to prevent pest problems. (Appendix 3)

- Use inert pest resistant materials. When treatment of wood is required, treating with disodium octaborate tetrahydrate may be among the safer options.
- Incorporate pest barriers such as termite shields, window screens, and bird screens in construction details. Bird and bat droppings pose great IAQ risks.
- Some pesticides such as boric acid are considered environmentally safe. If used, granular or gel forms are preferred. Care should be taken to ensure that particles do not infiltrate interior habitable space.

Shield occupants from external sources of EMF. Windows with low e glazing, metal roof, and siding components may reduce certain interior EMF. (Reference 2)

Roof Design

- Pitched roofs are preferred, because they shed water quickly, clean the roof of pollutants and potential toxins, and are less prone to leakage.
- Inert roofing materials, such as coated metal or clay tile, are ideal. Note that galvanized metal presents a rust hazard and should be avoided.
- Flat roofs are not preferred. If used, membrane and high albedo (highly reflective to heat) type are recommended. Asphalt or modified bitumen built-up roofs are less preferable. (Reference 3)

Wall Design

- Use best design practices to prevent moisture and condensation within walls. Calculate dew points for each exterior wall (and roof) type to verify performance at each condition. Provide detail for all flashing and counter-flashing locations.

Foundation Design

- Provide under-slab vapor barriers, insulation, and damp-proofing to prevent moisture infiltration and condensation.

Protect stored building materials from water damage and mold growth.

Avoid use of water-damaged or mold-affected materials.

Plumbing, Mechanical and Electrical Equipment

Properly insulate pipes to prevent condensation, especially within walls.

Use modeling software to determine airflow and to ensure isolation of pollutant sources and adequate ventilation.

Ventilate areas occupied by people with chemical sensitivities with goal of eliminating odors (ideally entire building). These ventilation rates meet or exceed all worldwide standards. (Reference 4)

Provide local control of temperature and airflow (ideally for every occupant). (Reference 5)

Utilize Displacement Air Distribution method to move pollutants away from occupants.

Dedicate building as Smoke-Free. (Reference 6)

Isolate mechanical equipment from occupied areas.

Provide direct exhaust from rooms and areas that have pollutant-generating sources or activities. These include but are not limited to: (see Appendix 5)

- Bathrooms (code requirement).
- Kitchens or office kitchenettes (this is in addition to code-required hoods or stove exhausts).
- Copy and print rooms.
- Computer rooms.

Ductwork

- Avoid insulation inside ductwork. Use external insulation wrap of non-friable (airborne particle creating) material.
- Oil coatings used in fabrication of sheet metal stock can affect air quality. Prior to installation, thoroughly clean ductwork with a low VOC product. Use methods that do not leave residue or cause oxidation. (Reference 7)

Prohibit the use of fragrances and disinfectants in air distribution systems.

Maintain relative humidity between 30%-50%.

Locate outside air louvers away from pollutant sources.

Filtration (Reference 8)

- Carbon and HEPA filters are preferred.
- Avoid ozone generating air-purification systems.
- Avoid electrostatic air cleaning due to ozone.

In renovation work, re-evaluate HVAC system performance to ensure that original design standards are met.

Shield occupants from internal EMF. Design electrical systems to minimize EMF. Maximum recommended magnetic field levels of 2.5 milligauss (preferably 1 milligauss in occupied areas) and as low as technically achievable in areas to be occupied by people with sensitivities.

Finishes and Furnishings

Refer to Products and Materials Group report for specific recommendations on materials.

Floor Coverings

- Use inert materials wherever possible, such as, but not limited to:
 - Stone, tile, terra-cotta, brick, ceramic tiles,
 - Terrazzo,

APPENDICES

Appendix 1 - Site Selection: Potential Sources of Pollutants and EMF.

The Committee recognizes that few, if any, building sites are likely to be free of all the pollutant sources listed below. The recommendation is to minimize proximity to as many of these sources as possible in order to maximize outdoor environmental quality and hence indoor environmental quality.

Table A-1 Potential Sources of Pollutants and EMF

General (Air, Soil)	Engine Exhaust	Pesticides	Industrial/Commercial	EMF
Recognized area of poor air quality Smog Smoke (chimney, industrial, etc.) Superfund Sites Brownfields Landfills Hazardous waste sites Compost sites Underground storage tanks Floodplains Wetlands Filled-in wetlands Military bases	Heavy traffic Highways Interstates Diesel exhaust Airports	Agriculture (unless organic) Golf courses Mosquito spraying Parks & Forests Roadside spraying Dairies Chicken & hog farms Other intensive livestock operations	Refineries Mines Chemical plants Cement plants Power plants Manufacturing Logging/Pulp mills Incinerators Sewage treatment plants Gas stations Dry cleaners Other commercial sources that emit air pollutants (See Appendix 5 on Use and Occupancy)	Substations Cell phone towers Radio towers Transponders Transformers High tension lines Electrical distribution lines Radar installations Military bases Airports Electrical Transportation Power-generating dams

Appendix 2 - Roof Gardens

Roof gardens involve a range of potential issues related to moisture penetration and mold growth. Flat roofs are prone to pooling water and leaking. Foot traffic can cause or accelerate deterioration leading to leaking. Roof repair is more difficult under gardens. Plants may attract pests that subsequently encourage pesticide use. Planting soils can create dust. Plants can emit volatile fumes and pollen. Plants can drop leaves and fruit that rot and become moldy. Selected plants should be low allergen plants without strong fragrance (See Exterior Landscaping above). If used, roof gardens should be located away from air intakes, operable windows, and doors. Design should ensure that moisture will not penetrate the roof membrane or cause conditions of standing water.

REFERENCES

Reference 1

ASHRAE Fundamentals Handbook, 2001, 25.19:

<http://www.infiltec.com/inf-larg.htm>

<http://www.argonair.com/pdf/Myth%20About%20Bldg%20Env.pdf>

Reference 2

P. Levallois, et al., "Prevalence and Risk Factors of Self-Reported Hypersensitivity to Electromagnetic Fields in California" and "An Evaluation of the Possible Risks from Electric and Magnetic Fields (EMF) From Power Lines, Internal Wiring, Electrical Occupations and Appliances."

<http://www.dhs.ca.gov/ps/deodc/ehib/emf/RiskEvaluation/Appendix3.pdf>

Case study for EMF control (Research Triangle)

http://www.ncgreenbuilding.org/site/ncg/public/show_project.cfm?project_id=120

"EMF reduction: The team reviewed available literature on EMF and their threat to health and determined that while EMF radiation could be measured, its threat to humans had not yet been proven or disproved. Nevertheless, the team recommended adopting a philosophy of prudent avoidance toward EMF risks and undertook modifications of the building design to reduce occupant exposure. EMF radiation can be mitigated by distance and by shielding. Distance offers maximum protection and is "low-tech," while the costs associated with shielding are high and the results are difficult to measure. Consequently, the design team chose to create "buffer zones" to reduce prolonged exposures in portions of the building that are occupied for long periods of time, such as the laboratories and offices. The largest sources of EMF were identified as the building's transformers, the electrical rooms with their many cables, and the electrical conduit that was routed under the building atria. As a first step circulation and utility spaces were used to maximize the separation between a source and any potential receptors."

Reference 3

Fumes from activities involving the installation and repair of modified bitumen roofs.

<http://environmentalchemistry.com/yogi/chemicals/cn/Asphalt%20fumes.html>

Reference 4

Chapter 59, Indoor Air Quality Handbook CFD (Computational Fluid Dynamics) Method for indoor Air Quality Studies. Qingyan Chen, Leon Glicksman, MIT

JAN *Exhibit E*
Job Accommodation Network
Practical Solutions • Workplace Success

Accommodation and Compliance Series

Accommodation and Compliance Series: Employees with Electrical Sensitivity

Job Accommodation Network
PO Box 6080
Morgantown, WV 26506-6080
(800)526-7234 (V)
(877)781-9403 (TTY)
jan@askjan.org
AskJAN.org



Funded by a contract with the Office of Disability
Employment Policy, U.S. Department of Labor

Preface

The Job Accommodation Network (JAN) is funded by a contract with the Office of Disability Employment Policy, U.S. Department of Labor. JAN makes documents available with the understanding that the information be used solely for educational purposes. The information is not intended to be legal or medical advice. If legal or medical advice is needed, appropriate legal or medical services should be contacted.

JAN does not endorse or recommend any products or services mentioned in this publication. Although every effort is made to update resources, JAN encourages contacting product manufacturers/vendors and service providers directly to ensure that they meet the intended purposes. This guarantees that the most up-to-date information is obtained.

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Updated 12/17/2018.

JAN'S Accommodation and Compliance Series

Introduction

JAN's Accommodation and Compliance Series is designed to help employers determine effective accommodations and comply with Title I of the Americans with Disabilities Act (ADA). Each publication in the series addresses a specific medical condition and provides information about the condition, ADA information, accommodation ideas, and resources for additional information.

The Accommodation and Compliance Series is a starting point in the accommodation process and may not address every situation. Accommodations should be made on a case by case basis, considering each employee's individual limitations and accommodation needs. Employers are encouraged to contact JAN to discuss specific situations in more detail.

For information on assistive technology and other accommodation ideas, visit JAN's Searchable Online Accommodation Resource (SOAR) at <https://askjan.org/soar>.

Information about Electrical Sensitivity

There are people who report a sensitivity to electromagnetic fields. Although it has been difficult for the environmental health and medical communities to define, individuals with electromagnetic sensitivity report various symptoms including but not limited to fatigue, weakness, neurological issues, immunological issues, gastrointestinal issues, increased irritability, lack of ability to think clearly and quickly, sleep disturbance, overall malaise, and anxiety. Despite the medical community's difficulty in defining electromagnetic sensitivity, individuals with the condition may benefit from job accommodations.

Electrical Sensitivity and the Americans with Disabilities Act

The ADA does not contain a list of medical conditions that constitute disabilities. Instead, the ADA has a general definition of disability that each person must meet. A person has a disability if he/she has a physical or mental impairment that substantially limits one or more major life activities, a record of such an impairment, or is regarded as having an impairment. For more information about how to determine whether a person has a disability under the ADA, see [How to Determine Whether a Person Has a Disability under the Americans with Disabilities Act Amendments Act \(ADAAA\)](#).

Accommodating Employees with Electrical Sensitivity

People with electrical/electromagnetic sensitivity may develop some of the limitations discussed below, but seldom develop all of them. Also, the degree of limitation will vary among individuals. Be aware that not all people with Alzheimer's disease will need accommodations to perform their jobs and many others may only need a few accommodations. The following is only a sample of the possibilities available. Numerous other accommodation solutions may exist.

