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Testimony BOE <testimony.boe@boe.hawaii.gov>

KAHUKU TURBINES

1 message

Patricia Greene <greeneohana@aol.com> Sun, Jan 10, 2021 at 11:47 AM
To: testimony.boe@boe.hawaii.gov

To Whom It May Concern:

I am Testifying AGAINST Any TURBINES NEAR ANY HUMAN BEINGS. This is An EXTREME PHYSICAL & MENTAL INTERFERENCE IN SOME HUMANS. Medically Very Dangerous to Many
with DISABILITIES.
I am a 1969 Graduate of KAHUKU HIGH SCHOOL.
Punalu'u is Where I Grew Up Nearby Kahuku.

Patricia L. L. Greene

Sent from my iPhone

Gmail

Testimony BOE <testimony.boe@boe.hawaii.gov>

Testimony

1 message

Jamie Dela Cruz <jamie.delacruz@k12.hi.us> Sun, Jan 10, 2021 at 8:18 PM
To: testimony.boe@boe.hawaii.gov

14 January 2021 State of Hawaii Board of Education Special Meeting

A. Board Action on petition of Sunny Unga, Petition No. 20-01 proposing the adoption of a new administrative rule

I oppose the adoption of Exhibit A. It is vague in reason and places another duty on Principals' already overburdened plate without explanation, procedures, support, nor parameters.

Mahalo,

Mr. Jamie M. Dela Cruz
Proud Principal of Kaimukī High School
2705 Kaimuki Ave, Honolulu, HI 96816
808-733-4900 Ext. 225
808-733-4929 Fax
"Every student deserves a great teacher not by chance but by design."
~Douglas Fisher, Nancy Frey, and John Hattie

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Testimony BOE <testimony.boe@boe.hawaii.gov>

Testimony in Support for agenda item II.A. Sunny Unga's Petition No. 20-01

1 message

Joshua Kaina <joshsavekahuku@gmail.com> Mon, Jan 11, 2021 at 10:44 PM
To: Testimony.BOE@boe.hawaii.gov

My name is Joshua Kaina and I am submitting testimony for the Special Meeting on January 14, 2021.

Mahalo, Board Members for taking time to read our testimonies. I am in agreement with Mrs. Unga's petition for a rule change. I understand that it is not the Board of Educations responsibility to get community input when asked to provide comments on land use or developments near public school facilities. However, I would like you to make it your responsibility. As the overseers of our public school system you are an integral part of our community whether you live here or not. The decisions you make impact our lives. A healthy and vibrant school system is one that includes strong relationships between students, teachers, staff, parents and community members. It also includes transparency. Transparency in decision making is something my generation and the generation after me are very passionate about. It is something that we demand and will continue to pursue going forward as we all adjust to these changing times. We want to build sustainable, more resilient communities and I believe we can, if we work together and communicate openly. A major part of building these communities and empowering our people involves understanding the unique features of each community. The culture, the geography, the languages, the socioeconomic status, the food supply or food scarcity in that area, and so on.

When you add favorable comments or offer no objection to an EIS, without taking community input you are doing a disservice. I know that you are overburdened and I cannot begin to understand the challenges you face coming from the top, bottom, left or right. I know that asking you to make this change will add one more job to an already lengthy list of duties but I assure that it is needed. This is an opportunity to embrace the communities you are a part of. To get to know them, so you can make decisions that are holistic and look at the bigger picture of community and what that means.

I am saddened that it took a lawsuit to get the BOE to have this public hearing. This is exactly why we need this rule change, to keep things transparent. To relieve you from the burden of having to make decisions on proposed items that you may not know enough about. We as a community are here to help you make those decisions and offer you insight into where we stand and why. Please listen to us and make this rule change as a means of growing your community engagement in hopes that many hands can make light of the work at hand.

Mahalo, Joshua Kaina

Gmail

Testimony BOE <testimony.boe@boe.hawaii.gov>

RE: Testimony in Support of Sunny Unga's Petition for Rule Change Petition No. 20-01

1 message

Jessica dos Santos <nrtshrlv@gmail.com> Tue, Jan 12, 2021 at 12:49 PM
To: Testimony.BOE@boe.hawaii.gov

To whom it may concern,

My name is Jessica dos Santos and I strongly support Sunny Unga's Petition for Rule Change No. 20-01.

I am a lifelong resident of Kahuku, a Hawai'i educator of 14 years, and, most importantly, a parent. I am very concerned about the proximity of the NPM turbines to our schools and community and the lack of consensus and conclusiveness in the research surrounding the possible detrimental health effects industrial turbines could have on people, especially children, and other high-risk populations. If we do not know for sure that industrial turbines do not cause harm to our keiki and kupuna, it is unjust to relegate us to bear this type of burden, being guinea pigs of a potentially dangerous health experiment, without our consent. There are many community members that have been questioning whether or not their health conditions, migraines, severe autism meltdowns, epileptic seizures, tinnitus - a persistent ringing in the ear which causes sleep deprivation and stress -, nausea and dizziness, cardiovascular disease, sleep disturbance, are being caused by low-frequency sound waves and sound from the current Kahuku Wind Farm. During our fight, I worked with a team researching, for months, all of the reliable sources we could find. There has never been a study completed on any community that is this close, to this large of a turbine. My son would be 26 years old by the time the NPM turbines face decommissioning and he would have spent a majority of his youth being exposed to these potentially degrading health effects in the most vulnerable of his educational years.

It was disheartening that the BOE submitted an official comment without having heard our concerns or being sure of the potential unsafe learning and working environment the turbines would create. If the DOE has a duty to ensure that the students and faculty have a safe learning environment, it seems only right that more time would be taken to truly consult with the community and conduct more in-depth research into the impacts before making any comment. Had the BOE raised concerns over the proximity of the turbines to the school, it may have influenced the state to require a larger setback. I urge the leaders of the BOE and the DOE to take a drive out to Kahuku and spend time at Kahuku Elementary School or Kahuku District Park where our children play to hear the constant swoosh of the turbines and see their colossal presence hovering over the schools. Then perhaps you would realize our additional anger at the fact that no emergency plan is in place, or being addressed to our knowledge, should there be tower collapse, blade throw, or fire at NPM.

When sending our students to DOE schools, parents want to have trust that the school system is doing everything possible to keep our children safe, therefore it is paramount that there be more transparency and trust-building with the community when it comes to large scale developments near schools and libraries. This rule change is a necessary step towards a better, and more just, relationship with the BOE and community.

Respectfully,
Jessica dos Santos
nrtshrlv@gmail.com
808381-4069

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Jessica A. dos Santos
Phone: (808) 381-4069

Kahuku Community Association

PO Box 540
Kahuku, HI. 96731

RE: Testimony in Support of Sunny Unga's Petition for Rule Change

January 12, 2020

To whom it may concern,

On behalf of the Kahuku community the Board members of the Kahuku Community Association have voted unanimously to strongly support Sunny Unga's Petition for Rule Change No. 20-01.

The Kahuku Community Association is gravely concerned for the health and safety of the Kahuku community and especially the keiki in regards to the close proximity of the Na Pua Makani Industrial Wind Turbines to our Kahuku High and Intermediate and Kahuku Elementary schools. We are especially concerned for the health and safety of our keiki as the schools are in shockingly close proximity to the enormous industrial wind turbines. These turbines could present a clear and present danger to our keiki at school as well as their teachers and staff. There are instances of industrial wind turbines malfunctioning, being set on fire (release of chemical smoke), and the possibility of blade throw (when a turbine blade detaches and flies off) which could directly impact the safety of our keiki. There are also currently no safety plans in place from the Department of Education should there be any issues with the industrial wind turbines. We are also concerned for the health of our keiki as there can be risks associated with industrial wind turbines due to infrasound that may affect a child's health including- migraines, severe autism meltdowns, epileptic seizures, tinnitus, sleep deprivation, stress, nausea, dizziness, and cardiovascular disease. We are asking that the Board of Education (BOE) play a role in assuring the health and safety of our keiki by supporting this petition for rule change.

Sincerely,
Maria E. Tejada
(Acting) President Kahuku Community Association

Kahuku Community Association

PO Box 540
Kahuku, HI. 96731

Kahuku Community Association Board of Directors

Maria E. Tejada - Acting President
Jessica Dos Santos - Secretary
Desiree Nawahine - Treasurer
Sunny Kim Unga
Atalina Pasi
Joshua Kaina
Melissa Camit
Leialoha Kaanaana

Gmail

Testimony BOE <testimony.boe@boe.hawaii.gov>

Testimony in Support for agenda item II.A. Sunny Unga's Petition No. 20-01.

1 message

Sunny Unga <sunnyrkim@gmail.com> Wed, Jan 13, 2021 at 5:46 AM
To: testimony.boe@boe.hawaii.gov

Aloha board members,

Thank you for giving my petition for rule change a public hearing and providing an opportunity for the public to express our thoughts and feelings. I hope that as you make a decision this coming Thursday, that you will contemplate this issue seriously and hope that each one of you will act in good faith to the public and have the courage to weigh in the public's opinion and reflect them in your decision.

Each board member is either a grandparent, mother, father, aunty or uncle, if not yet, will have one or more of these roles in the near future. And I believe that all of you love your children, grandchildren and nieces and nephews and care for the Keiki of Hawaii. If there is anything that would bring harm to their health, safety, wellbeing and detrimentally impact their learning environment at school, I am sure all of you would rise up to do something to change that.

And for this reason, I decided to petition for rule change because I believe something can be changed to ensure better protection of our keiki. And for this same reason, over 200 community members, most of them being grandmothers, mothers, and aunties were willing to get arrested to protect whom they loved dearly, our keiki. Such drastic measures were taken during two months in November and December of 2019 because this wind project that now towers over Kahuku Elementary, Intermediate, and high school will have irreversible impacts to our keiki's health, wellbeing, safety, and learning environment for the next 20 years, during very important developmental stages for our Kahuku children.

Have any of you personally come to visit our schools in Kahuku and witnessed the travesty of these turbines erected next to our keiki's learning facilities? These 568 feet industrial turbines are the closest and largest land turbines ever located to a school and residential community in the United States. Once you come and see for yourself, you will feel what our community feels. The sheer height and proximity of these turbines stick out like a sore thumb and detrimentally impact our keiki, the very students the DOE must advocate for.

So naturally, when I found out that the DOE had actually provided official comments regarding this wind project in the EIS, only stating that the students will hear the turbines and failing to raise any other concerns regarding the project, I was shocked. How could there be such a stark difference between the community vehemently opposing a project and the DOE having no real concerns? Kahuku schools and the community experienced much contention that resulted from this conflicting view between the school and the community and our children suffered as a result of that.

Our Keiki went through a traumatic experience where they witnessed their own mothers, fathers, family members and neighbors get arrested over this project. Many students expressed sadness, anger, and anxiety in school during this time. Rather than helping our students process these complex emotions, the school administration prohibited teachers from discussing any issues related to the project that was happening literally in their community. I, as a mother, along with

many other mothers in our community, attempted numerous times through email, letter writing, meetings to raise our deep concerns to our school administrators to no avail leaving us feeling ignored and shut down. This petition for rule change is necessary to inform the school administrators on how the parents and impacted community feels about projects nearby their schools. Oftentimes the school it is impossible for the school administrators or Department of Education to know and understand what's happening on ground level. Having a public meeting prior to the DOE making any official comment will better align views of the school and community and will prevent this kind of conflict and contention.

In addition, the DOE is frequently asked to provide official comments regarding projects occurring near schools and has provided them even without its authority over proposed developments. As a well established state government institution, the DOE's decisions carry significance and have strong influence.

With that being said, we all understand that the community is an essential part of the school and the school is also an essential part of the community, especially in rural communities. Oftentimes, the school becomes part of the community's identity as in the case of Kahuku. With this understanding, it is difficult to justify that whatever the comments the DOE states to the state, county agencies or private landowners on proposed developments are its own views and not the views of the community and is separable. DOE's opinion on projects in their community has a great impact on its students and community. Because of this close relationship with the schools and its communities, if the school supports a project, it gives the appearance that the community supports it as well.

If the community and the school has a differing perspective and the community feels that projects nearby schools compromises the safety and wellbeing of its learning environment in the school grounds or facilities, the DOE has a duty to ensure that their students and faculty have a safe learning environment and the DOE must address these concerns. Talking to the very community that will be impacted by these projects is the best fact finding method to uncover concerns at the grassroots level. It will allow the DOE to become aware of parents' concerns and provide an opportunity to address them early on in the process. If parent's concerns are legitimate, then the DOE must be willing to support its students and advocate on behalf of them to ensure a healthy and safe learning environment. These concerns must also be reflected in its official statements and comments on EIS's.

We cannot allow another tragedy of Kahuku to happen in another community with its own school, a place where our keiki are supposed to feel safe, a place that will allow our students to feel empowered, a place that should provide the best learning environment that would allow them to reach their full potential. More than ever before, we need greater transparency and a better relationship between the school and its community. This rule change can foster a positive relationship with the BOE and community. Please, let's learn from what happened in Kahuku and improve how we do things.

Changing this administrative rule and accepting my petition can only help by allowing meaningful community engagement which helps the DOE to better align its processes within its department with the principles of the Sunshine law. Please be an advocate for our keiki by supporting this petition for rule change for it will only better protect our keiki's learning environment at school, health, and safety. Consulting parents and affected communities and reflecting their voice and concerns prior to making any official comment is the step in the right direction.

Mahalo!

Gmail

Testimony BOE <testimony.boe@boe.hawaii.gov>

Kahuku Schools must be relocated if Na Pua Makani Wind Farm is allowed to operate in Kahuku

1 message

Dawn Bruns <dawnbbruns@gmail.com> Wed, Jan 13, 2021 at 8:29 AM
To: testimony.boe@boe.hawaii.gov
Cc: Sunny Unga <sunnyrkim@gmail.com>, htsuneyoshi@honolulu.gov, "Sen. Gil Riviere" <senriviere@capitol.hawaii.gov>, Rep Sean Quinlan <repquinlan@capitol.hawaii.gov>

Aloha Board of Education,

The level of low-frequency sound at your elementary and high school, when the Na Pua Makani turbines are fully-operational (which does not seem to be happening yet), is on par with the levels experienced by the airfield personnel at the jet installation discussed in this video (https://livestream.com/itmsstudio/events/8781285/videos/196181579?fbclid=IwAR1Md-Kag5rpcWID6Dk8N68wNLp989W3lndZZepRVaUUFyK7d0MMAS8Jyd0). The level of low-frequency sound the children and staff would be exposed to if Na Pua Makani is allowed to operate will cause changes to the tissues of their organs, regardless of whether or not they are "sensitive" to or feel the turbines. For this reason, I encourage you to either move the school (and the town), or remove the Na Pua Makani wind turbines.

Please be sure to read Chapter 3, Case Histories, the raw data, in this $11 book, free shipping, describing wind turbine impacts to 37 individuals https://kselected.com/2017/05/09/wind-turbine-syndrome/. I know this physician's conclusions are debated by the wind industry, but the raw data is not under debate.

A copy of the text from my https://nonapua.com/ website is attached with summary figures and links to my Google drive literature collection. I've only been to Kahuku twice when the Na Pua Makani turbines have been on, and I haven't sent any of the wind turbine low frequency sound to the lab for analysis, but the 83 dB at 8 Hz (which means 108 dB at the 1 Hz fundamental frequency) they disclosed in their EIS is on par with the fighter jet occupational exposure in the video I linked to above, and I assume that's what's happening in the town of Kahuku. The school shouldn't be occupied by your staff or students when the Na Pua Makani Wind Farm is operating.

Dawn Bruns
Kapuai Place, Sunset Beach, Haleiwa, HI 96712

Honolulu Approves Most Dangerous Wind Farm In United States - Text to Dept of Education 1-13-2020.docx
3286K

Honolulu Approves Most Dangerous Wind Farm In United States

- Letter to AES Warning Not to Construct - Health Effects Anticipated

Text from Website maintained by Dawn Bruns* (Sunset Beach Resident, Sunset Beach Community Association board member) **The findings and conclusions in this website are those of the author and do not represent the official views of the U.S. Fish and Wildlife Service.*

Follow the latest on Ku Kia'i Kahuku Website and **Facebook:** Ku Kia'i Kahuku Public Facebook Page – Videos, Updates, Public Information and Kū Kia'i Kahuku – A'ole Wind Turbines Facebook Page – Closed Group

Summary of public health effects expected to occur on Oahu from the low-frequency impulse sound from the proposed wind turbines Folder: Wind Turbine Noise Health Effects. Please read Chapter 3 of this ou shouldn't make any decision regarding wind turbines near children without reading the 27 examples of wind turbines affecting residents in the $11 book, https://kselected.com/2017/05/09/wind-turbine-syndrome/ before making any decision regarding wind turbines in proximity to students living or learning locations. Additionally, understand that the level of low-frequency sound at your elementary and high school, when the Na Pua Makani turbines are fully-operational (which does not seem to be happening yet), is on par with the levels experienced by the airfield personnel at the jet installation discussed in this video (https://livestream.com/itmsstudio/events/8781285/videos/196181579?fbclid=IwAR1Md-Kag5rpcWID6Dk8N68wNLp989W3lndZZepRVaUUFyK7d0MMAS8Jyd0

- The Na Pua Makani 3.45 Vestas Megawatt turbines would be the largest wind turbines ever installed on land in the United States. Larger turbine blades cause higher levels of low-frequency sound (pulses of air pressure with each turbine blade pass). As it is, the low-frequency air pressure pulses from existing smaller turbines have been preventing REM and deep sleep of residents within five miles – crippling resident learning and formation of memories and accelerating amyloid plaque formation and associated dementia progression). I strongly recommend everyone get serious about monitoring their REM and deep sleep and take protective measures to prevent permanent damage to career development and progression of dementia (REM and deep sleep are associated with clearing tau and beta-amyloid proteins from the brain during sleep). In October, when I first realized the turbines were the cause of my sleep disturbance, I tracked sleep quality by noting how I felt each morning; now I use an at-home EEG device *Dreem headband – $500 (Dec holiday sale – $300) to monitor (to track REM and deep sleep) to assess whether you are getting your 3 hours of REM and deep sleep.* It is also crucial that residents assess their blood pressure at home, near the turbines, if their doctor's office is not near the turbines to avoid permanent damage to their heart, kidneys, and other organs from undetected high blood pressure (which only occurred at home, near the turbines, but not at the doctor's office removed from turbines). Residents are also waking up with headaches (not caused by sleep apnea), and putting up with popping ears, dizziness, and behavioral problems in children. As it is, the small existing turbines are endangering residents within five miles – distance affected would double in distance for each 3 decibels of low-frequency sound level increase caused by additional, and larger, turbines.
- Na Pua Makani, owned by AES Corporation from Arlington, Virginia, has inexplicably received approvals to construct eight Vestas 3.45 MW turbines (0.31 mile (502 meters, 549 yards, 1,648 feet) from the residential-zoned subdivision of Kahuku, where Kahuku Elementary, Kahuku High School, and Kahuku Medical Center and Emergency Room, and approximately 450 homes would be within 2,000 meters of the wind turbines.
- **The 2014 TetraTech Noise Assessment in the EIS says, in black and white, the low-frequency noise from the wind turbines (if they were smaller 3.0 MW turbines assessed in their EIS) would cause 83 dB at 8 Hz and 76 dB at 16 Hz in the residential area of Kahuku, exceeding the 65 dB 16 Hz ANSI threshold for onset of annoyance / nuisance. and far exceeding the 45 dB 16 Hz threshold for**

severe impact from wind turbine low-frequency pulses shown in the graph below (Cape Bridgewater study by the wind farm itself, 2014). The noise attributes of the actual 3.45 MW turbine they are bringing in is not disclosed – all we know is the low frequency impulses from the 3.45 MW turbine will be higher sound pressure levels than any other wind turbine operating on land in the US (Larger Turbines = Higher Sound Pressure Pulses). Because the applicant's own document anticipates nuisance noise, we don't need to experience it to get it shut down. Because the applicant's noise assessment is for a 3.0 MW turbine and they are bringing in a 3.45 MW turbine, nothing more is needed to halt their construction (nuisance noise litigation summary) (Nuisance law, everybody has the right to do what they want with their property — as long and they don't prevent me from using my property.), Getting Permits Does not Allow Nuisance Wind Farm to Operate). There is no mitigation other than distance – the damages would far exceed the wind farm's gross receipts (for power they dump into a tiny distribution line where most of it will dissipate as heat – this is crazy). We can't all go live in underground bunkers for the next 20 years to be able to sleep. If these turbines are built, they are coming down.

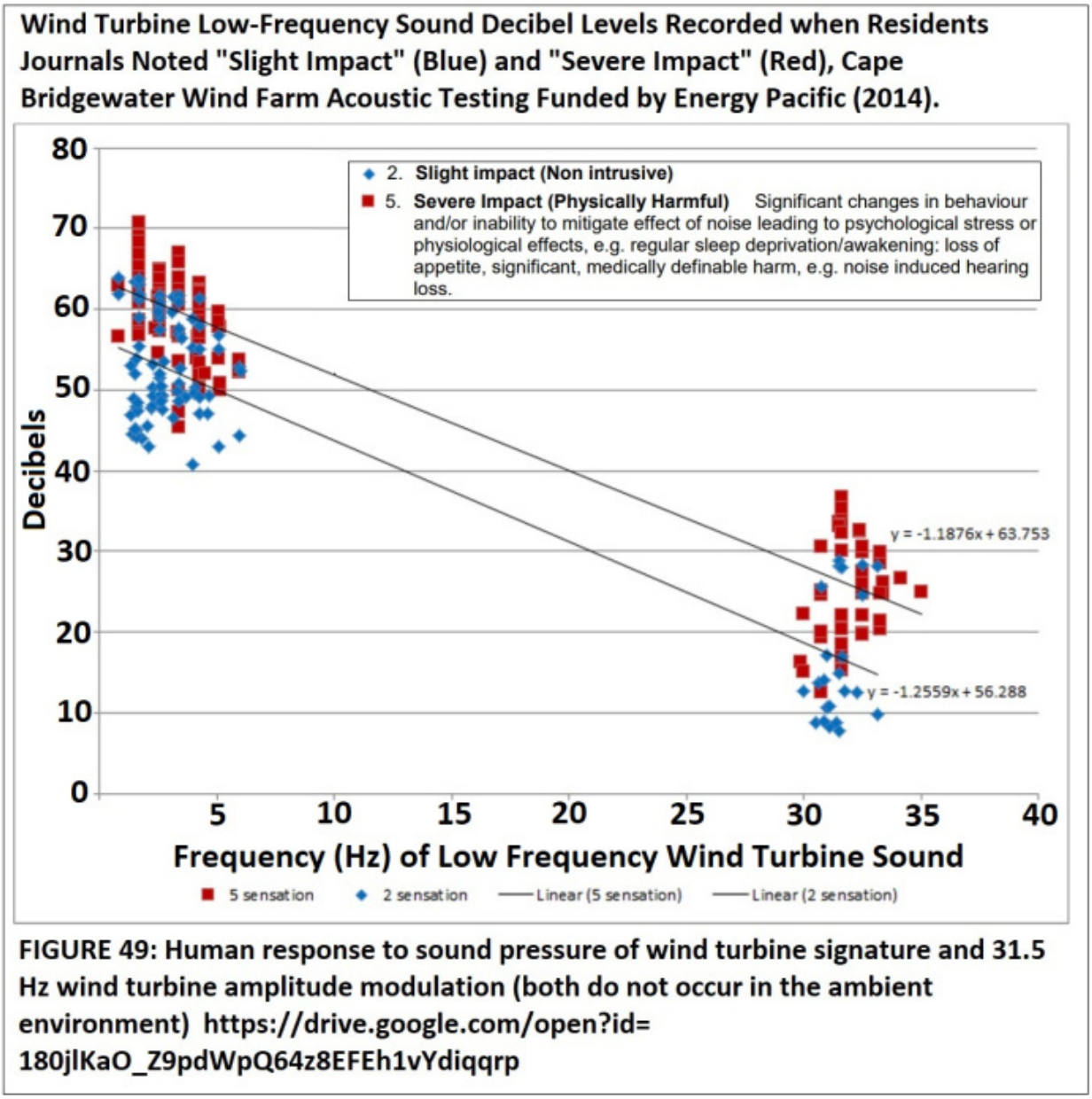


FIGURE 49: Human response to sound pressure of wind turbine signature and 31.5 Hz wind turbine amplitude modulation (both do not occur in the ambient environment) https://drive.google.com/open?id=180jlKaO_Z9pdWpQ64z8EFEh1vYdiqqrp

Resident reports of severe and slight wind turbine impacts in relation to measured low-frequency sound levels, Cape Bridgewater study by the wind farm itself, 2014.

- 

September 2019 Construction at Na Pua Makani wind farm site. The Kahuku Elementary School and the residential-zoned area with 350 homes, are located immediately west (left) of this frame, even closer to the turbine pad than the high school and residents in the picture.

- Na Pua Makani's EIS asserts "***Adverse effects to property values not anticipated.***" The EIS also asserts there would be ***"no high or adverse effects to any minority or low income population and, therefore, no environmental justice issues resulting from this Project."***
- Folder: Wind Turbine Noise Health Effects; Videos: Falmouth, MA Health Board 2012, 2019 NY Wind Turbine Health Hearings, Australia, New Zealand Residents, Infrasound Noise Equipment Midwest, UK residents 10 km setback request.).
- Honolulu, Kauai, and Maui will be exposed to low-frequency pulses of air (inaudible sound) from the Na Pua Makani wind turbines. Even at my house's three-mile close distance, most of the low-frequency sound from the current small turbines comes from above.

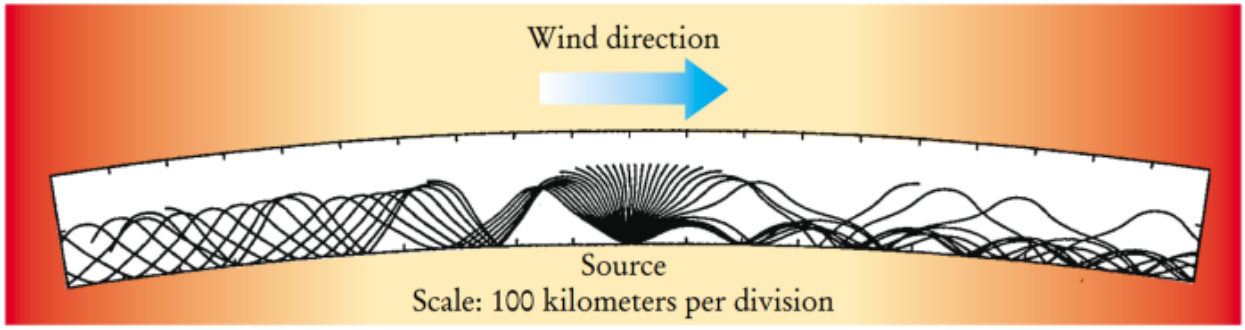


FIGURE 4. COMPUTER RAY TRACE models how infrasound at a frequency of 1 Hz is refracted and channeled over long distances by the temperature and wind structure of the atmosphere. A 60 m/s jet of wind blowing to the right at 60 km altitude is simulated to show the difference between upstream and downstream propagation. Rays that end abruptly are absorbed by atmospheric viscosity and thermal conduction.

Honolulu, Kauai, and Maui will be exposed to low-frequency pulses of sound from the Na Pua Makani wind farm. This figure from Physics Today (2000: https://physicstoday.scitation.org/doi/pdf/10.1063/1.883019).

- A high percentage of the Kahuku and Pupukea residents living within 1.3 miles (2,100 meters) of the smaller existing wind turbines are experiencing annoyance (including sleep disturbance, headaches after exposure to the wind turbines for two hours, waking with tinnitus, high blood pressure that resolves when the person moves away from the wind turbine, and children acting up). These symptoms are markedly absent when the wind turbines are off. I live three miles downwind from the 2.5 MW smaller turbines of the Kahuku Wind Farm and I get the normal three hours of REM and deep sleep in six to eight sleep cycles when the Kahuku turbines are off – even when it's windy – and feel tired, even after sleeping 12 hours, when the turbines are on at night (and get an average of 30 minutes of REM and deep sleep those nights – For $500, you can buy a personal EEG to monitor REM sleep, and less accurate (but useful because the differences turbines on vs. turbines off/away from turbines is so great, you can use Whoop, Apple, or similar wristbands that monitor heart rhythm and calculates periods of REM sleep). After three weeks of chronic sleep disturbance, I notice I have short-term memory problems – like someone with early signs of dementia – which go away after I get a week or so of normal sleep by traveling for work (or in January when the turbines in Kahuku were off for a period). Below are screen captures from sound recordings at Sunset Beach under windy, light wind, and turbines off for maintenance conditions:

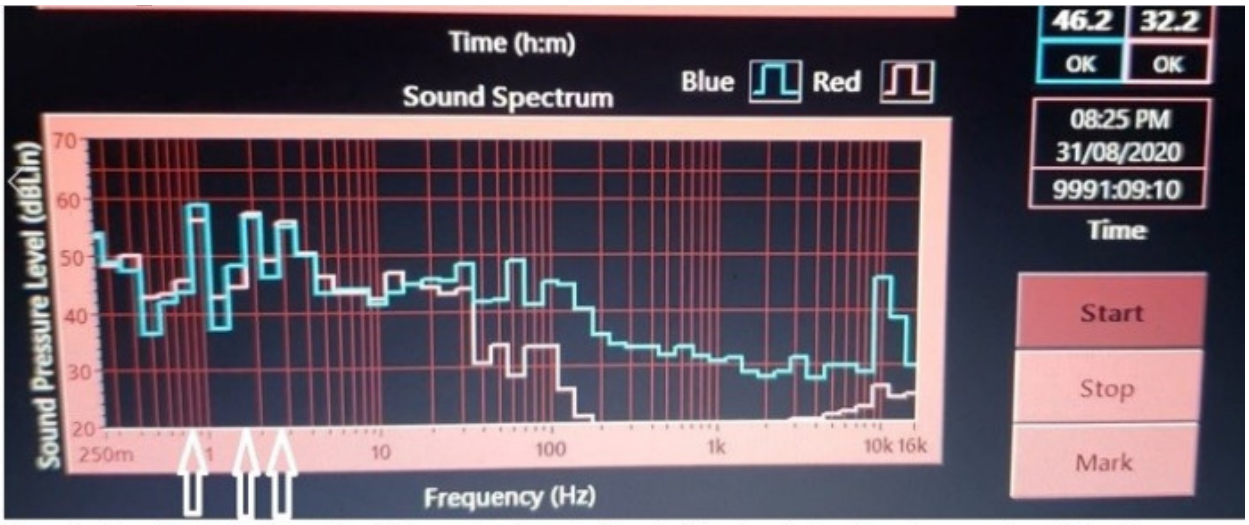


Figure A. Blue microphone Sunset Beach (three miles downwind from turbines), red microphone in garage "crypt" sleeping area (which does nothing to block 1 Hz, 2 Hz, and 3 Hz low-frequency air pressure pulses "low-frequency sound pressure" registering at 55 60 dB (see white arrows). Winds were 18 MPH, gusts to 26, from the east (92 degrees).