Questions to Consider:

1. What limitations is the employee experiencing?
2. How do these limitations affect the employee and the employee's job performance?
3. What specific job tasks are problematic as a result of these limitations?
4. What accommodations are available to reduce or eliminate these problems? Are all possible resources being used to determine possible accommodations?
5. Has the employee been consulted regarding possible accommodations?
6. Once accommodations are in place, would it be useful to meet with the employee to evaluate the effectiveness of the accommodations and to determine whether additional accommodations are needed?
7. Do supervisory personnel and employees need training?

Accommodation Ideas:

Limitations

Attentiveness/Concentration

- Alternative Lighting
- Applications (apps)
- Apps for Memory
- Behavior Modification Techniques
- Cubicle Doors, Shields, and Shades
- Electronic Organizers
- Environmental Sound Machines / Tinnitus Maskers / White Noise Machines
- Flexible Schedule

- Full Spectrum or Natural Lighting Products
- Job Coaches
- Job Restructuring
- Marginal Functions
- Modified Break Schedule
- Noise Canceling Headsets
- Sound Absorption and Sound Proof Panels
- Task Separation
- Telework, Work from Home, Working Remotely
- Timers and Watches
- Uninterrupted "Off" Work Time
- Verbal Cues
- Wall Calendars and Planners
- Worksite Redesign / Modified Workspace
- Written Instructions

Executive Functioning Deficits

- Apps for Concentration
- Checklists
- Color Coded System
- Cubicle Doors, Shields, and Shades
- Environmental Sound Machines / Tinnitus Maskers / White Noise Machines
- Form Generating Software
- Job Coaches
- Job Restructuring
- Marginal Functions
- Modified Break Schedule
- Noise Canceling Headsets
- Recorded Directives, Messages, Materials
- Sound Absorption and Sound Proof Panels
- Speech Recognition Software

- Timers and Watches
- Wall Calendars and Planners
- Written Instructions

Memory Loss

- Additional Training Time / Training Refreshers
- Apps for Memory
- Electronic Organizers
- Memory Software
- Recorded Directives, Messages, Materials
- Reminders
- Support Person
- Verbal Cues
- Wall Calendars and Planners
- Written Instructions

Respiratory Distress/Breathing Problem

- Air Cleaners & Purifiers
- Air Cleaners - Chemical/Odor Removal
- Air Cleaning Systems
- Air Purifiers for Multiple Chemical Sensitivity
- Alternative Cleaning Supplies
- Carpet Alternatives, Sealants, and Sustainable Flooring
- Flexible Schedule
- Floor Cleaning/Stripping Products - Chemical Sensitivity
- Low/No Odor Paints and Stains
- Masks - Smoke Allergy
- Odor/Fragrance/Chemical Masks
- Personal Air Cleaner (Neckworn)
- Powered Air Purifying Respirator (PAPR)
- Respirator Masks
- Telework, Work from Home, Working Remotely

Stress Intolerance

- Apps for Anxiety and Stress
- Behavior Modification Techniques
- Counseling/Therapy
- Environmental Sound Machines / Tinnitus Maskers / White Noise Machines
- Flexible Schedule
- Job Restructuring
- Marginal Functions
- Modified Break Schedule
- Supervisory Methods
- Support Animal
- Support Person

Work-Related Functions

Light

- Alternative Lighting
- Anti-Glare Filters for Fluorescent Lights
- Flexible Schedule
- Fluorescent Light Tube Covers
- Full Spectrum or Natural Lighting Products
- LED Light Filters
- LED Lighting
- Lighting Gel Filters
- Modified Lighting
- Non-Fluorescent Lighting
- Personal Visors
- Telework, Work from Home, Working Remotely

Policies

- Additional Training Time / Training Refreshers
- Aide/Assistant/Attendant

- Flexible Schedule
- Marginal Functions
- Modified Break Schedule
- Periodic Rest Breaks
- Policy Modification
- Reassignment
- Service Animal
- Supervisory Methods
- Support Animal
- Telework, Work from Home, Working Remotely

Situations and Solutions:

A company policy allowing anyone to work from home changed following a merger.

The new company allowed an employee with electrical sensitivity to continue working from home as an accommodation, modifying the new policy and adjusting the way meetings were conducted.

A new hire with electrical sensitivity requested alternative means of communication because the wireless phones triggered symptoms.

The employer provided a wired telephone as an alternative in addition to increasing face-to-face communication.

After moving to a new facility an employee with electrical sensitivity noticed that exposure to devices in the "open concept" office was triggering symptoms.

The employer moved the employees' workspace and allowed the use of a cubicle wall and shielding equipment as an accommodation.

An employee with electrical sensitivity was experiencing increased symptoms during staff meetings.

As an accommodation the employer introduced a policy restricting the use of devices that triggered symptoms during meetings.

An employee with electrical sensitivity was provided with a Plexiglas shield for their computer and phone as an accommodation.

They were also permitted to use a typewriter or handwritten notes in place of the computer for internal communication purposes.

Products

There are numerous products that can be used to accommodate people with limitations. JAN's Searchable Online Accommodation Resource at <https://askjan.org/soar> is designed to let users explore various accommodation options. Many product vendor lists are accessible through this system; however, JAN provides these lists and many more that are not available on the Web site upon request. Contact JAN directly if you have specific accommodation situations, are looking for products, need vendor information, or are seeking a referral.

Resources

Job Accommodation Network

West Virginia University
PO Box 6080
Morgantown, WV 26506-6080
Toll Free: (800) 526-7234
TTY: (304) 293-7186
Fax: (304) 293-5407
jan@askjan.org
<http://AskJAN.org>

The Job Accommodation Network (JAN) is a free consulting service that provides information about job accommodations, the Americans with Disabilities Act (ADA), and the employability of people with disabilities.

Office of Disability Employment Policy

200 Constitution Avenue,
NW, Room S-1303
Washington, DC 20210
Toll Free: (866) 633-7365
odep@dol.gov
<http://dol.gov/odep>

The Office of Disability Employment Policy (ODEP) is an agency within the U.S. Department of Labor. ODEP provides national leadership to increase employment opportunities for adults and youth with disabilities while striving to eliminate barriers to employment.

International Institute for Bau-biologie & Ecology

P.O. Box 8520
Santa Fe, NM 87504-8520
Toll Free: (866) 960-0333
infopod@buildingbiology.net
<http://hbelc.org>

Founded on the Principles of Bau-Biologie® (Building Biology), brought from Germany to North America and the rest of the English-speaking world by the renowned architect Helmut Ziehe, our mission is to help create healthy homes, schools, and workplaces, free of toxins in the indoor air and tapwater, and electromagnetic pollutants.

We guide both the general public and working professionals (architects, builders, engineers, physicians and other health care practitioners, design consultants, etc.) to an understanding of the vital, complex relationship between the natural and built environments, and teach them the means for merging these complementary environments into greater harmony.

This document was developed by the Job Accommodation Network, funded by a contract from the U.S. Department of Labor, Office of Disability Employment Policy (#1605DC-17-C-0038). The opinions expressed herein do not necessarily reflect the position or policy of the U.S. Department of Labor. Nor does mention of tradenames, commercial products, or organizations imply endorsement by the U.S. Department of Labor.

Exhibit F

United States 2018 State Smart Meter Opt-Out Survey with Authorities

This state smart meter opt-out survey is up to date as of August 1, 2018, using information that is publicly available on the internet.

Background:

1. Smart meter opt outs take three general forms:
 - a. State legislation mandating smart meter opt outs.
 - b. State public utility commission regulations mandating smart meter opt outs.
 - c. State public utility commission orders approving opt outs and opt out tariffs for different utilities in their smart meter filings.
2. For several states that are new to smart meter deployment, we were unable to find state mandates, public utility regulations or tariffs regarding opt out filings, so we left those states blank, because we could find no references to smart meter opt out or to mandatory smart meter deployment for residential households.
3. If we were able to find at least one utility in the state which permits smart meter opt outs, we listed that state as a "YES", because obviously, there is at least the possibility of opting out of smart meter deployment in that state.
4. All cited authorities in this survey are compiled and available in full format following this link: <https://www.ehs.group/>

States which have considered smart meter harm	Opt Out?	DATE	Authority
Alabama			
Alaska			
Arizona	YES	12/18/2014	Arizona Corporation Commission Decision No 74871 Docket No E-01345A-13-0069
Arkansas	YES	10/30/2017	Arkansas PSC ORDER 8: DOCKET 16-060-U (Entergy AMI metering application)
California	YES	2/1/2012	CA PSC smart meter opt out order 12-02-014.
Colorado			
Connecticut			
Delaware			
Florida	YES	1/7/2015	Florida PSC order PSC-15-0026-FOF-EI, Docket 130223-EI
Georgia	YES	12/17/2013	<p>“Smart Meter Q & A - Georgia Public Service Commission</p> <p>On December 17, 2013 the Commission approved a Smart Meter Opt-Out tariff as part of Georgia Power's 2013 rate case. Customers who opt out of having a smart meter installed and prefer to maintain a mechanical meter at their residence or facility can now do so with a basic service charge of \$19 per month.”</p> <p>Georgia Public Service Commission Docket # 36989</p>

Hawaii	YES	2013	Kauai Island Utility Cooperatives opt out; August 2017 smart meter opt in only: Hawaiian Electric
		8/29/2017	Maui Hawaiian Electric proposes opt in only
		2/7/2018	Hawaii PUC Order No 35268 Docket 2017-0226
Idaho	YES	2015	Idaho Falls response to CRC opt out recommendations #6.4
Illinois	YES	2/5/2014	Illinois Commerce Comm. Com Ed Opt Out Order 13-0552
Indiana	YES	6/13/2018	Indiana Utility Reg Comm Order Cause 44963
Iowa	YES	pre 2018	Alliant Energy filings with Iowa Utilities Bd allow opt outs from AMI Meters.
Kansas			
Kentucky	YES	4/13/2016	Kentucky PSC Order case 2012-00428
Louisiana	YES	October 2012	Lafayette Utility System smart meter opt out tariff approved by City-Parish Council
Maine	YES	5/19/2011 6/22/2011	Maine PUC Part I Opt Out Order, Opt Out Order.
Maryland	YES	1/7/2013	Maryland Public Service Commission Order No. 85294 Cases no 9207, 9208, 9294
Massachusetts	YES	2014	Massachusetts Dept of Public Utilities tariff 13-83-A
Michigan	YES	6/28/2013	Michigan PSC Decision Case No. U-17087
Minnesota	YES	as of August 2018	Connexus Energy Opt out form