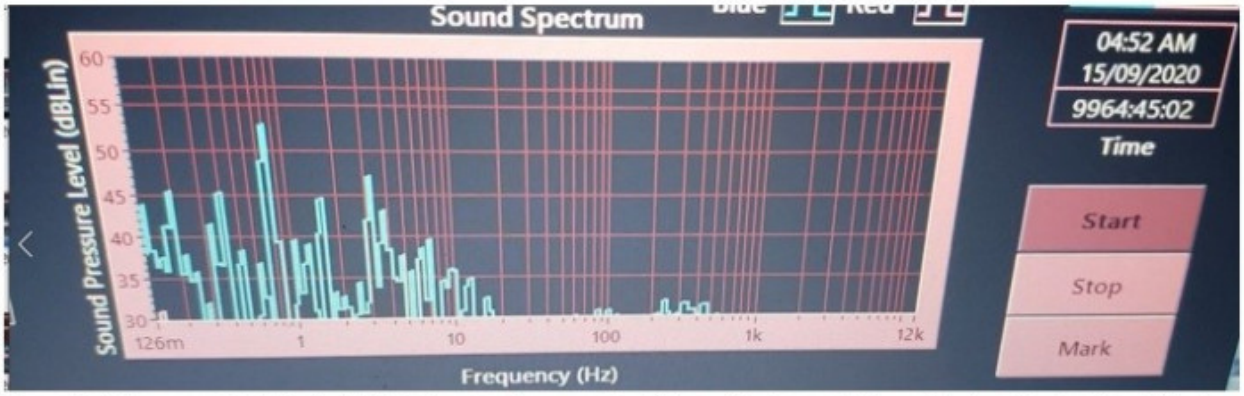


Figure B: Turbines on with light wind. This is the sound pressure level three miles downwind from Kahuku with about the lightest winds the turbines are allowed to operate during April through October nighttime (James Campbell Weather Station: winds 10, gusts to 13, 99-degrees/East wind). This 50-55 dB 1 Hz signal (and its 2 Hz and 3 Hz harmonics.

-
- In Kahuku and Kawailoa (within two miles of the existing turbines), I get a headache – fullness in my head. Within 1,400 meters of the turbines, I feel nauseous. The Na Pua Makani Wind Farm would cause 8 Hz sound pressure level of 83 dB at Kahuku Elementary School – extraordinarily high levels of low-frequency sound. The existing wind turbines are smaller than the proposed turbines – there are 30 2.3 MW turbines one mile (1,600 meters) downwind from the Pupukea neighborhood and there are 12 2.5 MW turbines 0.7 mile (1,200 meters) downwind from Kahuku. If the existing turbines were not scheduled for removal in 12 years, it would be worthwhile to litigate to have the existing turbines removed due to nuisance noise.
- If the low frequency sound of the 3.45 MW turbine is only 3 dB higher than the current 2.5 MW turbines, the sound pressure level I am exposed to at my house when my sleep is disturbed by the current turbines, would occur 6 miles from the new turbines. Laie and Sunset Beach would experience similar levels of low-frequency sound pressure level. The rule of thumb for low-frequency sound attenuation is each increase of 3 dB, doubles the distance exposed to the annoyance-levels of low-frequency wind turbine noise.
- In 2011 through 2013, when these turbines became operational, residents in Kahuku and Pupukea, even in places where the wind farm noise is not audible, immediately noticed not feeling rested after "sleeping", irritability, headaches, tinnitus, and heart palpitations. Chronic exposure to the wind turbines has given some people high blood pressure. When the turbines are off (when there is no wind or they are

all off for some other reason), children in Kahuku and Pupukea who are normally rambunctious and agitated in the morning (what the parents thought as their child's normal personality) have noticeably calm mornings.

- When the existing smaller wind turbines in Kahuku and Kawailoa Wind Farms are off for the 5 m/s April – November low wind speed curtailment, or when they are down for maintenance during high winds, residents, even 3.2 miles away are now realizing we feel tired the next day, even after eight hours of "sleep"; when the turbines are completely off, it is striking how soundly we sleep. We would like the existing turbines to be turned off at night to prevent endangered bat deaths and to enable us get a good night's sleep. In Wisconsin, eight 2.5 MW Clipper wind turbines (the same model as the 12 turbines currently operating in Kahuku) were declared a public health hazard because they adversely affected human health at residences 4.2 miles away (low-frequency sound detected in homes 6 miles away).
- One low-frequency noise source does not "mask out" another (as Na Pua Makani claims) – they are additive. The 2014 noise assessment says the existing ambient sounds in these low frequencies sometimes exceeds the 16 Hz 65 dB annoyance threshold – Presumably from the existing wind turbines or the continuous white noise of large ocean surf rumbling across the reef. The concerning thing is noise is cumulative – one source of noise does not "mask out" another – they are additive. For this reason, the loud window AC units the wind farm funded for Kahuku schools (presumably to mask the audible turbine sound) are likely to backfire and cause the impulses of sound to appear even louder in the classrooms. A 40 decibel 8 Hz pulse from a wind turbine in a soundscape with 40 decibel 8 Hz sound means distinguishable 44 decibel pulses from the turbine register. (Note, Because decibels are logarithmic, 40+40 = 44, rather than 80). Noise effects are cumulative – because Kahuku (from existing turbines) and the North Shore (during the winter swells) are already exposed to high levels of low-frequency noise, the impact of the proposed turbines would be even more serious than if the turbines were located somewhere with low levels of low-frequency sound. At our house, North Shore breaking surf is usually white noise as the large whitewater rumbles across the Sunset/Backyards and Waialee reefs – only once in a while does a giant individual wave break on Twisted Sister and wake us up – surf can be giant and as long as Twisted Sister isn't causing individual standout noise, we sleep very soundly when there is big surf (when the turbines are off).
- All of these adverse health effects constitute "nuisance" and "annoyance". The burden of proof for prosecuting nuisance is easy so that's how wind farms all over the world are litigated. The burden of proof for adverse health effects is more difficult; it is not necessary to say these are adverse effects to health – simply they are annoyance and nuisance.
- Low-frequency sound attenuates (decreases) at a rate of 3 dB per doubling of distance (Nasa 1985), the sound impulses experienced three miles from the smaller turbines would occur six miles from a turbine that is 3 decibels louder. A turbine that is 6 dB higher pulse pressure would cause a person 12 miles away to experience the same pressure pulses we experience at three miles from the smaller existing turbines. The island of Oahu is only 44 miles long.
- Two US wind farms have been taken down because of sleep disturbance, psychological conditions in children and adults, high blood pressure, and other adverse health effects, which are, in laws protecting US residents, considered "nuisance" and "annoyance" Falmouth, MA Health Board 2012, and Iowa, November 2018. Nuisance and annoyance include all of the adverse health effects, but have a lower burden of proof – nuisance is easy to prosecute. If even one of the proposed 3.45 MW turbines is built and allowed to operate, the human health effects would be so far-reaching, I assume the City Council will legislate updated wind turbine size limits and setback requirements that will result in Na Pua Makani removal (or this may be a good time to re-consider splitting Honolulu's rural areas into a separate county so we can protect ourselves). It costs only $150,000 to take down one wind turbine. And there will be no need for the estimated $100,000/day it is costing AES to arrest the public blocking the trucks hauling turbine parts to the wind farm. AES indicated decommissioned wind turbine blades would be put in our landfill. The wind turbines, tower sections, and blades should be loaded back on the ship they came in on.
- Prosecution at other wind farms is based on annoyance from wind turbine low-frequency (for instance 8 Hz) sound resonating structures in the audible 38-42 Hz, 60-80-110-115-120 Hz frequencies in homes, schools, the hotels, and the hospital with a line of sight to the new turbines. If the turbines end up being built and allowed to operate, a class action law suit would require the affected people to raise a minimum of $700,000 (by taking out home equity loans, during a period when their home equity has evaporated

because of the wind turbines) to pay lawyers and an expert witness acoustic specialist. Class-action litigation enables residents, parents of affected school children (including wealthy North Shore lawyer parents), and the hotels to recuperate the harm done to them during any periods of time the turbines are allowed to operate. Turtle Bay Resort, alone, with 400 rooms at $400/night reimbursing their guests who have trouble sleeping – at 80% full occupancy would cost them $128,000/night. I have no idea what harm done to their 5-star ratings would do to Turtle Bay's future profits, but I have a feeling Na Pua Makani is about to find out. At maximum capacity, Na Pua Makani would only gross around $10 Million a year – so it's ideal that AES is a multi-billion dollar company.

- AES Chief Operating Officer Mr. Miller's assertion that these high-decibel impulses of audible and low-frequency sound from the spinning turbine blades would not directly affect human health is like saying cigarettes do not directly affect human health – as if the "direct" connection is limited to something like a pallet of cigarettes falling and crushing someone.
- The 65 dB ANSI threshold for low-frequency sound is based on effects of less-harmful traffic and aircraft noise. The physiological response to wind turbine sound is significantly greater than the physiological response to the same decibel sound from traffic and aircraft noise Schaffer 2016.
- There is no safe place for a 3.45 MW wind turbine to operate on any island in Hawaii; no turbine larger than 2.5 MW should be built on Oahu, and the existing 2.3 and 2.5 MW turbines should be shut down at night or moved farther away from our residential areas. Alternatively, areas we want to operate industrial wind turbines near residential areas should be re-zoned industrial.
- **To inform updated wind turbine setback requirements, ALL Oahu residents should begin noting, on a calendar, days you wake and feel well-rested.** If you have time, jot down the following each day when you wake up:
  You should also jot on a calendar each morning if you: Have a Headache? Have ringing in your ears? Feel very tired? Children are quiet or agitated? Because high blood pressure can occur after six months of chronic exposure to wind turbines, and the high blood pressure can resolve when the wind stops or when people living near turbines go to work in another town, it's also important for Oahu residents to learn to monitor blood pressure at home. Permanent damage to your heart and kidneys can develop from undetected, untreated high blood pressure.
- If you are interested in assessing whether or not the wind turbines are affecting your sleep, you can look at the hourly wind speed data for yourself. April through November, all Hawaii wind turbines are shut down (to somewhat reduce bat kills) when wind is less than 5 meters/second (around 11 mph). So if wind speed, all night, at the weather station 20 feet off the ground, was well below 11 mph, the turbines at Kahuku and Kawailoa Wind Farms were off all night, if it was near 10 mph, the turbines could have started up/stopped several times during that hour (Hourly Wind Speeds – James Campbell NWR weather station)
- If you find the current wind turbines have affected your health, send confidential health effects of the existing small wind turbines to: webmail@doh.hawaii.govand, to inform the November 22, 2019 hearing about Na Pua Makani Wind Farm, send general (not confidential) information about the health effects to PUC.comments@hawaii.gov Subject: Docket # 2013-0423 (the Na Pua docket number).
- Low frequency 16 Hz sound caused by the wind farm would exceed 65 dB – they do not disclose the distance the exceedence will occur; they do not disclose any sound information about the new 3.45 MW turbine. The EIS indicates the 65 dB low frequency noise would be masked by existing noise, even though no such noise currently exists in their residential area noise monitoring data. Their EIS indicates "*2.3.1 15BANSI S12.9 Part 4 The ANSI S12.9 Part 4 (ANSI 2005 https://drive.google.com/open?id=1ENwJAf_6lSUE98rhQKeeR2NcakcJbt4T) provides guidelines for determining annoyance from sound propagating outdoors. Annex D of ANSI S12.9 Part 4 includes methods for assessing environmental sounds with strong low-frequency content. Annoyance is found to be minimal when sound levels in the low frequency midband frequencies of 16 – 63 Hz are less than 65 dB, which corresponds to the threshold for the onset of impacts in these lower frequencies. Part 4 also states that LFN passes through structures with relative ease and is nearly equal to outdoor predicted sound" "Negligible low frequency noise/infrasound impacts." Page ES-6. Infrasound: "The nearest legal residence is located 814 feet (248 meters) from a proposed turbine. Low frequency noise/Infrasound level is predicted to be 83 dB at 8 Hz and 76 dB at 16 Hz which are both well below the threshold of human hearing and the DEFRA limits but higher than the ANSI S12.9 Part 4 guideline of 65 dB at 16 Hz. With regard to the 65 dB ANSI S12.9 Part 4*

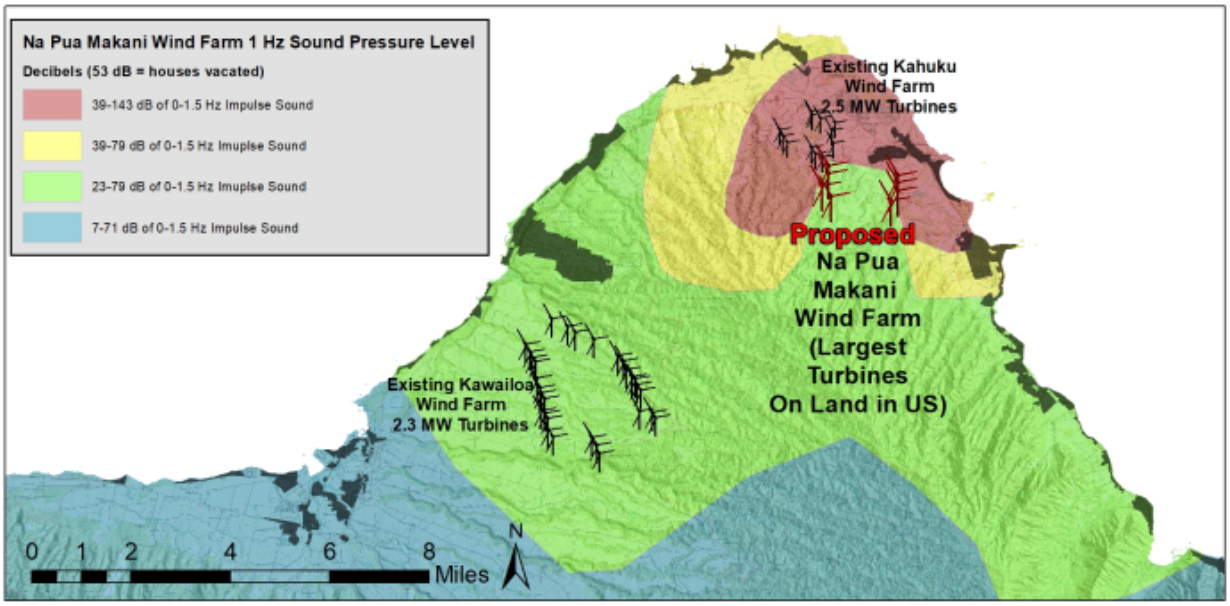
guideline, because the baseline sound levels are already above this threshold, the likelihood of complaints is low given that the low frequency noise/infrasound would be at least partially masked by existing low frequency noise / infrasound. Therefore, there is no anticipated low frequency noise / infrasound impact from the Project".

- The EIS says there would be "*no high or adverse effects to any minority or low income population and, therefore, no environmental justice issues resulting from this Project.*" According to the Census Bureau, Kahuku has a total population of 2,614 people in 622 housing units (53% owner-occupied; 47% renting) that are 8.6% (224) white, 34% (888) Native Hawaiian; 26% (641) Filipino, and 31% (823) two or more races, 62% born in Hawai'i, 23.5% born in foreign country. Twenty five percent of the of population 25 years and older did not graduate from high school; 53% of Kahuku residents completed no more than 8th grade.

Na Pua Makani Wind Farm's gross misrepresentations of the effects of the 3.45 MW turbines to human health in their application submittals for various licenses and permits give the regulatory agencies grounds to rescind the Na Pua Makani Wind Farm licenses and permits without a need for litigation.

Impacts would be far-reaching – well beyond Kahuku:

Based on published sound data from other wind farms (see links to publications below) and the limited infrasound data provided by the developer, the 1 Hz low-frequency (inaudible) impulse sound produced by each turbine blade pass could be between 103 dB and 143 dB. Because low-frequency sound does not attenuate rapidly like audible sound, these impulses would impact residents more than 30 miles away (see figure below). These turbine blade impulses (spikes) of sound are below 1.5 Hz (harmonics develop at higher frequencies).



Residents many miles from the proposed Na Pua Makani Wind Farm would be exposed to chronic high-energy impulses of low-frequency, inaudible sound energy. Link to Video of Oct 10, 2019 Koolauloa Neighborhood Board Meeting (starting at 56:00) and Link to Oct 10, Koolauloa Neighborhood Board Powerpoint

Impulses of the fundamental frequency, approximately 1 Hz, low-frequency sound would exceed 90 decibels at the two schools in Kahuku and may be 71 decibels in Kaaawa and Waialua. If Na Pua Makani Wind Farm is allowed to operate during school hours, the schools and university in Kahuku, Laie, Sunset Beach, Haleiwa, Waialua, and Hauula should be closed to protect student health. The Hawaiian Islands are too small to house such large wind turbines.

Kahuku Community Association, Kū Kia'i Kahuku, Sunset Beach Community Association, North Shore Neighborhood Board members, Keep the North Shore Country, Life of the Land, State Senator Gil Riverie, State Rep Sean Quinlan, City Councilmember Heidi Tsuneyoshi, pro-bono lawyers, paid lawyers, and members of the community are working on many fronts to prevent implementation of Na Pua Makani Wind Farm.

Sunset Beach Community Association
P.O. Box 471
Haleiwa. HI. 96712

SBCA 1959-2019

October 8, 2019

Dear Mayor Caldwell,

Please rescind the Na Pua Makani Wind Farm building permit to protect public health from audible and low-frequency noise. We believe Na Pua Makani Wind Farm underrepresented the level of audible sound the wind farm would produce, and failed to disclose the significant public health risks associated with wind turbine noise pollution. September 10, 2019, AES told Laie Community Association attendees the wind farm's audible sound would exceed the levels previously disclosed to the public, which warrants your removal of the building permit (https://vimeo.com/359776610?fbclid=IwAR0HJ48ugZc5p2am1eA2jC7bxJIC-b11ZI9NE_jYAoVYH-jHb1qcDT2HDJ4).

The existing Kawailoa and Kahuku Wind Farms adversely affect resident sleep and health; residents find relief when the wind stops blowing and the turbines are not operating. To inform DPP's development of updated wind turbine setback requirements, please establish a secure portal for residents to submit private information about the effects existing wind turbines are having to their health. We are concerned the proposed wind turbines would dramatically affect human health in Kahuku. In addition, because the proposed turbines would be larger and cause higher decibel levels of low-frequency impulse sound than smaller existing turbines, we are concerned the proposed very large turbines could cause sleep disturbance in Beach, Haleiwa, and Waialua neighborhoods. If Na Pua Makani continues to pursue a permit to construct the project, please ensure the applicant discloses the maximum sound pressure level of 0 to 1.5 Hz impulse sound Na Pua Makani Wind Farm would cause on the landscape.

Sincerely,

Board Member

for Andrea Woods
Corresponding Secretary
Sunset Beach Community Association

cc: Councilmember Ron Menor
Councilmember Heidi Tsuneyoshi
Senator Gil Riviere
Representative Sean Quinlan

(Video of Laie Community Association AES Presentation September 10 2019).

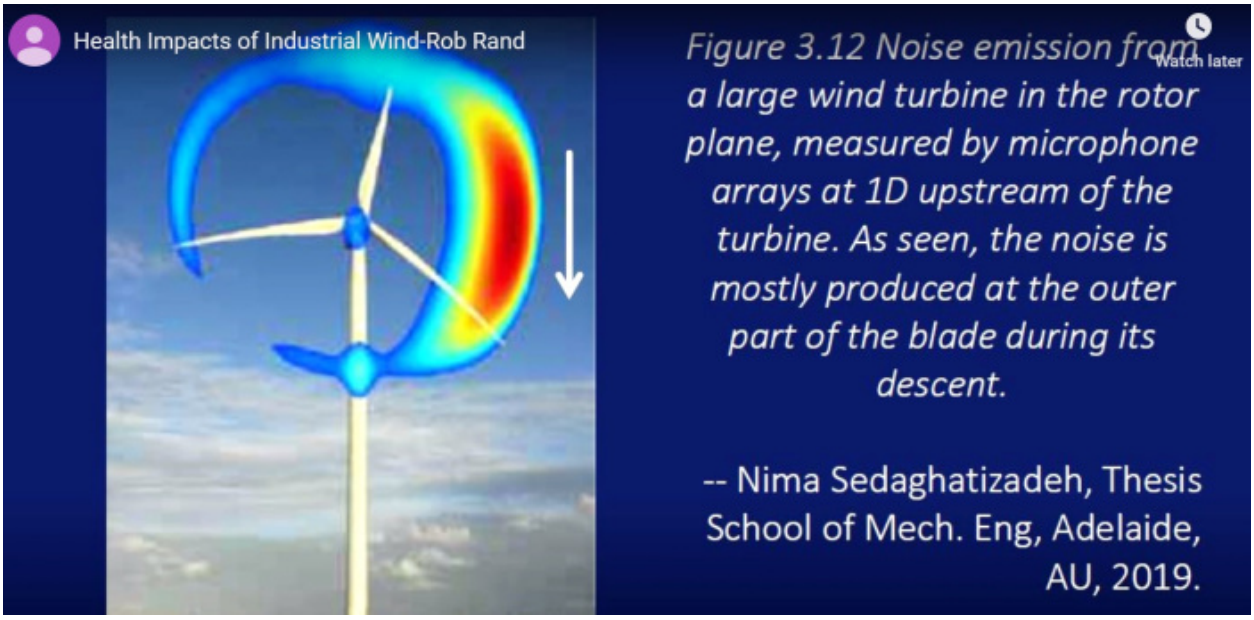
These proposed Na Pua Makani turbines would be the largest wind turbines ever built on land in the US. The repetitive low-frequency impulses (0.5 to 1.5 Hz, inaudible sound (1 Hz sound has a wavelength of 1,100 feet (343 meters)) from each turbine downward blade pass of the tower (and the harmonics of that sound (2, 4, 6, 8 Hz, etc) adversely affect human sleep, blood pressure, and psychology. Because these wind

turbine health effects resolve (with the exception of permanent damage resulting from undetected, untreated conditions such as high blood pressure) when there is no wind or when people sell homes/move, the cause of these health conditions is attributed to the wind turbines (Reviewed in Punch and James 2016; Peer Reviewed Scientific Journal Articles Health Effects Wind Turbines: 2012, 2010; link to health effects references folder: Folder: Wind Turbine Noise Health Effects; Videos: Falmouth, MA Health Board 2012, 2019 NY Wind Turbine Health Hearings, Australia, New Zealand Residents, Infrasound Noise Equipment Midwest, UK residents 10 km setback request.).

Kū Kia'i Kahuku – A'ole Turbines (photo by Nate Yuen)

We need to know what the maximum sound pressure level of 0.5 to 1.5 Hz sound the turbine will produce. Based on the information in the wind farm's 2014 noise study, and sound physics information, we can estimate anticipated low-frequency noise levels. Because page 44 of the wind farm's 2014 noise study discloses the low-frequency 8 Hz sound pressure level (if this were a 3.0 MW turbine, rather than the "louder 3.45 MW turbine) would be an extraordinary 83 dB at 205 meters (where the elementary school and residential subdivision are), sound pressure level at 8 Hz would exceed the 65 dB ANSI S12.9 Part 4 (ANSI 2005) Annex D threshold for onset of adverse effects to humans two miles away from the wind farm (based on 6 dB attenuation for the first 1.2 km, and 3 dB attenuation for the subsequent doubling of distance (Nasa 1985 and Hansen et al 2015).

Rhythmic low frequency impulses in the 0 to 1.5 Hz range are produced when the fast-moving turbine blade passes the support tower (harmonics of that frequency result at 2x, 4x, 8x etc., that fundamental frequency). Low-frequency noise sound pressure level increases with turbine blade length and because available turbine size increases each year, previous noise research was conducted near turbines that are smaller and produce significantly less low-frequency (0-1.5 Hz) sound than the proposed Na Pua Makani 3.45 MW wind turbines. The number of impulses per second increases and decreases with wind speed and adjustments made to the turbine blade – the human brain appears to be particularly interested in paying attention when the rhythm is changed. Each impulse also causes harmonics (see below).



Very high rates of adverse health effects would occur in the town of Kahuku if Na Pua Makani was allowed to operate. Example of "Very high" rates of adverse effects: Nissenbaum et al 2012 found that more than 70% of people living within 1,400 meters of industrial wind turbines wish to move away from the wind turbine, 24% of them started new prescription psychotropic drugs in the six months to three and a half years since the turbines were installed (versus zero in the farther from turbines groups), and 36-64% reported improved sleep when away from the turbines (versus 4-9% of people living farther from turbines). McMurtry 2011 and McMurtry and Krogh 2014 attribute the cause of adverse health effects to a wind turbine when the person resides within 3.1 miles (5,000 m, 5 km) of a wind turbine and symptoms ameliorate when the person moves farther than 3.1 miles (5 km) from the wind turbine. The risk of adverse health effects is reduced four miles from wind turbines Nissenbaum et al 2012 although 2.5 MW Clipper turbines (the same model as the 12 at the Kahuku Wind Farm) were declared a public health hazard because they were adversely affecting resident's health 4.2 miles (6,759 meters) away (Wisconsin eight 2.5 MW turbines declared public health hazard).

Wind Turbine Low-Frequency Sound Measurement and Sound Attenuation with Distance:
Examples of sonograms of the sound recorded near wind turbines are shown below. The first figure shows 13-seconds of sound – full-spectrum, including audible noise:

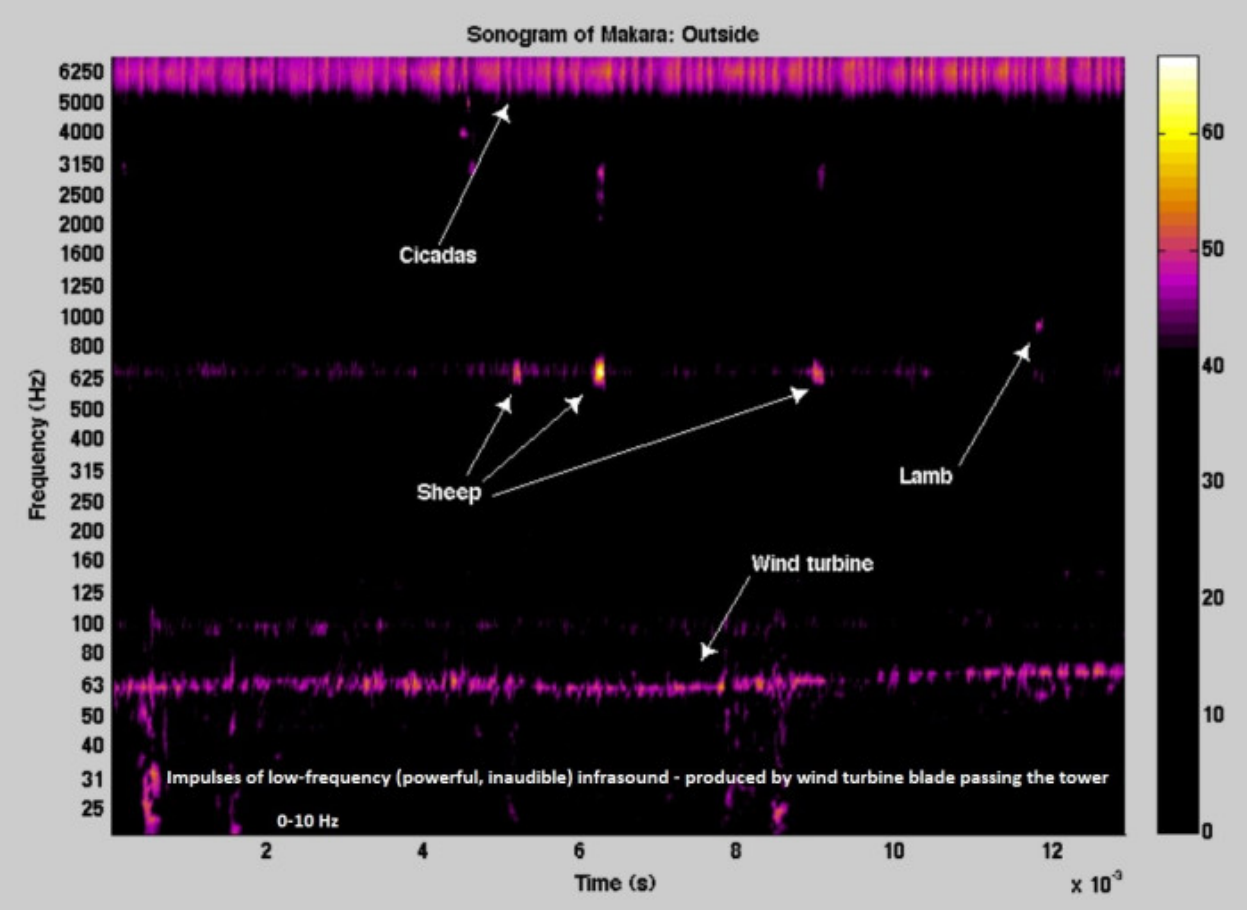


Figure 1. Sonogram, 13 seconds of sound recorded near a wind turbine.The 2014 TetraTech noise study told us the 8 Hz found pressure level would be 83 dB at 200 meters. The figure below shows us how much quieter the 8 Hz sound is than the fundamental frequencies (at 1.0 and 1.3 Hz) (Pilger and Cerrana 2016). The figure shows the 5-minute averaged sound measured over three days. 1.0 and 1.3 Hz fundamental frequencies produced by the turbine blades, and harmonics of those vibrations (multiples of the fundamental frequency, like octaves, all produced by the original/fundamental (and louder) 1.0 and 1.3 Hz vibration of air (sound) visible as horizontal stripes. The lower-frequency sound is wind pressure on the sensor. Because these are five-minute averages, the decibel level of the impulses (distinct high-pressure sounds) are much higher decibels than the five-minute average.