Mississippi	YES	5/17/2017	PSC Order docket 2016-UA-261
Missouri	YES	2018	Missouri City Utilities AMI Opting Out information, City Utilities website 2018
Montana			
Nebraska			
Nevada	YES	2/4/2013	Nevada PUC Docket No. 12-05003
New Hampshire	YES	6/7/2012	NH Cons Stat. Title 34 Ch. 374 section 374-62
New Jersey			
New Mexico	YES	4/11/2018	NM Public Reg Comm. Final Order, Case No. 15-00312-UT
New York	YES	10/19/2017	NY PSC Order Case no 14-M-0196
North Carolina	YES	6/22/2018	North Carolina Utilities Commission Order in Docket No. E-7, SUB 1115; Docket No. E-100, SUB 147; DOCKET No. E-100, SUB 153
North Dakota			
Ohio	YES	4/27/2016	OHIO PUC Order re Duke Energy Opt Out case numbers 14-1160-EL-UNC
Oklahoma	YES	7/1/2018	Okla. Corp Comm. Order No. 679358, Docket No. PUD 201700496
		5/1/2017	Okla. Corp Comm. Order No 662059, Docket No. PUD 201500273

Oregon	YES	3/21/2017	PUC PACIFICORP, d/b/a PACIFIC POWER Order No. 17-113
Pennsylvania	NO	5/3/2018 6/14/2018	PUC final decision C-2015-2474602 PUC final decision C-2015-2475355
Rhode Island	YES	2/1/2013	RI PUC Case No. 2130
South Carolina	YES	11/17/2016	SC PSC DOCKET NO. 2016-354-E - ORDER NO. 2016-791
South Dakota			
Tennessee	YES	August 2012	Cleveland Utilities offers opt outs
Texas	YES	8/9/2013	TEXAS PUC non standard meter service Project 41111 Rule PUC Regulations Section 25.133
Utah	YES	3/7/2017	Provo Municipal Council 17-043 AMI Opt Out Policy and fee request
Vermont	YES	5/18/2012	30 V. Stat. Ann. § 2811
Virginia	YES	5/14/2013	Dominion Energy smart meter opt outs: Dominion Energy website under "Location: Virginia"
Washington	YES	4/10/2018	Wash UTC docket U-180117 Policy Statement
West Virginia	YES	5/14/2013	Dominion Energy smart meter opt outs: Dominion Energy website under "Location: West Virginia"
Wisconsin	YES	11/1/2012	Order docket 5-WI-101 Wisconsin Public Service Commission
Wyoming	YES	12/23/2013	Wyoming PSC Docket No. 10012-59-CT-13 (Record No. 13658)



American Academy of Environmental Medicine

6505 E Central • Ste 296 • Wichita, KS 67206
Tel: (316) 684-5500 • Fax: (316) 684-5709
www.aaemonline.org

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Columbia, MO 65212

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American Academy of Environmental Medicine Recommendations Regarding Electromagnetic and Radiofrequency Exposure

Physicians of the American Academy of Environmental Medicine recognize that patients are being adversely impacted by electromagnetic frequency (EMF) and radiofrequency (RF) fields and are becoming more electromagnetically sensitive.

The AAEM recommends that physicians consider patients' total electromagnetic exposure in their diagnosis and treatment, as well as recognition that electromagnetic and radiofrequency field exposure may be an underlying cause of a patient's disease process.

Based on double-blinded, placebo controlled research in humans,¹ medical conditions and disabilities that would more than likely benefit from avoiding electromagnetic and radiofrequency exposure include, but are not limited to:

- Neurological conditions such as paresthesias, somnolence, cephalgia, dizziness, unconsciousness, depression
- Musculoskeletal effects including pain, muscle tightness, spasm, fibrillation
- Heart disease and vascular effects including arrhythmia, tachycardia, flushing, edema
- Pulmonary conditions including chest tightness, dyspnea, decreased pulmonary function
- Gastrointestinal conditions including nausea, belching
- Ocular (burning)
- Oral (pressure in ears, tooth pain)
- Dermal (itching, burning, pain)
- Autonomic nervous system dysfunction (dysautonomia).

Based on numerous studies showing harmful biological effects from EMF and RF exposure, medical conditions and disabilities that would more than likely benefit from avoiding exposure include, but are not limited to:

- Neurodegenerative diseases (Parkinson's Disease, Alzheimer's Disease, and Amyotrophic Lateral Sclerosis).²⁻⁶
- Neurological conditions (Headaches, depression, sleep disruption, fatigue, dizziness, tremors, autonomic nervous system dysfunction, decreased memory, attention deficit disorder, anxiety, visual disruption).⁷⁻¹⁰
- Fetal abnormalities and pregnancy.^{11,12}
- Genetic defects and cancer.^{2,3,13-19}
- Liver disease and genitourinary disease.^{12,20}

Because Smart Meters produce Radiofrequency emissions, it is recommended that patients with the above conditions and disabilities be accommodated to protect their health. The AAEM recommends: that no Smart Meters be on these patients' homes, that Smart Meters be removed within a reasonable distance of patients' homes depending on the patients' perception and/or symptoms, and that no collection meters be placed near patients' homes depending on patients' perception and/or symptoms.

Submitted by: Amy L. Dean, DO and William J. Rea, MD

Approved July 12, 2012 by the Executive Committee of the American Academy of Environmental Medicine

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Exhibit H

For Express Mail
7100 N Rachel Way
Unit 6 Eagles Rest
Teton Village WY 83025



For U.S. Mail
P.O. Box 58
Teton Village WY 83025
www.ehtrust.org

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<https://documentcloud.adobe.com/link/track?uri=urn:aaid:scds:US:e8826814-1928-45b0-9c18-91f9173689a4>

David Vela, Superintendent
Grand Teton National Park
John D. Rockefeller, Jr. Memorial Parkway

Re: Telecommunications Infrastructure Plan EA

Dear Mr. Vela & National Park Staff,

Environmental Health Trust (EHT) is a nonprofit Think Tank and policy organization dedicated to identifying and reducing environmental health hazards. EHT provides independent scientific research and advice on controllable environmental hazards to local, state and national governments. Today, we write to advise you of scientific grounds for major health and environmental concerns about the proposal for the installation of wireless telecommunications facilities and associated infrastructure at nine developed areas in the park and to express our grave concerns about this planned expansion of mobile communications in Grand Teton National Park. You may recall your discussions last year with me about the need to limit exposures to wildlife and fauna from wireless radiation that took place when we met as part of the City Kids final ascent of the Grand.

We fully recognize there is a need for communication for emergency purposes. We further recognize that the Park plays a unique role in our country and in our lives by providing a wilderness that is apart from the normal hectic life that many Americans lead today. We are deeply concerned that by expanding wireless communications this proposal will irrevocably impair the wilderness experience and that there are wired solutions that would be far less damaging.

The transmissions to and from these proposed microwave wireless installations will be emissions that are an environmental pollutant known to cause cancer (in both experimental animals and humans) and other adverse health and environmental effects (e.g., on birds, bees, trees) according to internationally recognized authoritative research, including studies conducted by the U.S. National Toxicology Program, which is the nation's premiere testing program.

In light of the scientific documentation showing harmful effects, EHT writes today to advise regarding technical scientific information on impacts to human health, wildlife and the environment, explaining why more than 240 expert scientists are calling for immediate reductions in exposures to microwave wireless radiation.

Documented Impacts to Wildlife and the Environment

We would like to make you aware that there is growing literature showing the adverse impacts of microwave radiation on animal and bird behavior and physiology, as well as plants and trees. As the Natural Resources Defense Council and the Public Employees for Environmental Responsibility have argued, an environmental impact

assessment should be performed before building these networks. Peer-reviewed research links EMF emissions to myriad adverse environmental and health effects. Environmental effects include disruptions to reproduction, development, orientation, and migration of animals,¹ and damage to plants and crops.²

Albert Manville, former U.S. Fish and Wildlife Service agency lead on avian-structural impacts, wrote "A BRIEFING MEMORANDUM: What We Know, Can Infer, and Don't Yet Know about Impacts from Thermal and Non-thermal Non-ionizing Radiation to Birds and Other Wildlife"³ documenting the body of research and concluding:

"There is an increasing body of published laboratory research that finds DNA damage at low intensity exposures — well below levels of thermal heating — which may be comparable to far field exposures from cell antennas. This body of work would apply to all species, including migratory birds, since DNA is DNA, whether single-strand or double helix. The first study to find such effects was conducted by H. Lai and N.P. Singh in 1995 (Lai and Singh 1995). Their work has since been replicated (e.g., Lai and Singh 1996, as well as in hundreds of other more recent published studies), performed in at least 14 laboratories worldwide. The take-home message: low level transmission of EMF from cell towers and other sources probably causes DNA damage. The laboratory research findings strongly infer this relationship. Since DNA is the primary building block and genetic "map" for the very growth, production, replication and survival of all living organisms, deleterious effects can be critical."

Please note the following published research studies.

- "A review of the ecological effects of RF-EMF" 2013 review of 113 published studies found in 65% of the studies (50% of the animal studies and about 75% of the plant studies) RF-EMF had a significant effect on birds, insects, other vertebrates, other organisms and plants (Cucurachi 2013). The review paper cites development and reproduction in birds and insects as the most strongly affected endpoints.⁴

¹ See, e.g., Kimmel, Stefan, et al. "Electromagnetic radiation: influences on honeybees (*Apis mellifera*)." *IIAS-InterSymp Conference*, 2007 (finding that 39.7% of the non-irradiated bees had returned to their hives compared to only 7.3% of the irradiated bees); Cucurachi, C., et al. "A review of the ecological effects of radiofrequency electromagnetic fields (RF-EMF)." *Environment International*, vol. 51, 2013, pp. 116–40; "Briefing Paper on the Need for Research into the Cumulative Impacts of Communication Towers on Migratory Birds and Other Wildlife in the United States." *Division of Migratory Bird Management (DMM)*, U.S. Fish & Wildlife Service, 2009; Balmori, A. "Mobile phone mast effects on common frog (*Rana temporaria*) tadpoles." *Electromagnetic Biology and Medicine*, vol. 29, no. 1-2, 2010, pp. 31-5; Harkless, Ryan, Muntather Al-Quraishi and Mary C. Vagula. "Radiation hazards of radio frequency waves on the early embryonic development of Zebrafish." *SPIE Proceedings*, vol. 9112, 2014.