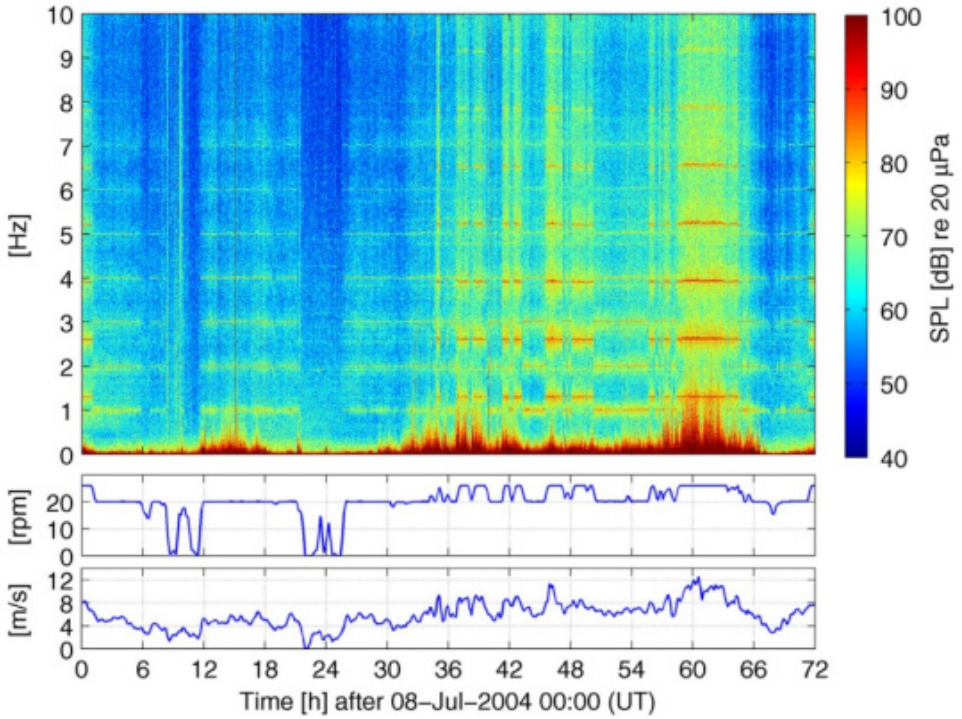
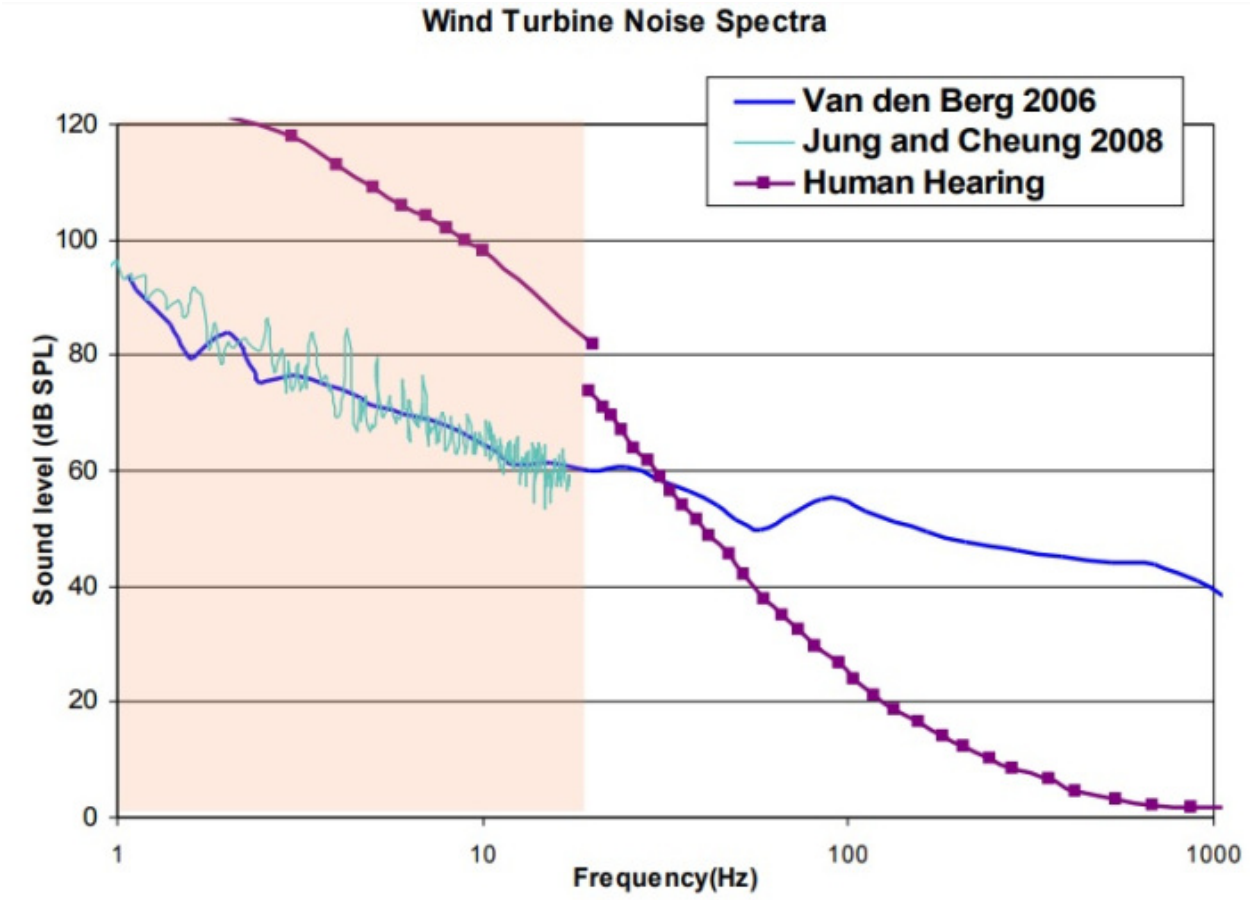


Fig. 5. Time-frequency analysis of pressure recordings at site 3 showing colour-coded sound pressure levels (SPL) over a period of 72 h, saturated at 100 dB. The lower two graphs show the corresponding rotational speeds of the wind turbine blades and the prevailing wind speeds at the hub.

Five-minute average sound level – comparison of 8 Hz harmonic with much louder 1 Hz fundamental frequency produced by the wind turbine blade (Pilger and Ceranna 2016))

In all of the data I've seen, the fundamental frequency impulses (below 1.5 Hz) are at least 20 decibels louder than the 8 Hz sound level. The following figure from Salt, shows wind turbine blade sounds in relation to the threshold of human hearing. 8 Hz wind turbine sound is around 68 decibels and the sound pressure level of the turbine blade fundamental frequency (below 1.5 Hz) is above 90 decibels. Low frequency sound is audible if it's very loud – you can listen to low-frequency sound on your cell phone or or computer speakers if you turn the volume up very high (lots of YouTube videos of low-frequency sound played as continuous, white noise – high volumes can damage your hearing but the white noise is a continuous sound, not an impulse sound, so other than damage to your ear structures, listening infrasound at an audible (high) volume will (depending on the frequency) generally not hurt you.



Low-Frequency Sound Attenuation (Transmission Loss):
Rule of thumb is low-frequency sounds attenuate with doubling of distance at much lower rate than audible sound. A rule of thumb is low-frequency sound attenuates at an initial rate of 6 dB/doubling of distance the first 1.2 km, then 3 dB/doubling of distance (Nasa 1985 and Hansen et al 2015) while audible sound attenuates at 6 to 7.5 dB/doubling of distance.
Sound moves and attenuates differently under different weather and atmospheric conditions. Sound is pushed by the wind, low-frequency sound is reflected by the ground (reflection shown in figure below) and sound bounces off "stable" levels of the atmosphere, essentially creating a tunnel conduit for the sound. Because of the bouncing, areas of the landscape far removed from the wind turbines can experience high levels of low-frequency sound, as shown below.

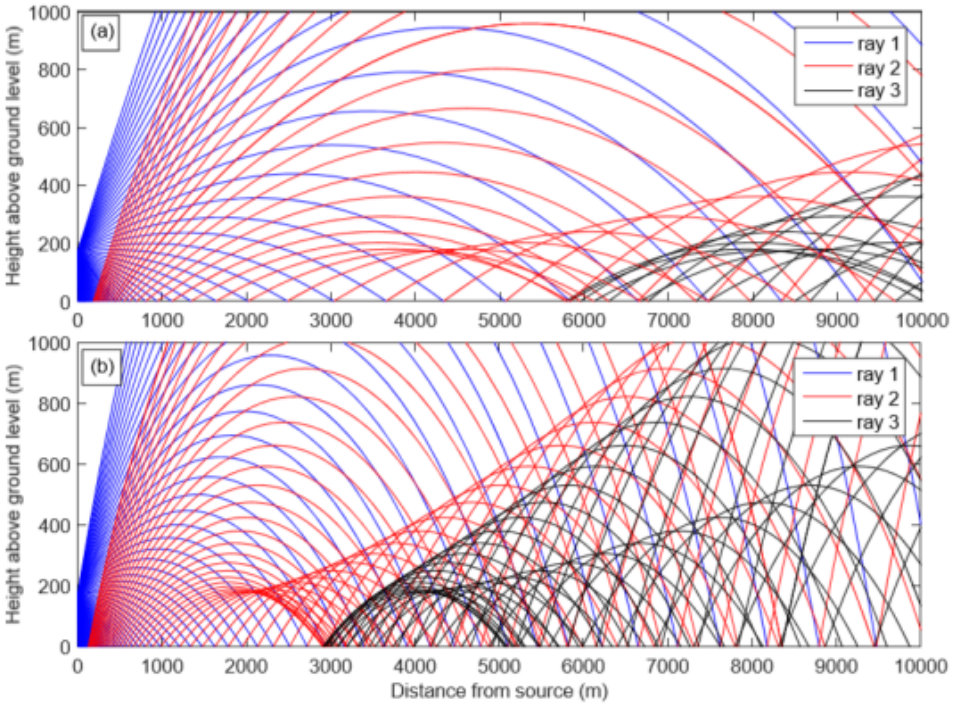
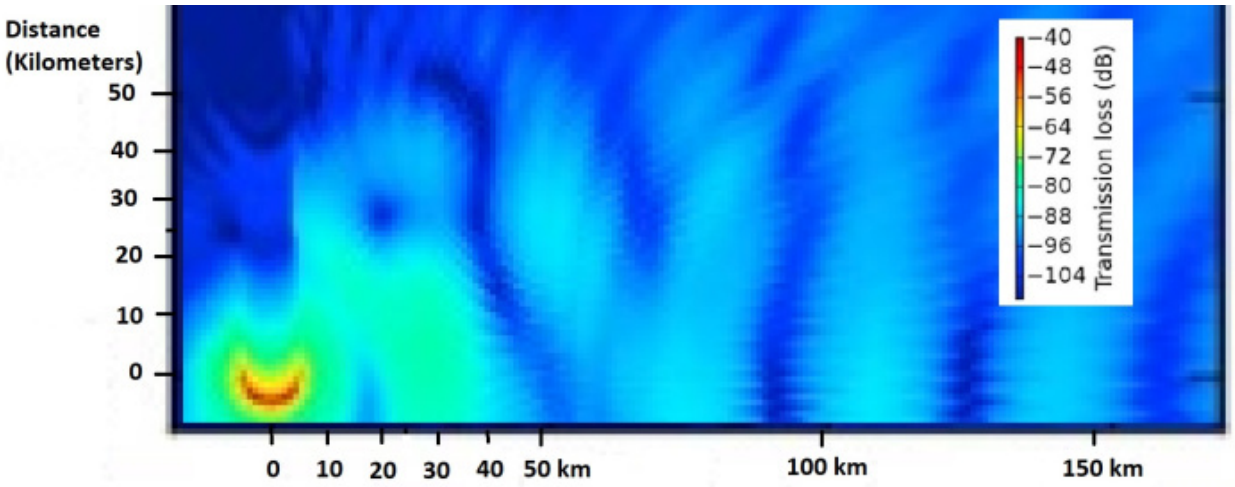
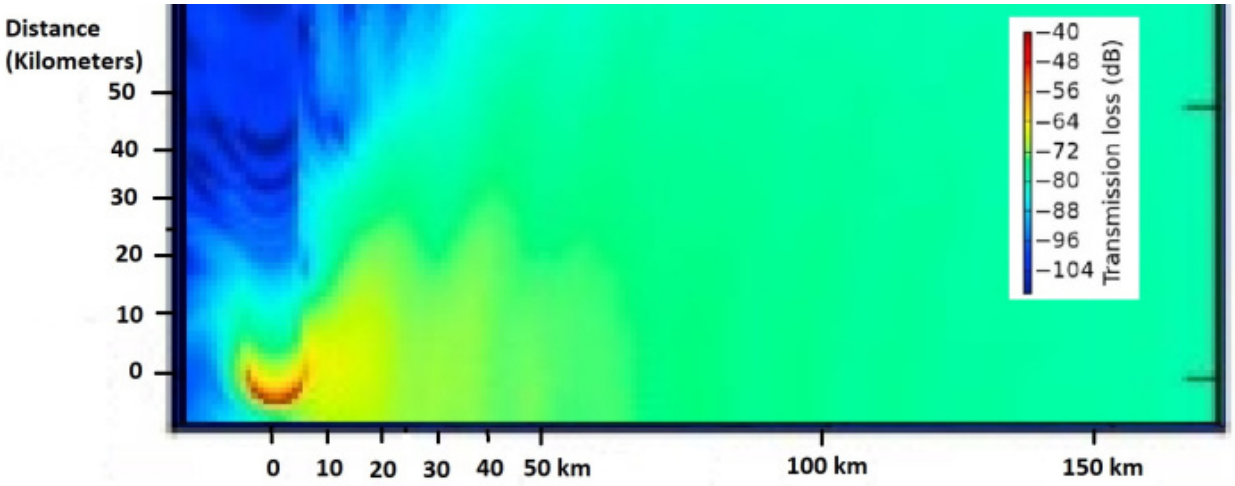


Figure 3 – Results of ray tracing method as calculated for a resolution of 2 degrees for rays leaving the source. Ray 1 corresponds to the ray that leaves the source, ray 2 is the ray that travels from the first to the second reflection point and ray 3 travels from the second to the third reflection point. (a) velocity profile specified by Nord2000 and (b) high wind shear profile determined from SODAR data.

These sound reflections appear to cause what looks like ripples in the 5 pm transmission loss map below – there will be parts of the downwind landscape that receive much higher sound levels than areas closer to the turbines (the sound will skip over some parts of the landscape when the atmosphere is unstable (cumulus cloud conditions for example)). Sound transmission loss maps (shown in the example below) show how many decibels lower the sound will be than it is at the source. Because the Na Pua Makani turbines are larger than any installed on land in the US, and they don't disclose the maximum level of 0.5 to 1.5 Hz sound the proposed turbine would produce, the ranges presented below are estimates based on the information they did provide in the 2014 noise assessment. The 1 Hz (fundamental frequency) of the low-frequency turbine sound will be between 103 dB and 143 dB (as described below) 200 meters from the wind farm. Using the transmission loss maps below (subtract the transmission loss on the map below to determine what the dB level would be at any particular point), that means that people five to six km (3.1 to 3.7 miles) from the wind farm would be in an area where transmission loss is less than 50 dB, so the low-frequency impulses from the turbines would be 53 to 93 dB (103-50 to 143-50), day and night. At 30 km (18.6 mi) downwind from the wind farm, where transmission loss in the unstable (daytime) atmosphere is approximately 72 dB, the 143 dB sound would be 71 dB (143-72); 103 dB sound would be 31 dB (103-72). At night, during stable air conditions, the transmission loss 30 km (18.6 mi) downwind would be only 67 dB, and the sound pressure level would be 35-75 dB.



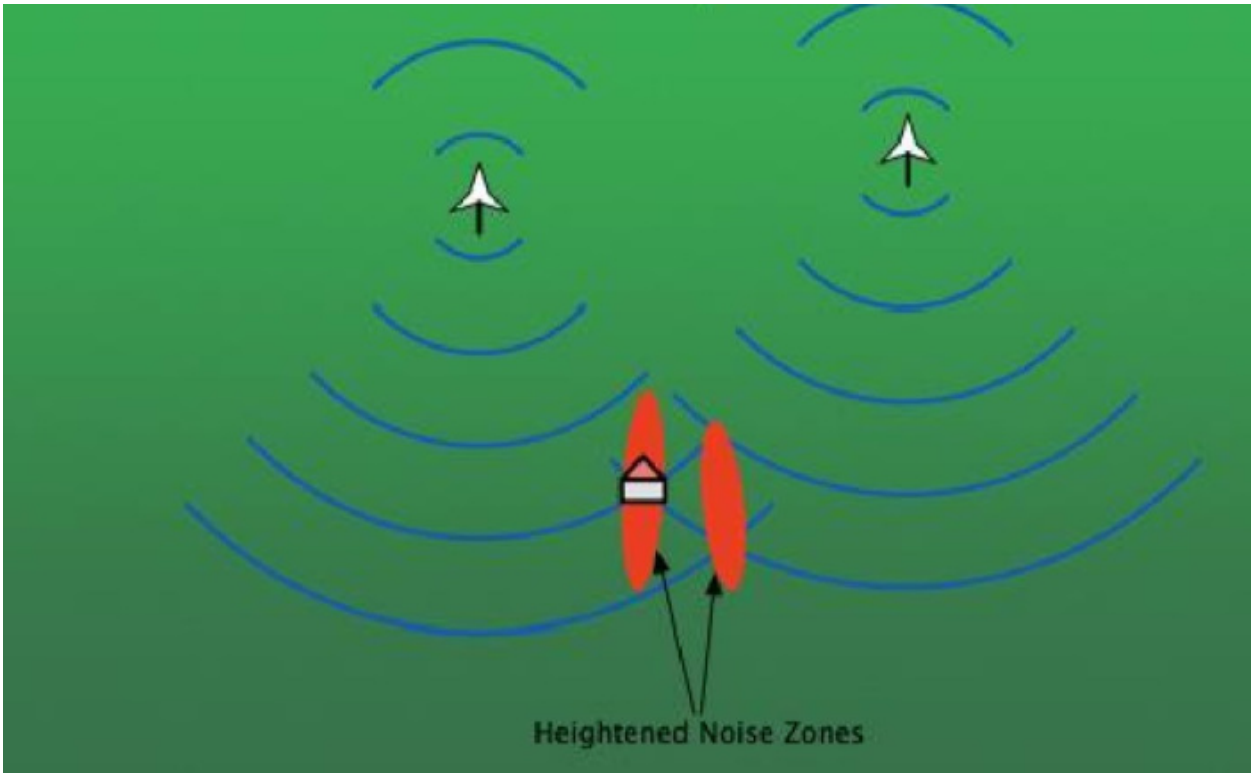
Sound Transmission Loss with Distance (Kilometers) From Wind Farm with 60 1.6 MW Turbines Albuquerque, 5 pm (unstable atmosphere), .9 Hz frequency from Figure 7 in Marcillo et al 2015



Sound Transmission Loss with Distance (Kilometers) From Wind Farm with 60 1.6 MW Turbines Albuquerque, 5 AM (stable atmosphere), .9 Hz frequency from Figure 7 in Marcillo et al 2015

The low-frequency sound information in Na Pua's 2014 noise study are so incomplete there is much room for cherry-picking and misrepresentation of anticipated infrasound from these very large turbine blades. As shown in the figures above (from Marcillo et al 2015), depending on exactly where the measurement is taken, low-frequency sound levels vary dramatically (by more than 40 dB) in different directions and in different patterns in the area within 3 km of the turbine. In this Albequerque, New Mexico wind farm landscape example, with a west wind, sound is very high on the south side of the wind farm and almost silent/background levels that same distance north of the turbine within 3 km of the turbine. Therefore, we can't discount the possibility that the 83 dB disclosed in the 2014 Na Pua noise study (at 205 meters) for 8 Hz sound could be 123 dB on the other side of the wind farm at an equal distance. Additionally, because the highest sound pressure of low-frequency (the fundamental frequency) produced by a wind turbine is between 0.2 and 1.5 Hz range, and sound pressure from wind turbines appear to consistently be 20 dB higher than the 8 Hz sound level (as shown in Hansen et al 2015 Figure 6, for 3 MW Vestas90 44-m blade length turbines), the 0.2 to 1.5 Hz sound pressure level that could be caused by operation of the Na Pua turbine, at 205 meters, could be 143 dB (or more). If Na Pua Makani turbines cause 0.2 to 2 Hz impulses of 103 dB at 205 meters those very low frequency impulses from each turbine blade pass could exceed the 65 dB ANSI threshold more than 100 km (62 miles) away at night. If the 1 Hz sound at 205 meters is 143 dB rather than

103 dB (since 1 Hz fundamental frequency would be around 20 dB louder than 8 Hz harmonic, and to allow for the 205 meter sound level reported being on the "quiet" side of the wind farm), high sound levels would extend even farther than 100 km.
Peaks in sound level will occur on the landscape where sound from one turbine overlaps from sound from the other turbines (or with the white noise background sound of surf whitewater rolling in over the reefs).



Thorne heightened noise zones will occur where sound from adjacent turbines overlaps. Residents closer to the turbines may experience less noise disturbance than these heightened noise zones farther from the turbines.
The most stable atmospheric conditions occur at night (the worst-case scenario would be infrasound sound from a turbine in a gulch such as those above Wā'iāle'e, Paumalū, and Waimea Bay, where the inversion and sinking cold air from the mountains would trap and funnel the sound down through the valley – already known to cause wind turbine sleep disturbance problems at the mouth of Waimea Valley, below the Kawailoa Wind Farm). Fortunately, when the atmosphere is unstable (because of daytime land heating, mixing, cumulus cloud conditions), this sound would attenuate as it's lost into the atmosphere (so maybe we would all just need to sleep during the day).

In the past three weeks, we've realized that since at least 2010, peer reviewed scientific studies have documented harmful health effects of wind turbines and yet Na Pua Makani has always asserted there would be **"no high or adverse effects… from this project"**. October 1, 2019, AES Chief Operating Officer of the US unit of AES Mark E. Miller, in response to a request from the public for a 2.8-mile setback, made the bold startling assertion (to 100 members of the public, who've been sitting in contraflow traffic at Waimea this past week, relocating their farm operations, and suffering sleep disturbance due to blasting at the wind farm construction site) at City councilmember Heidi Tsuneyoshi's public meeting) that the wind farm **"will not have an adverse impact to people"**.

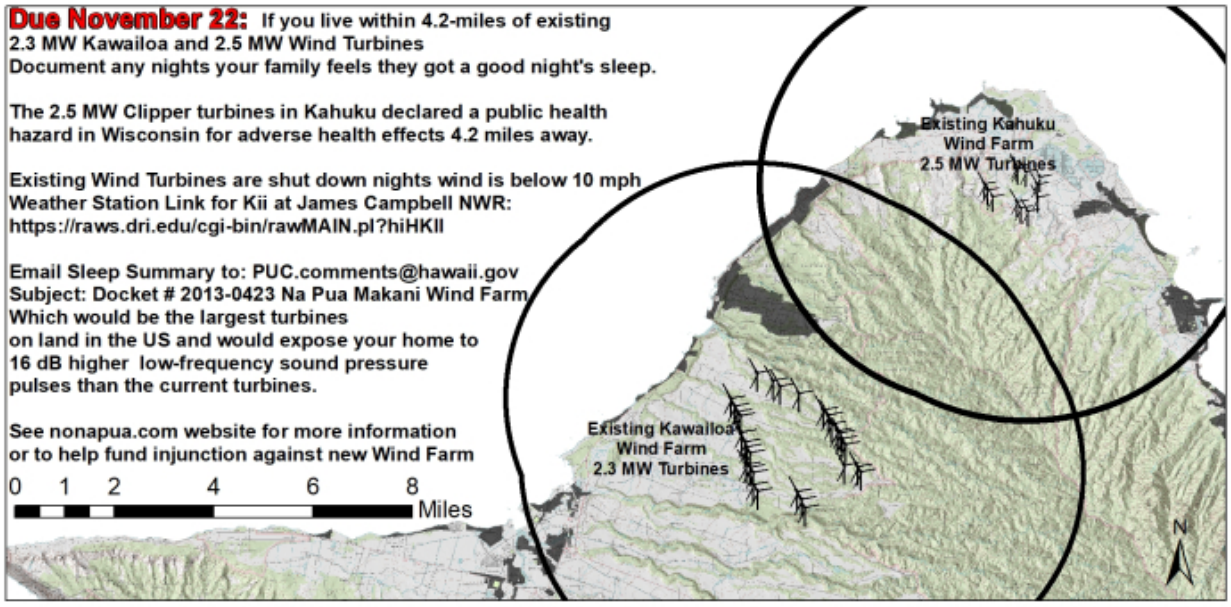
The World Health Organization Assessment of Wind Turbine Health Impacts include the following "The other irrefutable conclusion is that the wind industry has been given a regulatory path to profits **with an unfathomable license to hurt in the form of sleep deprivation (and associated disease) for a very long**

time….there is a direct pathway to disease resulting from wind turbine noise." and "The impacts recognized by the WHO Guidelines are likely to cause some concern for **the wind industry that has chronically, methodically, and systemically, over a long period of time, blocked the flow of information, denying, obfuscating**, and blaming helpless victims for "poor coping skills."

<u>Na Pua Makani Wind Farm's gross misrepresentations of the effects of the 3.45 MW turbines to human health in their application submittals for various licenses and permits give the regulatory agencies grounds to rescind the Na Pua Makani Wind Farm licenses and permits without a need for litigation.</u>
Without any New Legislation, Na Pua Makani May Exceed the Existing Legal Nighttime Audible Noise (dBA) Limit: Na Pua Makani Wind Farm operation would exceed the legal limit that prohibits noise from exceeding 45 decibels more than 10% of any 20-minute period at night in residential-zoned areas. Na Pua Makani said the wind farm would cause audible noise level (dBA) to average (Leq) 44 decibels in the residential-zoned area – if the average is 44 decibels, the noise will exceed 45 decibels more than 10% of the time. Na Pua Makani said ambient noise in the residential area is already 44 decibels at night, but nighttime Leq is a very quiet 28 dB (or lower). Their three permanent noise sensors are located a sea of 6-ft tall guinea grass rustling in the wind (because they claimed they couldn't get permission from any homeowners to put the noise sensor in the neighborhood (see screen capture from noise study below).

> Using mapping and aerial photography of the Project Area, Tetra Tech selected three long term MP locations along the Project's site limit to be representative of noise sensitive receptors (NSRs) nearest to the Project. Tetra Tech attempted to locate monitoring equipment at the structures of the nearest NSR; however, when Champlin requested access from property owners or leases for deployment of monitoring equipment none were agreeable. As a result, Tetra Tech was restricted to placing long-term monitoring equipment at the Project site limit where Champlin had already obtained landowner permission and which was accessible to Tetra Tech. To supplement the long-

Monitor Your Health Near Wind Turbines



<u>Monitor Your Health Near Existing Kahuku Wind Farm</u>:
The 2.5 MW Clipper turbine, currently in use at the Kahuku Wind Farm has been declared a public health hazard by a Wisconsin county where residents 4.2 miles away are adversely affected and low-frequency

sound pulses are detected more than 6 miles away. If you live within 6 miles of the Kahuku Wind Farm (Pipeline through Punaluu), it's important for you to assess the extent to which the current smaller turbines are adversely affecting you. And in preparation for the possible operation of the largest turbines on land in the US operating on Oahu, if you live anywhere on Oahu, it's important for you to begin documenting your current health and quality of sleep.

There are already twelve 2.5 MW turbines 1,200 meters downwind from the town of Kahuku. The Kahuku Wind Farm began testing wind turbines in January 2011, commercial operation began March 23, 2011. On August 1, 2012, all but two of the turbines were shut down until February 13, 2014 after a fire burned the wind farm's battery storage system. Review your personal health records to look for initiation of ringing in your ears, headaches, high blood pressure, nausea, or psychological conditions during periods of operation of the 12 existing 2.5 MW wind turbines.

I recommend you not sleep within five miles of a wind turbine (regardless of whether or not you are aware the turbines affect your sleep). If you decide to stay within 5 miles of a wind turbine, keep a daily journal – track the following on a scale of 0-5 – or for $500 (Dec holiday sale – $300), you can buy a personal EEG to monitor (to track REM and deep sleep) to assess whether you are getting your 3 hours of REM and deep sleep. Even if you don't currently know if the turbines are on or off, document every day so you can provide information to the health department when the time comes to get the Na Pua Makani Wind Farm declared a public health hazard and removed. Even if you are not aware the turbines affect you, exposure to low-frequency sound (from wind turbines, just like other industrial sources which normally affect people in an occupational setting, not in their homes) at the levels you are exposed to in Kahuku affects tissues in your body – please do not stay in Kahuku until the Na Pua Makani turbines are shut down. Please watch this video – please do not stay in Kahuku. Until the Na Pua Makani turbines are removed, it's crucial that you move away from Kahuku – even if it's just at night – do not live in Kahuku. Journal entries should you chose to stay near the turbines:
0 (no),
2 (slight – but does not cause any change in behavior or attitude),
3 (moderate – small changes in behavior or attitude, there is a perceived reduction in quality of life but productivity and activity are not affected),
4 (Substantial/Disruptive: The sensation causes a material change in behavior or attitude, reduced interest in getting up in the morning, changes in productivity or activity because of the sensation, changes in schedule including a few hours of sick leave),
5 (Severe/Physically Harmful): Significant changes in behavior, psychological stress or physiological effects – debilitating, taking the day off from work, children taking the day off from school),

Tired? (0, 2, 3, 4, 5) (was it hard to get up or do you feel well-rested; do you feel leaden during the day; do you just make it through your day or are you bright-eyed and ready to go, have a clear mind?). National Geographic Sleep Issue and the Intro to National Geographic Sleep Issue – Chapters 1-2.

Did you dream Y/N? Did you get REM sleep (which is crucial for short-term memory and learning – infants spend 50% of sleep in REM, children need more REM sleep than the 1.5 hours adults need)? REM and deep sleep are part of 90-minute sleep cycles – cycles that can't occur if sleep is disturbed/interrupted by stress response to wind turbine pulses. When turbines were off in January, Kahuku and Sunset Beach residents noticed they were dreaming – For $500, you can buy a personal EEG to monitor REM sleep, and less accurate (but useful because the differences turbines on vs. turbines off/away from turbines is so great, the Whoop, Apple, or similar wristbands that monitor heart rhythm and calculates periods of REM sleep are helpful. Three miles away in Sunset Beach, the low-frequency air pressure pulses from the turbine blades prevent me from getting REM sleep, feeling rested, and feeling short-term memory impacts, so we rented a room in Waialua to sleep in (what impact will this have on affordable housing – if we're all renting a second place to stay).

Dementia: During two periods last year when the Kahuku turbines were shut down for three weeks, I noticed the forgetfulness I've developed (not remembering why I went into a room, forgetting thoughts I had in my work unless I wrote them down, having trouble finding words, not being as able to think clearly), that I

thought was just from aging, went away and my head felt clear. Memory and learning are affected by lack of REM and deep sleep (so if you are not getting the normal three hours of REM and deep sleep – not sleeping through the night – have disturbed interrupted sleep, and dementia is affecting your ability to function normally, write it down).

Wound not healing? Y/N: Have you noticed any wounds that are taking a long time to heal – this may be related to sleep disturbance.

Poor immune response? Y/N: Your immune response to vaccines can be depressed by 50% if you don't get good sleep during the six days after vaccination (not to mention your body's ability to mount an immune response if you get covid 19).