² See, e.g., Waldmann-Selsam, C., et al. "Radiofrequency radiation injures trees around mobile phone base stations." *Science of the Total Environment*, vol. 572, 2016, pp. 554-69; Halgamuge, M.N. "Weak radiofrequency radiation exposure from mobile phone radiation on plants." *Electromagnetic Biology and Medicine*, vol. 36, no. 2, 2017, pp. 213-235; Halgamuge, Malka N., See Kye Yak and Jacob L. Eberhardt. "Reduced growth of soybean seedlings after exposure to weak microwave radiation from GSM 900 mobile phone and base station." *Bioelectromagnetics*, vol. 36, no. 2, 2015, pp. 87-95; Haggerty, Katie. "Adverse Influence of Radio Frequency Background on Trembling Aspen Seedlings." *International Journal of Forestry Research*, vol 2010, no. 836278, 2010.

³ Manville, Albert M. "A BRIEFING MEMORANDUM: What We Know, Can Infer, and Don't Yet Know about Impacts from Thermal and Non-thermal Non-ionizing Radiation to Birds and Other Wildlife." *Wildlife and Habitat Conservation Solutions*, 2014.

⁴ S. Cucurachi, W.L.M. Tamis, M.G. Vijver, W.J.G.M. Peijnenburg, J.F.B. Bolte, G.R. de Snoo, A review of the ecological effects of radiofrequency electromagnetic fields (RF-EMF), *Environment International*, Volume 51, 2013, Pages 116-140, ISSN 0160-4120, doi.org/10.1016/j.envint.2012.10.009.

- A 2012 Review “Impacts of radio-frequency electromagnetic field (RF-EMF) from cell phone towers and wireless devices on biosystem and ecosystem – A Review” on 919 research papers found 593 showed impacts, 180 showed no impacts, and 196 were inconclusive studies.”⁵
- Studies on bees have found behavioral effects (Kumar 2011⁶, Favre 2011⁷), disrupted navigation (Goldsworthy 2009⁸, Sainudeen 2011⁹, Kimmel et al. 2007¹⁰), decreasing egg-laying rate (Sharma and Kumar, 2010¹¹) and reduced colony strength after RF exposures (Sharma and Kumar, 2010, Harst et al. 2006¹²).
- A study focusing on RF from cellular antennas found increased sperm abnormalities in mice exposed to RF from GSM antennas (Otitoloju 2010).¹³
- “Exposure of Insects to Radio-Frequency Electromagnetic Fields from 2 to 120 GHz” published in Scientific Reports is the first study to investigate how insects (including the Western honeybee) absorb the higher frequencies (2 GHz to 120 GHz) to be used in the 4G/5G rollout. The scientific simulations showed increases in absorbed power between 3% to 370% when the insects were exposed to the frequencies. Researchers concluded, “This could lead to changes in insect behavior, physiology, and morphology over time....”¹⁴
- Researchers published a study on frogs in Electromagnetic Biology and Medicine exposing eggs and tadpoles to electromagnetic radiation from cell phone antennas for two months, from the egg phase until an advanced phase of tadpole and found low coordination of movements, an asynchronous growth, resulting in both big and small tadpoles, and a high mortality rate. The authors conclude, “these results indicate that radiation emitted by phone masts in a real situation may affect the development and may cause an increase in mortality of exposed tadpoles.”¹⁵

We also want to bring your attention to the growing body of literature showing the impacts on trees and plants. Here again, experimental literature has found that rhizomes, nitrification and other critical processes to plant growth and health are affected by cell phone like radiation under controlled conditions. There have been over one hundred studies that have shown this and most recently a field study¹⁶ that showed under controlled conditions, trees that are

⁵ S Sivani*, D Sudarsanam, Impacts of radio-frequency electromagnetic field (RF-EMF) from cell phone towers and wireless devices on biosystem and ecosystem – a review, *Biology and Medicine*, 4 (4): 202–216, 2012.

⁶ Kumar, N. R., Sangwan, S., & Badotra, P. (2011). Exposure to cell phone radiations produces biochemical changes in worker honey bees. *Toxicology international*, 18(1), 70–72. doi:10.4103/0971-6580.75869.

⁷ Favre, D. *Apidologie*, Mobile phone-induced honeybee worker piping, (2011) 42: 270. doi.org/10.1007/s13592-011-0016-x.

⁸ Dr. Andrew Goldsworthy, The Birds, the Bees and Electromagnetic Pollution, May 2009.

⁹ Sainudeen Sahib.S, Electromagnetic Radiation (EMR) Clashes with Honey Bees, *International Journal of Environmental Sciences*, Volume 1, No 5, 2011.

¹⁰ Kimmel, Stefan, et. al, Electromagnetic Radiation: Influences on Honeybees (Apis mellifera), 2007.

¹¹ Ved Parkash Sharma, Neelima R. Kumar, Changes in honeybee behaviour and biology under the influence of cellphone radiations, *Current Science*, Vol. 98, No. 10, 25 May 2010.

¹² Wolfgang Harst, Jochen Kuhn, & Hermann Stever, Can Electromagnetic Exposure Cause a Change in Behaviour? Studying Possible Non-Thermal Influences on Honey Bees – An Approach within the Framework of Educational Informatics, 2006.

¹³ Otitoloju, A.A., Obe, I.A., Adewale, O.A. et al., Preliminary study on the induction of sperm head abnormalities in mice, Mus musculus, exposed to radiofrequency radiations from global system for mobile communication base stations. *Bull Environ Contam Toxicol* (2010) 84: 51. doi.org/10.1007/s00128-009-9894-2.

¹⁴ Thielens, A., Bell, D., Mortimore, D. B., Greco, M. K., Martens, L., & Joseph, W. (2018). Exposure of Insects to Radio-Frequency Electromagnetic Fields from 2 to 120 GHz. *Scientific Reports*, 8(1), 3924. <https://doi.org/10.1038/s41598-018-22271-3>.

¹⁵ Balmori A. Mobile phone mast effects on common frog (Rana temporaria) tadpoles: the city turned into a laboratory. *Electromagn Biol Med*. 2010 Jun;29(1-2) 31-35. doi:10.3109/15368371003685363. PMID: 20560769.

¹⁶ Cornelia Waldmann-Selsam, Alfonso Balmori-de la Puente, Helmut Breunig, Alfonso Balmori,

closer to cell phone towers start to die more readily; and this can be seen if one looks at the branches of the trees closest to the antennae of the cell phone tower with the fake tree at the Stilson parking lot off Hwy 390.

Please note these published studies:

- A field monitoring study spanning 9 years involving over 100 trees ([Waldmann-Selsam 2016](#))¹⁷ found trees sustained significantly more damage on the side of the tree facing the antenna, leaving the entire tree system prone to degradation over time. Documentation of tree damage from base stations is made visible in the Report “Tree Damage Caused by Mobile phone base stations” ([Breunig, 2017](#)).¹⁸
- A study on Aspen trees near Lyons, Colorado entitled “[Adverse Influence of Radio Frequency Background on Trembling Aspen Seedlings](#)” published in the *International Journal of Forestry* found adverse effects on growth rate and fall anthocyanin production concluding that, “results of this preliminary experiment indicate that the RF background may be adversely affecting leaf and shoot growth and inhibiting fall production of anthocyanins associated with leaf senescence in trembling aspen seedlings. These effects suggest that exposure to the RF background may be an underlying factor in the recent rapid decline of aspen populations. Further studies are underway to test this hypothesis in a more rigorous way.”¹⁹
- An analysis of 45 peer-reviewed scientific publications (1996-2016) on changes in plants due to the non-thermal RF-EMF effects from mobile phone radiation entitled “[Weak radiofrequency radiation exposure from mobile phone radiation on plants](#) concludes, “Our analysis demonstrates that the data from a substantial amount of the studies on RF-EMFs from mobile phones show physiological and/or morphological effects (89.9%, $p < 0.001$). Additionally, our analysis of the results from these reported studies demonstrates that the maize, roselle, pea, fenugreek, duckweeds, tomato, onions and mungbean plants seem to be very sensitive to RF-EMFs. Our findings also suggest that plants seem to be more responsive to certain frequencies...”²⁰

Electromagnetic Fields Alter Animal and Insect Orientation

Science of the Total Environment published environmental scientist Alforso Balmori’s “[Anthropogenic radiofrequency electromagnetic fields as an emerging threat to wildlife orientation](#),” which states, “Current evidence indicates that exposure at levels that are found in the environment (in urban areas and near base stations) may particularly alter the receptor organs to orient in the magnetic field of the earth. These results could have important implications for migratory birds and insects, especially in urban areas, but could also apply to birds and insects in

[Radiofrequency radiation injures trees around mobile phone base stations](#), *Science of The Total Environment*, Volume 572, 2016, Pages 554-569, ISSN 0048-9697, doi.org/10.1016/j.scitotenv.2016.08.045.

¹⁷ Cornelia Waldmann-Selsam, Alfonso Balmori-de la Puente, Helmut Breunig, Alfonso Balmori, [Radiofrequency radiation injures trees around mobile phone base stations](#), *Science of The Total Environment*, Volume 572, 2016, Pages 554-569, ISSN 0048-9697, doi.org/10.1016/j.scitotenv.2016.08.045.

¹⁸ Breunig, Helmut, [Tree damage caused by mobile phone base stations An observation guide](#), 2017.

¹⁹ Katie Haggerty, “[Adverse Influence of Radio Frequency Background on Trembling Aspen Seedlings: Preliminary Observations](#),” *International Journal of Forestry Research*, vol. 2010, Article ID 836278, 7 pages, 2010. doi.org/10.1155/2010/836278.

²⁰ Malka N. Halgamuge (2017) [Review: Weak radiofrequency radiation exposure from mobile phone radiation on plants](#), *Electromagnetic Biology and Medicine*, 36:2, 213-235, DOI: 10.1080/15368378.2016.1220389.

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natural and protected areas where there are powerful base station emitters of radiofrequencies. Therefore, more research on the effects of electromagnetic radiation in nature is needed to investigate this emerging threat.”²¹

Multiple research studies have documented how animals magnetoreception can be disrupted by external electromagnetic fields from mice²² to cows to dogs to birds.²³ Electromagnetic exposure is especially disruptive to migratory birds.²⁴ Electromagnetic fields have been shown to disrupt the magnetic compass orientation used by birds to navigate.^{25,26} Researchers have suggested this disruption of magnetoreception is due to cryptochrome photoreceptors that allow birds to use built-in receptors as a biological compass.