Headache? *(0, 2, 3, 4, 5)* (a few miles away, residents wake up with a stiff neck and headache when the turbines are on – often the headache goes away during the day or when they go to town to work – but some residents have taken disability retirement and now losing their homes because of headaches they didn't even realize were from the turbines. At closer distances, like Turtle Bay, Kawailoa/Chuns/Laniakea/Kahuku, occupants get a headache after an hour of exposure even during the day). HMSA is interested in AES reimbursement for the physical therapy and costly prescription treatments for migraine (see note at bottom of page – Dr. Leah Ridge at Invision building on Victoria near Ward is compiling wind turbine headache patients and will present findings to health departments and Jessica Ho at Central Oahu Physical Therapy is best physical therapist for treatment of stiff neck/shoulders);

Ringing in ears? *(0, 2, 3, 4, 5)* if this is bothersome to you, how bad is it when you wake up each day – does it bother your daily activities (check your medical records – what year was your tinnitus diagnosis – this happens mostly with people who've worked around construction equipment, aircraft, worked in a shop with noise – people who have 10 dB of hearing loss in the very high frequency range on their audio gram). DO NOT use white noise machines to try to mask the wind turbine sound – do not expose yourself to any unnecessary random audible noise other than music (avoid exposure to window AC, fan, surf, highway, and other white noise-like sounds) – soundproof your bedroom so your cell phone sound meter app shows sound does not exceed 35 dBA (you have no chance of masking the air pressure pulses, but at least protect yourself from the learning problems associated with audible noise);

Heart Palpitations? *(0, 2, 3, 4, 5)* Did you have heart palpitations last night – are they more frequent than they used to be (these seem to get more frequent and longer-lasting as years of exposure drag on – unfortunately, sensitization to these wind turbine pressure pulses, occurs rather than habituation – please note these heart palpitations become dangerous when the heart rhythm is permanently altered – my doctor told me not to worry about them (that was years ago when they only happened once a month or so – now that they're every night and sometimes during the day, I'm taking this for them: I'm taking gaia herbs Hawthorn Supreme supplement and it's solved my heart palpitations problem – talk to your doctor because hawthorn can also affect blood pressure – but at least I've solved one of the problems I have being 3 miles from the turbines;

Pressure in ears/ears popping? *(0, 2, 3, 4, 5)* When you're lying in bed are your ears popping when you're not moving your jaw? (this seems to correspond to nights residents get only 30 minutes of REM sleep – if you feel this ear popping, it can help you decide you should find another location to sleep that night if you want to get REM sleep).

Vertigo, dizziness, motion-sickness? *(0, 2, 3, 4, 5)* This occurs within about a mile of the turbines. (If you are feeling this at your home, please move away for the next 10 years while this is resolved – the existing turbines will be decommissioned in 11 years and litigation for the new turbines would take about 10 years). Yesterday I drove up to the elementary school to see how feathered the Na Pua turbine blades were and I was only there for about a minute and I noticed I felt dizzy and I burped (like I do when I visit a wind farm – and this was at an elementary school).

Feeling of fullness or pressure in your head? *(0, 2, 3, 4, 5)* (This often corresponds with ears popping without you moving your jaw a few miles from the turbines – when it's worse, it feels like a headache – neurologists tell me they are migraines, regardless of the pain level – even if it's a dull pain, associated with neck stiffness, it's still apparently classified as a migraine.)

Chest tightness – not taking full breaths/not able to do a full yawn? Y/N (After a few minutes within 3 miles of wind turbines I find my breathing isn't as full). During the day, you can mask the wind turbine low-frequency pulses using wind turbine acoustic specialist Robert Rand's Wavepool bunaural beats – you can't mask 60 dB 1 Hz sound at night because listening to sound higher than 35 dB will adversely affect your sleep. Also try tai chi to help you remember to take full breaths.

Depression – Most of the people who have no choice but to stay in their homes after a wind farm moves in end up on antidepressants – it sounds like many of them also take several prescriptions for various stress-related illnesses. The most effective treatment is to move away from the wind turbines and the symptoms (unless they've caused permanent damage to your organs) will go away after one to three weeks.

If you have children, track the following additional questions:
Children Tired? (0, 2, 3, 4, 5)
Children dreamed last night Y/N? Infants normally spend 50% of their sleep in REM sleep – children also spend a lot of their sleep time in REM sleep.
Children's behavior? (0, 2, 3, 4, 5)
Other:_____ 0-5 (fill in the blank spot for people to add their own symptom to track)

Also note the following:
How Many Hours Were You In Bed, Trying to Sleep: 0-13?
Did you have difficulty falling asleep, getting back to sleep, or premature awakening? Yes/No
Did you leave your home or workplace to seek relief from one or more of these sensations: Yes/No

High Blood Pressure Note to All Residents: Please monitor your blood pressure at home and if you detect high blood pressure, please ask your doctor to confirm it with 24-hour at-home blood pressure monitoring when the wind turbines are on.

Diabetes and Obesity: Please also be aware diabetes and obesity are also related to sleep disturbance. Not only do you not feel like exercising when you're sleep-disturbed, but you will eat more and insulin needs are different.

Tips for sleep:
Take Measurements: If you sleep great, feel rested, dream when you travel but not at home and want to examine your REM sleep and insomnia/inability to fall asleep/fall back asleep in more detail, you*If you decide to stay within 5 miles of a wind turbine, keep a daily journal – track the following on a scale of 0-5 – or for $500 (Dec holiday sale – $300), you can buy a personal EEG to monitor (to track REM and deep sleep) to assess whether you are getting your 3 hours of REM and deep sleep.*

Always ensure you're doing the basics of sleep – no caffeine or alcohol, get sunlight and exercise every morning, use blackout curtains or sleep eye mask, ensure bed noise level is below 35 dBA (use cell phone sound meter), do not try to use white noise machines to mask audible sound – need to block the sound – wear earplugs or noise-cancelling headphones (only work down to 20 Hz), keep bedroom cool temp, no blue light/TV/computer screen 30 min before bed. I know it's not possible to exercise when you feel so tired – no exercise within 3 hours of bed though.

I experimented with supplements for REM sleep like Serenity herbal extracts, Jujube fruit, chamomile, melatonin, ashwagandha, valerian root; I tried sleeping with a CPAP we got for covid (I don't have sleep apnea – Queens sleep lab tested me with an at-home monitor – but I thought it would pressurize my ears so they wouldn't notice the turbine pulses – it didn't work either), I tried sleeping in hammocks in the safe room because I thought the 1 Hz swaying would distract from the turbine pulses – it also didn't work. and I'm

taking L-Arginine because it may prevent development of high blood pressure during this period of REM sleep deprivation. My doctor tried putting me on a couple different sleeping pills/sedatives (that didn't work – neither did gaba (like from kava) – which is a sedative and REM sleep is very similar to being awake, so gaba may be the opposite of what your brain needs) and then we tried an antidepressent for a few months – it didn't work (one out of three nights in the safe room, doing all these things, plus going to bed at 7 and coming out at 8 am and I only eked out 1 hour of REM sleep nine to ten nights per month in July and August, the two months leading up to Na Pua turbines ramping up – and then Na Pua Makani started spinning faster and August tradewinds were unrelenting, so even with the safe room (where sound is the same as outdoors, no resonances like in the house) and all these supplements and prescriptions and spending 12 hours in bed I got 16 minutes of REM and then zero minutes of REM – after putting in all this effort to get sleep – so I gave up and rented a room five miles away downwind from Kawailoa – a place just to sleep (and have exceeded an hour of REM and deep sleep every night since and only need to be in bed for 8 or 9 hours to get all that quality sleep) – having this away place makes me notice my breathing becomes shallow/my chest is tight at home – like it's hard to take a full breath or yawn fully at home (3 miles downwind from the turbines). I'm grateful I traveled for work last year so I could realize how well-rested I feel away from the turbines – I wanted to move to Guam or Rota because I sleep so well there – but my sleep 5 miles downwind from Kawailoa, in Waialua, feels just like my sleep on Rota, CNMI – it's heaven. I know I can't afford to rent a spare bedroom long-term – we'll either get a camper top for our pickup or I'll go back to sleeping in my car in someone's driveway if I can find somewhere safe – maybe the County or State can arrange for a place for wind turbine affected to sleep on their land somewhere safe away from turbines. I am ready to sell our house and move to Kauai where they don't allow wind turbines but for my surfer husband, nothing there compares to our current Sunset Beach home. I know it won't be long before Na Pua Makani is taken down – declared a public health hazard or bought out with taxpayer money – or nuisance noise litigation gets all three wind farms taken down before the end of the 10 years that remain on those things.

October update: I've been reading about enduring torture and I'm interested in seeing if I can teach my mind to accept/ make the low-freqency pulses "your friend". I am going to work with Dr. Lev – He helped a friend of mine, who had chronic untreatable pain come to terms with and live "with" it. If it's possible, I hope to find a way to live in my home rather than rent a spare bedroom in Waialua while these turbine removals are processed.

Tips for headaches: The best doctor for migraines is Dr. Leah Ridge in the Invision building at Victoria near Ward (808) 486-7199. She is interested in compiling the migraine wind turbine patients to submit information to the health departments – she is ideal because she will give you specific forms to use to track your headaches and she is also able to help you get the very best treatments available and the best physical therapist to help you if the turbines are causing stiff neck/shoulders is Jessica Ho in Wahiawa (808) 621-6400. Also if you can afford the out of pocket costs with the risk the wind farm won't reimburse you, chiropractor Bob Kennedy at Paumalu is very skilled and uses the latest/greatest medical muscle relaxing equipment to relax your neck/shoulders – He has package-deals that cost around $65/session.

Night turbine shut down to slightly reduce kills of endangered bats: April – November, turbines are required to be off at night to protect bats when wind speed is less than 5 meters/second (11 mph) (which has been just a few hours this year). Starting December 1, the turbines can be on all night even at the low wind speeds. (I notice this wind speed shutdown for the bats almost never affects the Kahuku turbines – they are unrelenting, on all the time because it's windier there – versus Kawailoa turbines are off many nights because wind speed is lower there/they meet the shutdown wind speed often). Low-frequency sound increases with wind turbine power output (power output increases with increasing wind speed). The best weather station to assess wind speed at both wind farms is the weather station at the James Campbell National Wildlife Refuge by clicking Daily Summary (and viewing the current and previous day) at either Mesowest, Kii weather station or https://raws.dri.edu/cgi-bin/rawMAIN.pl?hiHKII
Note: If you notice you're not taking full breaths because of stress, help your body remember how to take full breaths by doing at least 5 minutes of tai chi every day – here's a link to a free beginner 5-minute tai chi video.
If you find the current wind turbines have affected your health, send confidential health information to: **webmail@doh.hawaii.gov**

More Information About What to Expect:
Here's the simplest graph I can find showing what decibel level of wind turbine low-frequency sound impulses cause humans to say they are severely impacted ("5", severe impact, red squares, and "2", blue squares is reported slight effects that don't impact behavior). This graph is from a study of homes within 1,600 meters of turbines, Cape Bridgewater, Australia).

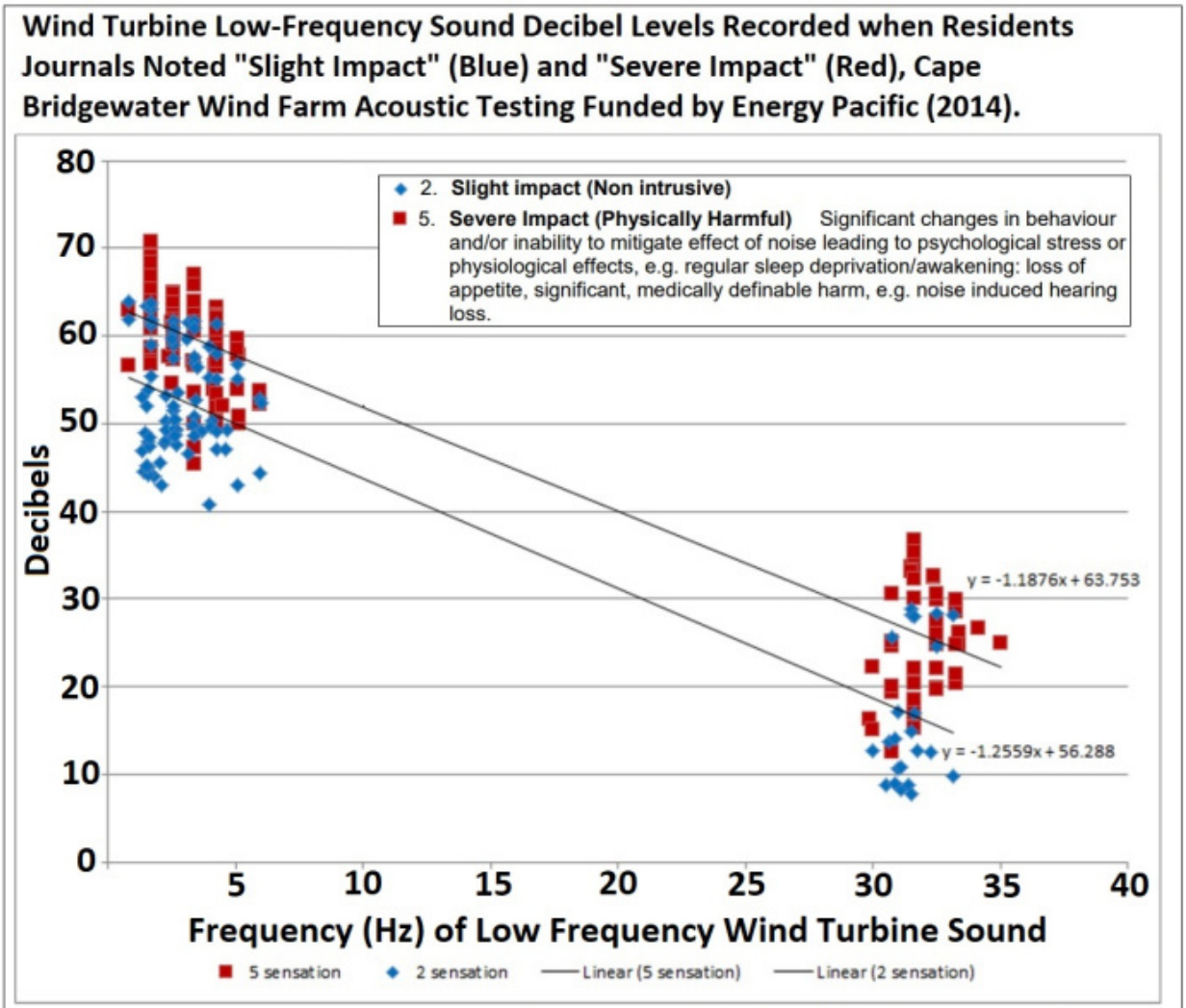


FIGURE 49: Human response to sound pressure of wind turbine signature and 31.5 Hz wind turbine amplitude modulation (both do not occur in the ambient environment) https://drive.google.com/open?id=180jlKaO_Z9pdWpQ64z8EFEh1vYdiqqrp

Kahuku is currently experiencing 63 dB of 8 Hz sound from the 2.5 MW turbines (and the Na Pua Makani turbines would cause 8 Hz 83 dB – 83 dB is not even on this graph, it's so high). Na Pua Makani would increase sound pressure pulse levels everywhere but we don't know by how much because these large turbines have not yet been measured anywhere in the world (by anyone willing to provide the data).
An estimated 10 to 30% of residents within 4.2 miles are presumably affected by the low-frequency sound pressure pulses. These are normal people, not just people with autism and seizure disorders.