In 2012 the government of India’s Ministry of the Environment and Forest issued a report on the potential impacts of communication towers on wildlife, citing hundreds of research studies that found adverse effects. Recommendations from the Ministry include, “Introduce a law for protection of urban flora and fauna from emerging threats like ERM/EMF as conservation issues in urban areas are different from forested or wildlife habitats.”²⁷

A 2017 report to UNESCO²⁸ by botanist Mark Broomhall details the association between increasing amounts of electromagnetic radiation from cellular antennas on the Mt. Nardi tower complex and species disappearance and exodus from the Mt. Nardi area of the Nightcap National Park World Heritage Area during a 15-year period (2000-2015). He estimates “in both volume and species that from 70 to 90 % of the wildlife has become rare or has disappeared from the Nightcap National Park within a radius of the Mt. Nardi tower complex. This statement can be summarised with concrete data: 3 bat species once common have become rare or gone, 11 threatened and endangered bird species are gone, 11 migratory bird species are gone, 86 bird species are demonstrating unnatural behaviours, 66 once common bird species are now rare or gone.” The Report concludes, “With these short explanations of events we can appreciate that the effects of this technology and its application on Mt. Nardi over the last fifteen years, affect not only the top of the life chain species but they are devastating the fabric of the continuity of the World Heritage, causing genetic deterioration in an insidious, massive and ever escalating scale. To truly understand what these studies reveal is to stare into the abyss.”

²¹ Alfonso Balmori, Anthropogenic radiofrequency electromagnetic fields as an emerging threat to wildlife orientation, *Science of The Total Environment*, Volumes 518–519, 2015, Pages 58-60, ISSN 0048-9697, doi.org/10.1016/j.scitotenv.2015.02.077.

²² Malkemper, E.P., et al. “Magnetoreception in the wood mouse (Apodemus sylvaticus): influence of weak frequency-modulated radio frequency fields.” *Scientific Reports*, vol. 4, no. 9917, 2015.

²³ Wiltshko Roswitha, Thalau Peter, Gehring Dennis, Nießner Christine, Ritz Thorsten, Wiltshko Wolfgang. Magnetoreception in birds: the effect of radio-frequency fields. 12. *Journal of The Royal Society Interface*.

²⁴ Engels, Svenja, et al. “Anthropogenic electromagnetic noise disrupts magnetic compass orientation in a migratory bird.” *Nature* 509.7500 (2014): 353-356.

²⁵ Wiltshko, Roswitha, et al. “Magnetoreception in birds: the effect of radio-frequency fields.” *Journal of The Royal Society Interface* 12.103 (2015): 20141103.

²⁶ Schwarze, S., et al. “Weak Broadband Electromagnetic Fields are More Disruptive to Magnetic Compass Orientation in a Night-Migratory Songbird (Erithacus rubecula) than Strong Narrow-Band Fields.” *Front Behav Neurosci.* 10.55 (2016).

²⁷ Expert Committee, Ministry of Environment and Forest, Government of India, Report on Possible Impacts of Communication Towers on Wildlife Including Birds and Bees, Constituted on 30th August, 2010.

²⁸ Broomhall, Mark. “Report detailing the exodus of species from the Mt. Nardi area of the Nightcap National Park World Heritage Area during a 15-year period (2000-2015.)” United Nations Scientific and Cultural Organization (2017).

It is very important that in considering antenna placement, there be a full environmental assessment on migratory animal patterns (from the smallest to the largest) and not simply on birds and mammals like the pronghorn but also on impacts to amphibians and insects.

Wireless Radiation is Known to Harm Humans and Wildlife

Human health effects include impaired reproduction, increased incidence of brain cancer, DNA breaks, oxidative stress and immune dysfunction, altered brain development, sleep changes, hyperactivity, and memory and cognitive problems.²⁹ Since the WHO/IARC classified EMF as a Group 2B Possible Carcinogen in 2011, the peer-reviewed research connecting wireless exposure to cancer has significantly strengthened and several scientists have published documentation that the weight of current peer-reviewed evidence supports the conclusion that radiofrequency radiation should be regarded as a human carcinogen.^{30,31,32}

- The 10 year \$30 million National Institute of Environmental Health Sciences National Toxicology Program's (NTP) Studies of the Toxicology and Carcinogenicity of Cell Phone Radiation^{33,34} found that RFR was associated with "clear evidence" of cancer due to the increased malignant schwannomas found in RFR-exposed male rats. The brain (glioma) cancers and tumors in the adrenal glands were also considered evidence of an association with cancer. In addition, exposed animals had significantly more DNA damage, heart damage, and low birth weight.
- The Ramazzini Institute published its findings³⁵ that animals exposed to very low-level RFR developed the same types of cancers as reported by the NTP.
- Long-term research on humans who have used cell phones has found increased tumors—schwannomas and glioblastomas—the same cell type as found in the NTP and Ramazzini Institute studies. Persons who started using cell phones under age 20 had the highest risk.³⁶
- A 2015 Jacobs University study (replicating a 2010 study) found that weak cell phone signals significantly promote the growth of tumors in mice and that combining a toxic chemical exposure with RF more than doubled the tumor response.^{37,38}

²⁹ For more information on acute health symptoms, see, e.g., Martin Pall, Microwave Frequency Electromagnetic Fields (EMFs) Produce Widespread Neuropsychiatric Effects Including Depression, *75 J. Chemical Neuroanatomy* 43-51 (Sept. 2016); Response of residents living in the vicinity of a cellular phone base station in France; Electromagnetic Fields: A Hazard to Your Health2, Healthy Children.

³⁰ Adams, Jessica A., et al. "Effect of mobile telephones on sperm quality: a systematic review and meta-analysis." *Environment International*, 70, 2014, pp. 106-112.

³¹ Deshmukh, P.S., et al. "Cognitive impairment and neurogenotoxic effects in rats exposed to low-intensity microwave radiation." *International Journal of Toxicology*, vol. 34, no. 3, 2015, pp. 284-90.

³² Aldad, T.S., et al. "Fetal Radiofrequency Radiation Exposure From 800-1900 MHz-Rated Cellular Telephones Affects Neurodevelopment and Behavior in Mice." *Scientific Reports*, vol. 2, no. 312, 2012.

³³ National Toxicology Program, Cell Phone Radio Frequency Radiation

³⁴ High exposure to radio frequency radiation associated with cancer in male rats

³⁵ L. Falcioni, L. Bua, E. Tibaldi, M. Lauriola, L. De Angelis, F. Gnudi, D. Mandrioli, M. Manservigi, F. Manservisi, I. Manzoli, I. Menghetti, R. Montella, S. Panzacchi, D. Sgargi, V. Stollo, A. Vornoli, F. Belpoggi, Report of final results regarding brain and heart tumors in Sprague-Dawley rats exposed from prenatal life until natural death to mobile phone radiofrequency field representative of a 1.8 GHz GSM base station environmental emission. *Environmental Research*, Volume 165, 2018, Pages 496-503, ISSN 0013-9351, doi.org/10.1016/j.envres.2018.01.037.

³⁶ [https://www.pathophysiologyjournal.com/article/S0928-4680\(14\)00064-9/fulltext](https://www.pathophysiologyjournal.com/article/S0928-4680(14)00064-9/fulltext)

³⁷ Lerchl, Alexander, et al. "Tumor promotion by exposure to radiofrequency electromagnetic fields below exposure limits for humans." *Biochemical and Biophysical Research Communications*, vol. 459, no. 4, 2015, pp. 585-90.

- “5G wireless telecommunications expansion: Public health and environmental implications,” is a research review published in Environmental Research, which documents the range of adverse effects reported in the published literature from cancer to bacteria growth changes to DNA damage and concludes that “a moratorium on the deployment of 5G is warranted” and “the addition of this added high-frequency 5G radiation to an already complex mix of lower frequencies, will contribute to a negative public health outcome both from both physical and mental health perspectives.”³⁹
- A study published in Electromagnetic Biology and Medicine, “Impact of radiofrequency radiation on DNA damage and antioxidants in peripheral blood lymphocytes of humans residing in the vicinity of mobile phone base station,” compared people living close and far from a cell antennas and found that people living closer to cellular antennas had higher radiation levels in the homes and several significant changes in their blood predictive of cancer development.”⁴⁰
- A 2019 study of students in schools near cell towers found their higher RF exposure was associated with impacts on motor skills, memory and attention (Meo 2019).⁴¹ Examples of other effects linked to cell towers in research studies include neuropsychiatric problems⁴², elevated diabetes⁴³, headaches⁴⁴, sleep problems⁴⁵ and genetic damage⁴⁶. Such research continues to accumulate after the 2010 landmark review study on 56 studies that reported biological effects found at very low intensities, including impacts on reproduction, permeability of the blood-brain barrier, behavior, cellular and metabolic changes, and increases in cancer risk (Lai and Levitt 2010).⁴⁷
- Published research has found impacts from wireless radiation exposure to reproduction and brain development in addition to a myriad of other adverse effects.^{48,49,50,51} Although renowned institutions, such

³⁸ Tillmann, Thomas, et al. "Indication of cocarcinogenic potential of chronic UMTS-modulated radiofrequency exposure in an ethylnitrosourea mouse model." *International Journal of Radiation Biology*, vol. 86, no. 7, 2010, pp. 529-41.

³⁹ <https://doi.org/10.1016/j.envres.2018.01.016>

⁴⁰ Zothansama & Zosangzuali, Mary & Lalramdinpuii, Miriam & Jagetia, Ganesh & Siana, Zothan. (2017). Impact of radiofrequency radiation on DNA damage and antioxidants in peripheral blood lymphocytes of humans residing in the vicinity of mobile phone base stations. *Electromagnetic Biology and Medicine*. 36. 1-11. 10.1080/15368378.2017.1350584.

⁴¹ Meo, S. A., Almahmoud, M., Alsultan, Q., Alotaibi, N., Alnajashi, I., & Hajjar, W. M. (2019). Mobile Phone Base Station Tower Settings Adjacent to School Buildings: Impact on Students' Cognitive Health. *American Journal of Men's Health*. doi.org/10.1177/1557988318816914.

⁴² G. Abdel-Rassoul, O. Abou El-Fateh, M. Abou Salem, A. Michael, F. Farahat, M. El-Batanouny, E. Salem, Neurobehavioral effects among inhabitants around mobile phone base stations, *NeuroToxicology*, Volume 28, Issue 2, 2007, Pages 434-440, ISSN 0161-813X, doi.org/10.1016/j.neuro.2006.07.012.

⁴³ SA, Meo & Alsubaie, Yazeed & Almubarak, Zaid & Almutawa, Hisham & AlQasem, Yazeed & Hasanato, Rana. (2015). Association of Exposure to Radio-Frequency Electromagnetic Field Radiation (RF-EMFR) Generated by Mobile Phone Base Stations with Glycated Hemoglobin (HbA1c) and Risk of Type 2 Diabetes Mellitus. *International Journal of Environmental Research and Public Health*. 12. 14519-14528; 10.3390/ijerph121114519.

⁴⁴ Hutter, H. P., Moshammer, H., Wallner, P., & Kundi, M. (2006). Subjective symptoms, sleeping problems, and cognitive performance in subjects living near mobile phone base stations. *Occupational and environmental medicine*, 63(5), 307-313. doi:10.1136/oem.2005.020784.

⁴⁵ R. Santini, P. Santini, J.M. Danze, P. Le Ruz, M. Seigne, Enquête sur la santé de riverains de stations relais de téléphonie mobile: I/Incidences de la distance et du sexe, *Pathologie Biologie*, Volume 50, Issue 6, 2002, Pages 369-373, ISSN 0369-8114, doi.org/10.1016/S0369-8114(02)00311-5.

⁴⁶ Gursatej Gandhi, Gurpreet Kaur & Uzma Nisar (2015) A cross-sectional case control study on genetic damage in individuals residing in the vicinity of a mobile phone base station, *Electromagnetic Biology and Medicine*, 34:4,344-354, DOI: 10.3109/15368378.2014.933349.

⁴⁷ B. Blake Levitt and Henry Lai, Biological effects from exposure to electromagnetic radiation emitted by cell tower base stations and other antenna arrays, *Environ. Rev.* Downloaded from www.nrcresearchpress.com by 172.58.41.200 on 04/10/19

⁴⁸ Adams, Jessica A., et al. "Effect of mobile telephones on sperm quality: a systematic review and meta-analysis." *Environment International*, 70, 2014, pp. 106-112.

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as the Cleveland Clinic, advise men to keep phones and wireless devices away from their reproductive organs, the public remains largely unaware.

Once the towers are erected they will be upgraded over time with new antennas and soon 5G technology. 5G would use today's wireless frequencies while adding new, higher frequencies to transmit data at faster speeds. These higher frequency millimeter waves uniquely penetrate the eyes and skin,^{52,20,21,22} and have been shown to accelerate bacterial and viral cell growth.⁵³ Millimeter waves were originally developed as a military weapon to create the sensation that the skin is burning.⁵⁴ Currently accepted standards are not sophisticated enough to measure effects on sweat glands or quantify the risks of cumulative exposure.^{55,56} Any future applications of these technologies must consider the biological effect of cumulative exposures to these frequencies.

Radiofrequency radiation exposure is increasing at a rapid pace.

A 2018 article published in *The Lancet Planetary Health* points to unprecedented increasing RF exposures, and the abstract concludes, "due to the exponential increase in the use of wireless personal communication devices (eg, mobile or cordless phones and WiFi or Bluetooth-enabled devices) and the infrastructure facilitating them, levels of exposure to radiofrequency electromagnetic radiation around the 1 GHz frequency band, which is mostly used for modern wireless communications, have increased from extremely low natural levels by about 1018 times..."(Bandara and Carpenter 2018).⁵⁷

Another key finding from Zothansiamia 2017 was that homes closer to antennas had measurably higher radiation levels—adding to the documentation that antennas increase RF levels. An Australian study also found that children in kindergartens with nearby antenna installations had nearly three-and-a-half times higher RF exposures than children with installations further away (more than 300 meters (Bhatt 2016)).⁵⁸

⁴⁹ Deshmukh, P.S., et al. "Cognitive impairment and neurogenotoxic effects in rats exposed to low-intensity microwave radiation." *International Journal of Toxicology*, vol. 34, no. 3, 2015, pp. 284-90.

⁵⁰ Aldad, T.S., et al. "Fetal Radiofrequency Radiation Exposure From 800-1900 MHz-Rated Cellular Telephones Affects Neurodevelopment and Behavior in Mice." *Scientific Reports*, vol. 2, no. 312, 2012.

⁵¹ Sonmez, O.F., et al. "Purkinje cell number decreases in the adult female rat cerebellum following exposure to 900 MHz electromagnetic field." *Brain Research*, vol. 1356, 2010, pp. 95-101.

⁵² A lecture by Paul Ben-Ishai, PhD at the Israel Institute for Advanced Studies on this finding can be found on the 2017 IIAS Conference website. Feldman, Yuri and Paul Ben-Ishai. "Potential Risks to Human Health Originating from Future Sub-MM Communication Systems." *Conference on Wireless and Health*, 2017.

⁵³ Cindy L. Russell, 5G Wireless Telecommunications Expansion: Public Health and Environmental Implications, 165 *Env'tl Res.* 484 (2018).

⁵⁴ For information on Active Denial Systems, see, e.g., Vehicle-Mounted Active Denial System (V-MADS); Active Denial System FAQs.

⁵⁵ A lecture by Paul Ben-Ishai, PhD at the Israel Institute for Advanced Studies on this finding can be found on the 2017 IIAS Conference website. Feldman, Yuri and Paul Ben-Ishai. "Potential Risks to Human Health Originating from Future Sub-MM Communication Systems." *Conference on Wireless and Health*, 2017.

⁵⁶ Hayut, Itai, Paul Ben Ishai, Aharon J. Agranat and Yuri Feldman. "Circular polarization induced by the three-dimensional chiral structure of human sweat ducts." *Physical Review E*, vol. 89, no. 042715, 2014.

⁵⁷ Priyanka Bandara, David O Carpenter, Planetary electromagnetic pollution: it is time to assess its impact, *The Lancet Planetary Health*, Volume 2, Issue 12, 2018, Pages e512-e514, ISSN 2542-5196, doi.org/10.1016/S2542-5196(18)30221-3.

⁵⁸ Bhatt, C. R., Redmayne, M., Billah, B., Abramson, M. J., & Benke, G. (2016). Radiofrequency-electromagnetic field exposures in kindergarten children. *Journal Of Exposure Science And Environmental Epidemiology*, 27, 497. Retrieved from <https://doi.org/10.1038/jes.2016.55>.

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A 2018 multi-country study that measured RF in several countries found that cell phone tower radiation is the dominant contributor to RF exposure in most outdoor areas exposure in urban areas was higher and that exposure has drastically increased. As an example, the measurements the researchers took in Los Angeles, USA was 70 times higher than the US EPA estimate 40 years ago.⁵⁹

FCC limits are non-protective

FCC limits are based only on thermal heating and do not account for biological impacts at levels far lower than FCC limits. The Department of Interior wrote a 2014 letter on the impact of cell towers on migratory birds documenting several studies that found adverse effects and concludes that “The electromagnetic radiation standards used by the Federal Communications Commission (FCC) continue to be based on thermal heating, a criterion now nearly 30 years out of date and inapplicable today.”⁶⁰

In the United States, RFR radiation regulatory limits were set by the FCC more than two decades ago in 1996. However, the FCC limits are not safety standards. Although the EPA was actively researching this issue and tasked to develop proper safety limits,^{61,62} the EPA was abruptly defunded in 1996 and the FCC adopted guidelines developed by industry-connected non-independent groups (ANSI/IEEE C95.1-1992, NCRP’s 1986 Report)⁶³ Experts from U.S. government agencies (including the EPA and NIOSH) have repeatedly documented issues concerning the inadequacy of these limits but their letters have gone unanswered.^{64,65} The EPA has clarified that the FCC limits do not protect against effects from long-term low-level exposures.⁶⁶ In 2008, the National Academy of Sciences released a Report on research needs that included recommending research on the impacts to brain development and exposures to children and pregnant women.⁶⁷

In 2012, the Government Accountability Office issued a Report calling for RFR standards to be updated with current research recommending that the FCC formally reassess the current RF energy exposure limit, including its effects on

⁵⁹ Sanjay Sagar, Seid M. Adem, Benjamin Struchen, Sarah P. Loughran, Michael E. Brunjes, Lisa Arangua, Mohamed Aqiel Dalvie, Rodney J. Croft, Michael Jerrett, Joel M. Moskowitz, Tony Kuo, Martin Rössli, Comparison of radiofrequency electromagnetic field exposure levels in different everyday microenvironments in an international context, Environment International, Volume 114, 2018, Pages 297-306, ISSN 0160-4120, doi.org/10.1016/j.envint.2018.02.036.

⁶⁰ W.R. Taylor, February 7, 2014, United States Department of the Interior, Letter In Reply Refer To: (ER 14/0001) (ER 14/0004).

⁶¹ A lecture by Paul Ben-Ishai, PhD at the Israel Institute for Advanced Studies on this finding can be found on the 2017 IIAS Conference website. Feldman, Yuri and Paul Ben-Ishai. “Potential Risks to Human Health Originating from Future Sub-MM Communication Systems.” *Conference on Wireless and Health*, 2017.

⁶² Hayut, Itai, Paul Ben Ishai, Aharon J. Agranat and Yuri Feldman. “Circular polarization induced by the three-dimensional chiral structure of human sweat ducts.” *Physical Review E*, vol. 89, no. 042715, 2014.

⁶³ <https://www.fcc.gov/general/fcc-policy-human-exposure#block-menu-block-4>

⁶⁴ A lecture by Paul Ben-Ishai, PhD at the Israel Institute for Advanced Studies on this finding can be found on the 2017 IIAS Conference website. Feldman, Yuri and Paul Ben-Ishai. “Potential Risks to Human Health Originating from Future Sub-MM Communication Systems.” *Conference on Wireless and Health*, 2017.

⁶⁵ Hayut, Itai, Paul Ben Ishai, Aharon J. Agranat and Yuri Feldman. “Circular polarization induced by the three-dimensional chiral structure of human sweat ducts.” *Physical Review E*, vol. 89, no. 042715, 2014.

⁶⁶ <https://ehtrust.org/wp-content/uploads/4c0f61dc30c3d6bb27d90f53a57c616e.pdf>

⁶⁷ Consensus Study Report, Identification of Research Needs Relating to Potential Biological or Adverse Health Effects of Wireless Communication Devices, 2008.

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human health, the costs, and benefits associated with keeping the current limit, and the opinions of relevant health and safety agencies, and change the limit if determined appropriate. In response to the [2012 GAO Report](#), the FCC opened proceedings ([ET Docket No. 13-84 Reassessment of FCC Radiofrequency Exposure Limits](#) and [ET Docket No. 03-137 Proposed Changes in the Commission's Rules Regarding Human Exposure to Radiofrequency Electromagnetic Fields](#)) to explore whether it should modify its radiofrequency exposure standards. The FCC also noted, "we specifically seek comment as to whether our current limits are appropriate as they relate to device use by children." To date, the FCC has failed to act. Over 900 comments have been filed since the FCC opened these dockets these dockets, but no US health agency has submitted any opinion or scientific documentation to either docket.

Due to the FCC's inaction, the GAO has [updated](#) the status⁶⁸ as "Closed - Not Implemented" with these comments: "despite many years of consideration, FCC still has no specific plans to take any actions that would satisfy our recommendations. Accordingly, we are closing the recommendations as not implemented."

Children are more vulnerable.

Children's skulls are thinner, their heads are smaller, and the radiation penetrates deeper into their brain. Research has found that a child's head's absorption can be over two times greater, and absorption of the skull's bone marrow can be ten times greater, than adults.^{69,70} The American Academy of Pediatrics, which is the largest organization of U.S. pediatricians, has repeatedly [written](#) to the U.S. government documenting children's vulnerabilities and recommends reducing children's and pregnant women's exposure.⁷¹

The [California Department of Health](#), the [Connecticut Department of Health](#), many international health [organizations](#) and medical associations, and more than 20 [governments](#) are recommending wireless exposure reduction, especially for children.⁷²

Several countries have allowable public exposure limits lower than ICNIRP levels with limits that are even more protective for kindergartens, schools and hospitals. In addition, some governments' regulatory actions include banning cell phones or removing Wi-Fi and cell towers in or near schools.⁷³ For example:

- Belgium and France have banned the sale of cell phones designed for young children and made it illegal to market cell phones to children less than 14 years of age.

⁶⁸ [Exposure and Testing Requirements for Mobile Phones Should Be Reassessed GAO-12-771](#): Published: Jul 24, 2012. Publicly Released: Aug 7, 2012.

⁶⁹ A [lecture](#) by Paul Ben-Ishai, PhD at the Israel Institute for Advanced Studies on this finding can be found on the [2017 IIAS Conference website](#). Feldman, Yuri and Paul Ben-Ishai, "Potential Risks to Human Health Originating from Future Sub-MM Communication Systems." *Conference on Wireless and Health*, 2017.

⁷⁰ Hayut, Itai, Paul Ben Ishai, Aharon J. Agranat and Yuri Feldman. "Circular polarization induced by the three-dimensional chiral structure of human sweat ducts." *Physical Review E*, vol. 89, no. 042715, 2014.

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⁷² For more on international policy actions, see our [online briefing](#). "International Policy Briefing: Cautionary Policy on Radiofrequency Radiation Actions by Governments, Health Authorities and Schools Worldwide." Environmental Health Trust, 2017.

⁷³ See [Database of Worldwide Policies on Cell Phones, Wireless and Health](#), Environmental Health Trust.

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Teton Village WY 83025



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- France has banned cell phones in elementary and middle schools, and playgrounds.⁷⁴
- The Supreme Court of India upheld the High Court of the State of Rajasthan's decision to remove all cell towers from the vicinity of schools, hospitals and playgrounds because this radiation is "hazardous" and causes cancer, brain tumour, digestive disorder and tachycardia.⁷⁵
- The Environment Minister of Italy has decreed to reduce as much as possible indoor exposure to both ELF-EMF and RF-EMF.
- Cyprus has banned Wi-Fi from kindergartens and elementary classrooms.
- In Chile, the 2012 "Antenna Law" prohibits cell antennas/towers in "sensitive areas" such as "educational institutions, nurseries, kindergartens, hospitals, clinics, nursing homes or other institutions of similar nature."⁷⁶

Children will have a lifetime of exposure to wireless radiation; in order to protect their healthy future, public health authorities must limit this exposure as much as possible.

Moreover, recent cell phone radiation tests released by the French government found that nine out of ten cell phones exceed regulatory limits for radiofrequency radiation when tested in body contact positions (simulating a phone in pants pocket, bra or resting on chest). Despite this documentation, U.S. radiation limits have still not been revised. To this date, there has been no public record of an independent systematic review of the research by any U.S. health agency in order to set proper safety standards. The current outdated regulations are inadequate to protect public health.

Since 1997, insurance companies have refused to insure wireless companies and "electromagnetic field exclusions" in insurance policies are an industry standard. EMFs are deemed as "high-risk" in insurance white papers, and EMFs are defined as a "pollutant" by many insurance companies alongside smoke, chemicals, and asbestos. Some companies will only cover liability from EMFs under additional "Pollution Liability" policy enhancement coverage. Some policies not only exclude damages from EMFs but also exclude paying for the defense of "*any supervision, instruction, recommendation, warning or advice given or which should have been given in connection with bodily injury, property damage, abatement and/or mitigation etc.*"

Wireless companies warn their shareholders—in mandated annual 10k filings—that they may incur financial losses from lawsuits related to EMF radiation emissions of their products. For example:

- AT&T states, "*We may incur significant expenses defending such suits or government charges and may be required to pay amounts or otherwise change our operations in ways that could materially adversely affect our operations or financial results.*"
- Crown Castle's 2016 10-K ANNUAL REPORT states, "*If radio frequency emissions from wireless handsets or equipment on our wireless infrastructure are demonstrated to cause negative health effects, potential future claims could adversely affect our operations, costs or revenues. The potential connection between radio frequency emissions and certain negative health effects, including some forms of cancer, has*

⁷⁴ « Plus de téléphones portables dans les écoles et collèges à la rentrée 2018 », annonce Jean-Michel Blanquer, Le Monde (Dec. 10, 2017).

⁷⁵ Abhinav Sharma, Rajasthan HC orders relocation of mobile towers from schools, hospitals, Economic Times (Nov. 28, 2012).

⁷⁶ New communications antenna law in Chile, 20 Communications Law: Newsletter of the International Bar Association Legal Practice Division 14-16 (2013).

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been the subject of substantial study by the scientific community in recent years. We cannot guarantee that claims relating to radio frequency emissions will not arise in the future or that the results of such studies will not be adverse to us...If a connection between radio frequency emissions and possible negative health effects were established, our operations, costs, or revenues may be materially and adversely affected. We currently do not maintain any significant insurance with respect to these matters."

Most wireless companies—from AT&T to Nokia to T Mobile to Verizon Wireless—have issued similar warnings to their shareholders.⁷⁷

Will the visiting public to the National Parks also be warned of the risk?

Scientists Worldwide: Reduce Exposure

An increasing number of experts around the world are calling for reduced exposure—due to the unprecedented threat to public health and the environment—to stop the installation of radiation-emitting equipment placed within meters of homes, playgrounds, and schools.

- In 2015, the International EMF Scientist Appeal, now signed by over 225 scientists from 41 nations, urging the development of more protective guidelines for EMF (including RF-EMF), encouraging precautionary measures, and calling for education of the public about health risks, particularly risks to children and fetal development, was submitted to the Secretary-General of the United Nations, the Director-General of the World Health Organization, and U.N. Member Nations.⁷⁸
- In June 2017, EMF Scientists submitted Comments to the U.S. FCC, asking the FCC to critically consider the potential impact of the 5th generation wireless infrastructure on the health and safety of the U.S. population before proceeding to deploy this infrastructure.
- In September 2017, I joined over 180 experts from 35 countries who sent a declaration to the European Union calling for a moratorium on 5G until hazards have been fully investigated by independent scientists, citing potential neurological impacts, infertility, and cancer.⁷⁹

The tobacco and asbestos crises demonstrate that failing to act on public health hazards when they arise can lead to irreversible damage later. EHT thus strongly opposes building out 5G infrastructure—which would place thousands of new sources of microwave radiation emissions in close proximity to workers, families, and local wildlife—at least until more testing has been conducted.

Cell Towers Create Additional Safety Hazards

Another area of concern with the proposed expansion of the wireless infrastructure is fires. Cell towers are known to catch fire such as the 150-foot tower in Washington that experienced an electrical malfunction at a lighted beacon on top of the tower which caught an Osprey's nest on fire. Many birds, particularly raptors, choose to nest on or near cell towers because of the heat they provide, the clear view, and high vantage point that they favor for their nesting

⁷⁷ Corporate Company Investor Warnings In Annual Reports 10k Filings Cell Phone Radiation Risks

⁷⁸ Blank, M., et al. "International Appeal: Scientists call for protection from non-ionizing electromagnetic field exposure." *European Journal of Oncology*, vol. 20, no. 3/4, 2015, pp. 180-2.

⁷⁹ "Appeal to the European Union: Scientists warn of potential serious health effects of 5G." 13 September 2017.

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sites. There are many more examples of these towers catching fire, such as a 125-foot tower in Maryland. A church in South Africa that housed antennas caught fire this month, and news reports state authorities are investigating if it was a short circuit from the equipment that started the fire.

Towers have also been known to attract lightning strikes. The higher the tower the higher the probability that lightning will strike the tower, presenting another type of fire hazard.⁸⁰

We at the Environmental Health Trust urge you, as stewards of our national parks and along with your mission, “The **National Park Service** preserves unimpaired the **natural** and cultural resources and values of the **national park** system for the enjoyment, education, and inspiration of this and future generations,” to seek out the research and information about the health effects on both humans and the flora and fauna of the parks in order to protect and preserve. Taking all information into consideration you are also following the National Park Service’s own statement, “by caring for the parks and conveying the park ethic, we care for ourselves and act on behalf of the future. The larger purpose of this mission is to build a citizenry that is committed to conserving its heritage and its home on earth.”⁸¹

Respectfully submitted,

A handwritten signature in black ink that reads "Devra Davis".

Devra Davis, PhD, MPH
President, Environmental Health Trust
Fellow, American College of Epidemiology
Visiting Prof. Hebrew Univ. Hadassah Medical Center & Ondokuz Mayıs Univ. Medical School
Associate Editor, Frontiers in Radiation and Health

⁸⁰ Witman, S. (2017), Antenna towers attract additional lightning strikes. *Eos*, 98, doi.org/10.1029/2017EO074341. Published on 26 May 2017.

⁸¹ NPS Entering the 21st Century, Changes in Mission, Changes in the Future, 2016.



Planetary electromagnetic pollution: it is time to assess its impact

As the Planetary Health Alliance moves forward after a productive second annual meeting, a discussion on the rapid global proliferation of artificial electromagnetic fields would now be apt. The most notable is the blanket of radiofrequency electromagnetic radiation, largely microwave radiation generated for wireless communication and surveillance technologies, as mounting scientific evidence suggests that prolonged exposure to radiofrequency electromagnetic radiation has serious biological and health effects. However, public exposure regulations in most countries continue to be based on the guidelines of the International Commission on Non-Ionizing Radiation Protection¹ and Institute of Electrical and Electronics Engineers,² which were established in the 1990s on the belief that only acute thermal effects are hazardous. Prevention of tissue heating by radiofrequency electromagnetic radiation is now proven to be ineffective in preventing biochemical and physiological interference. For example, acute non-thermal exposure has been shown to alter human brain metabolism by NIH scientists,³ electrical activity in the brain,⁴ and systemic immune responses.⁵ Chronic exposure has been associated with increased oxidative stress and DNA damage^{6,7} and cancer risk.⁸ Laboratory studies, including large rodent studies by the US National Toxicology Program⁹ and Ramazzini Institute of Italy,¹⁰ confirm these biological and health effects in vivo. As we address the threats to human health from the changing environmental conditions due to human activity,¹¹ the increasing exposure to artificial electromagnetic radiation needs to be included in this discussion.

Due to the exponential increase in the use of wireless personal communication devices (eg, mobile or cordless phones and WiFi or Bluetooth-enabled devices) and the infrastructure facilitating them, levels of exposure to radiofrequency electromagnetic radiation around the 1 GHz frequency band, which is mostly used for modern wireless communications, have increased from extremely low natural levels by about 10^{18} times (figure). Radiofrequency electromagnetic radiation is also used for radar, security scanners, smart meters, and medical equipment (MRI, diathermy, and radiofrequency ablation). It is plausibly the most rapidly increasing

anthropogenic environmental exposure since the mid-20th century, and levels will surge considerably again, as technologies like the Internet of Things and 5G add millions more radiofrequency transmitters around us.

Unprecedented human exposure to radiofrequency electromagnetic radiation from conception until death has been occurring in the past two decades. Evidence of its effects on the CNS, including altered neurodevelopment¹⁴ and increased risk of some neurodegenerative diseases,¹⁵ is a major concern considering the steady increase in their incidence. Evidence exists for an association between neurodevelopmental or

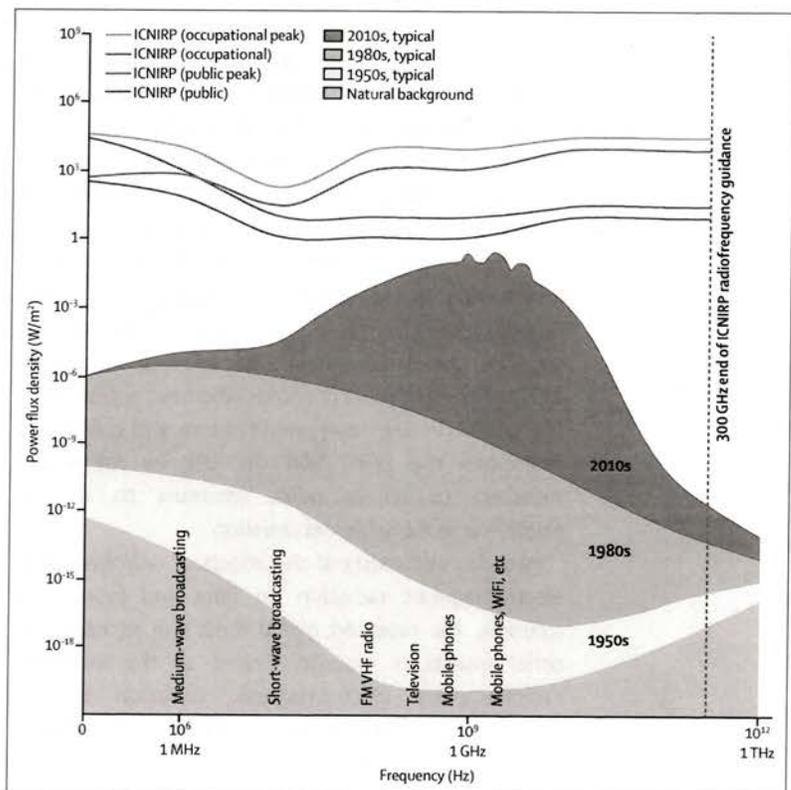


Figure: Typical maximum daily exposure to radiofrequency electromagnetic radiation from man-made and natural power flux densities in comparison with International Commission on Non-Ionizing Radiation Protection safety guidelines¹

Anthropogenic radiofrequency electromagnetic radiation levels are illustrated for different periods in the evolution of wireless communication technologies. These exposure levels are frequently experienced daily by people using various wireless devices. The levels are instantaneous and not time-averaged over 6 minutes as specified by International Commission on Non-Ionizing Radiation Protection for thermal reasons. Figure modified from Philips and Lamburn¹² with permission. Natural levels of radiofrequency electromagnetic radiation were based on the NASA review report CR-166661.¹³

behavioural disorders in children and exposure to wireless devices,¹⁴ and experimental evidence, such as the Yale finding, shows that prenatal exposure could cause structural and functional changes in the brain associated with ADHD-like behaviour.¹⁶ These findings deserve urgent attention.

At the Oceania Radiofrequency Scientific Advisory Association, an independent scientific organisation, volunteering scientists have constructed the world's largest categorised online database of peer-reviewed studies on radiofrequency electromagnetic radiation and other man-made electromagnetic fields of lower frequencies. A recent evaluation of 2266 studies (including in-vitro and in-vivo studies in human, animal, and plant experimental systems and population studies) found that most studies (n=1546, 68.2%) have demonstrated significant biological or health effects associated with exposure to anthropogenic electromagnetic fields. We have published our preliminary data on radiofrequency electromagnetic radiation, which shows that 89% (216 of 242) of experimental studies that investigated oxidative stress endpoints showed significant effects.⁷ This weight of scientific evidence refutes the prominent claim that the deployment of wireless technologies poses no health risks at the currently permitted non-thermal radiofrequency exposure levels. Instead, the evidence supports the International EMF Scientist Appeal by 244 scientists from 41 countries who have published on the subject in peer-reviewed literature and collectively petitioned the WHO and the UN for immediate measures to reduce public exposure to artificial electromagnetic fields and radiation.

Evidence also exists of the effects of radiofrequency electromagnetic radiation on flora and fauna. For example, the reported global reduction in bees and other insects is plausibly linked to the increased radiofrequency electromagnetic radiation in the environment.¹⁷ Honeybees are among the species that use magnetoreception, which is sensitive to anthropogenic electromagnetic fields, for navigation.

Man-made electromagnetic fields range from extremely low frequency (associated with electricity supplies and electrical appliances) to low, medium, high, and extremely high frequency (mostly associated with wireless communication). The potential effects of these anthropogenic electromagnetic fields on

natural electromagnetic fields, such as the Schumann Resonance that controls the weather and climate, have not been properly studied. Similarly, we do not adequately understand the effects of anthropogenic radiofrequency electromagnetic radiation on other natural and man-made atmospheric components or the ionosphere. It has been widely claimed that radiofrequency electromagnetic radiation, being non-ionising radiation, does not possess enough photon energy to cause DNA damage. This has now been proven wrong experimentally.^{18,19} Radiofrequency electromagnetic radiation causes DNA damage apparently through oxidative stress,⁷ similar to near-UV radiation, which was also long thought to be harmless.

At a time when environmental health scientists tackle serious global issues such as climate change and chemical toxicants in public health, there is an urgent need to address so-called electrosmog. A genuine evidence-based approach to the risk assessment and regulation of anthropogenic electromagnetic fields will help the health of us all, as well as that of our planetary home. Some government health authorities have recently taken steps to reduce public exposure to radiofrequency electromagnetic radiation by regulating use of wireless devices by children and recommending preferential use of wired communication devices in general, but this ought to be a coordinated international effort.

*Priyanka Bandara, David O Carpenter

Oceania Radiofrequency Scientific Advisory Association, Scarborough, QLD 4020, Australia (PB); and Institute for Health and the Environment, University at Albany, Rensselaer, NY, USA (DOC)
pri.bandara@orsaa.org

We declare no competing interests. We thank Alasdair Phillips for assistance with the figure and Victor Leach and Steve Weller for assistance with the ORSAA Database, which has enabled our overview of the scientific evidence in this area of research.

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For the Oceania Radiofrequency Scientific Advisory Association see www.orsaa.org

For the International EMF Scientist Appeal see www.emfscientist.org

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PENNSYLVANIA PUBLIC UTILITY COMMISSION**

MIRANDA GRACE EDWARDS,

Complainant,

vs.

DUQUESNE LIGHT COMPANY,

Respondent.

No. C-2018-3002741

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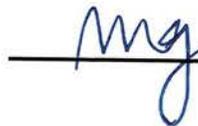
VIA PAPER FILING AND EMAIL:

Paul Shane Miller, Esquire
PA I.D. No. 319174
smiller@tuckerlaw.com
1500 One PPG Place
Pittsburgh, PA 15222
Fax: 412-594-5619

VIA PAPER FILING AND E-FILING:

Administrative Law Judge Jeffrey A. Watson
Pennsylvania Public Utility Commission
Piatt Place, Suite 220
301 Fifth Ave.
Pittsburgh, PA 15222

Dated this 14th day of February, 2020



Miranda Grace Edwards
msea.mdew@gmail.com
3835 Acorn Street
Pittsburgh, PA 15207

Miranda Grace Edwards: 412-726-8329

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**BEFORE THE
PENNSYLVANIA PUBLIC UTILITY COMMISSION**

MIRANDA GRACE EDWARDS,

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No. C-2018-3002741

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VIA PAPER FILING AND EMAIL:

Paul Shane Miller, Esquire
PA I.D. No. 319174
smiller@tuckerlaw.com
1500 One PPG Place
Pittsburgh, PA 15222
Fax: 412-594-5619

VIA PAPER FILING AND E-FILING:

Administrative Law Judge Jeffrey A. Watson
Pennsylvania Public Utility Commission
Piatt Place, Suite 220
301 Fifth Ave.
Pittsburgh, PA 15222

Dated this 14th day of February, 2020



Miranda Grace Edwards
msea.mdew@gmail.com
3835 Acorn Street
Pittsburgh, PA 15207