Table 3: Baseline conditions and core symptom occurrence*

	Total	Male	Ages	Female	Ages	N**	% of sample
Baseline Conditions							
Serious medical illness†	8	2	56–64	6	51–75	38	21
Mental health disorders‡	7	3	42–56	4	32–64	34	21
Migraine disorder	8	4	19–42	4	12–42	34	24
Hearing impairments	8	6	32–64	2	51–57	34	24
Pre-existing tinnitus	6	4	19–64	2	33–57	24	25
Previous noise exposure	12	9	19–64	3	33–53	24	38
Motion sensitivity	18	10	6–64	8	12–57	34	53
Core Symptoms							
Sleep disturbance	32	17	2–64	15	2–75	36	89
Headache	19	8	6–55	11	12–57	34	56
VVVD◊	14	6	32–64	8	32–75	21	67
Dizziness, vertigo, unsteadiness	16	7	19–64	9	12–64	27	59
Tinnitus	14	9	19–64	5	33–57	24	58
Ear pressure or pain	11	6	2–25	5	19–57	36	30
External auditory canal sensation	5	2	42–55	3	52–75	34	15
Memory and concentration deficits (salient+mild/vague)	28	15	6–64	13	5–57	30	93
Irritability, anger	28	15	2–64	13	2–64	37	76
Fatigue, loss of motivation	27	14	2–64	13	2–75	36	75

*A symptom during exposure is defined as distinctly worse for that individual during exposure compared to before and/or after exposure.
**N=number of subjects in which it was possible to know about the condition or symptom, given age and other specific limitations (see p. 41 and subsequent text).
†See p. 42 and Table 2.
‡See p. 42 and subsequent text for definitions of this and other conditions and symptoms.
◊Visceral Vibratory Vestibular Disturbance: See pp. 48 and 55ff.

Sunset Beach sound pressure levels typical of high wind, low wind, and turbines off are shown below. High wind 55-60 dB at 1-3 Hz at Sunset Beach I get zero to 16 minutes of REM sleep; low wind, I typically get 30 minutes of REM sleep, turbines off I typically get 1.5 hours of REM sleep (here at Sunset Beach, three miles from the Kahuku Wind Farm turbines):

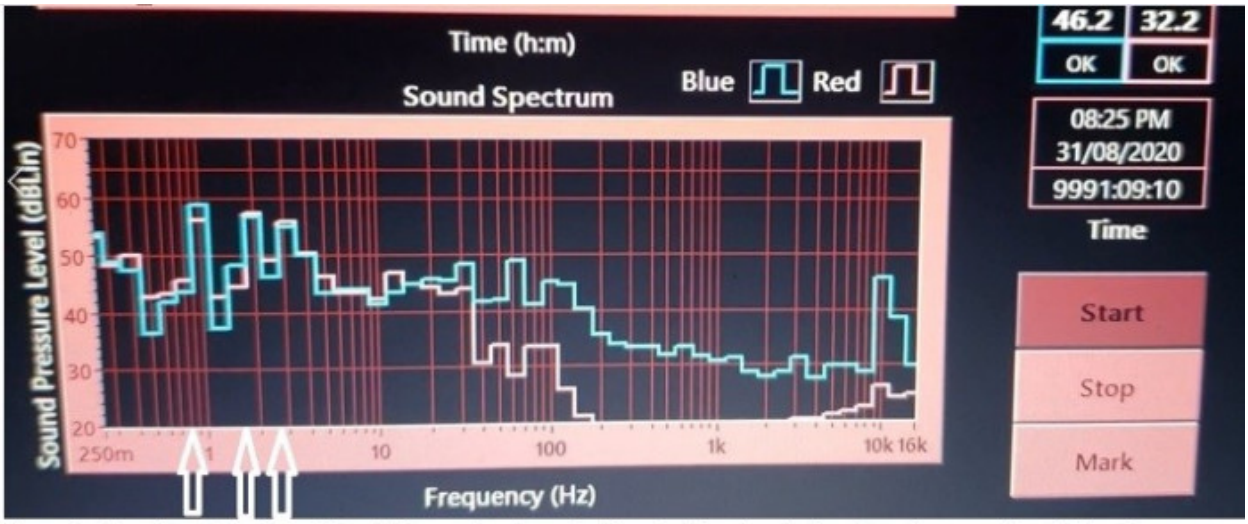


Figure A. Blue microphone Sunset Beach (three miles downwind from turbines), red microphone in garage "crypt" sleeping area (which does nothing to block 1 Hz, 2 Hz, and 3 Hz low-frequency air pressure pulses "low-frequency sound pressure" registering at 55 60 dB (see white arrows). Winds were 18 MPH, gusts to 26, from the east (92 degrees).

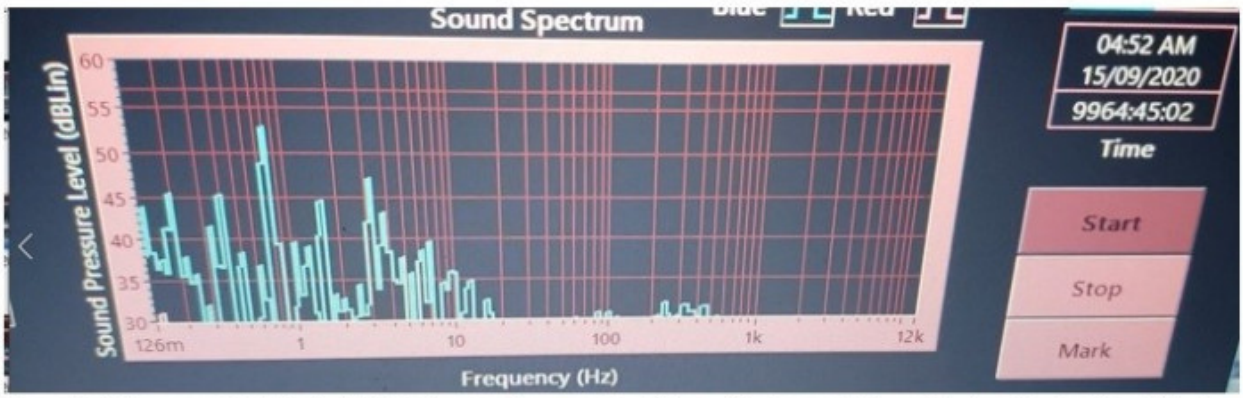


Figure B: Turbines on with light wind. This is the sound pressure level three miles downwind from Kahuku with about the lightest winds the turbines are allowed to operate during April through October nighttime (James Campbell Weather Station: winds 10, gusts to 13, 99-degrees/East wind). This 50-55 dB 1 Hz signal (and its 2 Hz and 3 Hz harmonics.

We assume that now that the health effects are known to the public, the existing turbines will be required to shut down before their scheduled decommissioning dates, 2031 and 2032.

Sunset Beach Community Association
P.O. Box 471
Haleiwa HI 96712

01.16.2020

Honolulu City Council
Honolulu Hale
530 South King Street, Room 203
Honolulu, Hawaii 96813

Dear City Council Members,
The Sunset Beach Community Association is writing in support of City and County Resolution 19-305, proposing a Land Use Ordinance Amendment to Change the Setback of Wind Turbines to Five Miles from Surrounding Boundary Lines.

In addition, the two existing North Shore wind farms should be required to shut down at night to avoid killing endangered bats, consistent with state endangered species law. This night shutdown will also reduce adverse health effects to our residents resulting from the wind turbine operation.

Sincerely,
Andrea Woods
Andrea Woods
Corresponding Secretary
Sunset Beach Community Association

cc: Councilmember Tsuneyoshi
Honorable David Ige, Governor
Mayor Kirk Caldwell
North Shore Neighborhood Board
Senator Gil Riviere
Representative Sean Quinlan

Nighttime shutdown of the turbines, to prevent the turbines from killing endangered bats, will reduce the wind farm's nuisance noise-harm. The wind farm would gross approximately $10 million/year with their $0.15/kwh power purchase agreement, so they can afford to shut down 45% of the time, at night, to conserve the bats (and the town). The State of Hawaii Board of Land and Natural Resources (the same Board members who had just approved the Thirty Meter Telescope on Mauna Kea), who are entrusted with managing this State land to benefit Native Hawaiian people, approved the Na Pua Makani Wind Farm on State land, even though they could have (as pointed out by Keep the North Shore country and Kahuku Community Association in their contested case hearings, as recommended by the State's attorney) required the nighttime shutdown as required by state endangered species law.

Of the noise aspects of this project the National Wind-Watch.org said "The closeness of this project to homes and a school should worry officials (or they should be made to worry). They should review the nuisance case of Falmouth Massachusetts, where first, the turbines had to be shut down at night to allow the neighbors to sleep, and finally shut down completely, costing the town many millions." (Wind Turbine Noise Health Effects).

This is our Mauna Kea – We are Mauna Kea. Kū Kia'i Kahuku – A'ole wind turbines. The injustices of this Board of Land and Natural Resources against Native Hawaiians are startling.

September 11, 2019 Update: Last night the wind developer offered to pay $4 million or something for a rec center and pool that the City/County is already working on funding regardless of the wind farm – got zero applause – met with silence (just like Kahuku is going to stay because these things are not going to be built). The residents of Kahuku do not want to move away so they can have a safe place to live – in 12 years the existing Kahuku Wind Farm will be removed – and we can't imaging the prospect of a new wind farm that would last another 20 years. If we could all pick up and move to a safe place and just be reimbursed for our property value losses, that would be one thing (it would cost the wind farm more than they would gross in 20 years to pay us, but it could be done) – however, we don't want to move – families have deep roots to this place – the Kahuku, Laie, and Sunset Beach areas are high and dry, safe from sea level rise. Kahuku has affordable housing – where do you expect us to move to if you keep building wind turbines up here? We believe we can shield 40 decibels of low-frequency sound with 1 meter thick sandbags – so we think we can build structures to sleep in when the wind turbines are on for the next 12 years. But if you're going to force this new wind farm on us, what are we going to do?

Na Pua Makani SFEIS fails to disclose to Federal, State, and County permitting agencies how noisy the wind turbines will be, situated so close to residential areas. Na Pua Makani's EIS says there would be ***"no high or adverse effects to any minority or low income population and, therefore, no environmental justice issues resulting from this Project."*** According to the Census Bureau, Kahuku has a total population of 2,614 people in 622 housing units (53% owner-occupied; 47% renting) that are 8.6% (224) white, 34% (888) Native Hawaiian; 26% (641) Filipino, and 31% (823) two or more races, 62% born in Hawai'i, 23.5% born in foreign country. Twenty five percent of the of population 25 years and older did not graduate from high school; 53% of Kahuku residents completed no more than 8th grade.
Video of sign-waving prior to meeting with AES in Laie, Sept 10, 2019
Video of misleading presentation by AES and community voicing concerns September 10, 2019

Video interviews and testimony by residents in Massachusetts, the midwest, New Zealand, and Australia describing effects of wind turbines on their health,and 2019 NY State hearings addressing protection of public health from wind turbines:
Falmouth, MA, 2012 Board of Health public hearing testimony by people living within a mile of two 1.65 MW turbines – the turbines had just been shut down at nighttime – and after this hearing, the turbines ended up being removed permanently: Falmouth, MA, 2012 Board of Health Public Testimony
Video: https://www.youtube.com/watch?v=5rguPxQ93Qc&fbclid=IwAR3VITCbpzZdGHkGzucE0H0Kt49JpvKnAIr38i3rny8pLOQL_PxHiFkGsqg
Video of residents explaining health effects of wind turbines up to 2.8 miles away, in Australia and New Zealand: https://www.wind-watch.org/video-pandora.php
September 10, 2019: New York Wind Turbine Setback Hearings: https://www.wind-watch.org/video-lincoln-ny.php where Jerry Punch presents a **summary of decades of research regarding health effects of wind**

turbines: https://docs.wind-watch.org/Punch-James-Wind-Turbine-Noise-16-09-30.pdf and in Robert Rand, Rand Acoustics talk, infrasound discussion starts around 20:00 and he explained people who are sensitized to wind turbine noise can't live within four miles of wind turbines.
2019 Iowa County proposes 1.5-mile setback from farm dwellings (all residences, not just residential-zoned areas): https://www.desmoinesregister.com/story/money/agriculture/2019/08/27/midamerican-proposed-turbine-setbacks-would-wipe-out-wind-development/2132245001/
Video showing infrasound noise equipment and results near wind farm in the midwest: https://www.youtube.com/watch?v=ibsxVKU6B8s&feature=youtu.be&fbclid=IwAR2n93wZFMTn-T_4HtscKrfwHqre-7LVqIVMkVhfIGhyxe7_yM5wXq1jaz4
Recommendation to keep wind turbines 10 km (6.2 miles) from homes: https://www.youtube.com/watch?v=IEh3sooKU8A&feature=share&fbclid=IwAR3h1gUjAjJzQNH5G_-_2RUmGBi3IPAgQATJkd6z6_jd4x6JDCfwdnPzKRU

More Details about Endangered Bat Litigation
Endangered Bats: To get a license to kill an endangered animal, endangered species law requires the project to offset take of the endangered species with mitigation to the "maximum extent practicable". This is relatively easy to do for most species – you can boost Hawaiian goose and Hawaiian seabird reproductive success from 5% to 80% by protecting nests from cat, mongoose, and rat predators. Back in 2009-2012, when the incidental take licenses for the first five Hawaii wind farms were issued, it was totally reasonable for the DLNR to conclude the solitary tree-roosting bat population would increase if 20 acres of grazed grassland was restored to native forest. Researchers thought bats preferred native forest and they thought the core area used by a bat was 20 acres. But in 2016 monitoring at a wind farm mitigation site on Maui showed a reduction in bat feeding when pigs are removed possibly because the dung beetle population declines. In addition, it turns out bats prefer foraging in non-native grasslands, low-density developed areas, and gulches; the bats fly over native forest areas to get to these other feeding sites; and the average male bat core area is 9,143 acres (3,700 ha), not 20 acres (Bat Core Area Research). So removing pigs from 1,300 acres of native forest for 8-12 years does not offset take of 51 bats by Na Pua Makani. It's more likely to hurt bats. Na Pua Makani's HCP, that the DLNR approved to authorize the wind farm killing 51 bats, would "mitigate"/"offset" the kills by funding eight to 12 years of pig removal and grass removal in 1,300 acres (526 ha) of native forest at the Poamoho Ridge native forest area and $150,000 in "research" to monitor the bat population at Poamoho Ridge during that time. The problem is, the proposed mitigation will not help bats because A.) removal of pigs, grass, and other non-native plants at Poamoho Ridge would not be expected to help even one bat because bats feed preferentially in grassland and areas occupied by pigs; B.) the "mitigation" site was already fenced by DLNR and the Watershed Partnership; and C.) the 1,300-acre mitigation site is the size of one seventh of one male bat's core area, so how would 51 additional bats be produced by the small densely forested site to offset the wind farm's bat take? The bat take license may have been approved because it will help the DLNR meet its own internal acres managed goals (they want to have 20% of DLNR pig-free by 2020 or something like that – because pigs damage native plants and their rooting causes mosquito populations to increase, so the forest birds get malaria – pig control is a high priority for other Hawaii species – but it clearly does not help the bats).

By law, Hawaii wind farms including Na Pua Makani must avoid bat take by shutting down at night, to the extent if is practicable (financially feasible), until an effective bat mitigation method is developed and the wind farm implements it to offset their bat take. According to information provided by HECO, Na Pua Makani would gross more than $10 million/year while wind farm operations (which wouldn't include the bat mitigation costs) cost approximately $2 million/year. Nighttime shutdown would reduce gross income by approximately 45% ($6.5 million gross, minus $2 million operating cost = $4.5 million PROFIT). Even with the nighttime shutdown (which brings the wind farm into conformance with State noise laws and endangered species laws), Na Pua Makani, because of their generous $0.15/kwh power purchase agreement, would roll in the $4.5 million per year profit. The two new Hawaii wind farms are both proposing $0.10/kwh power purchase agreements, even in light of the nighttime shutdown requirements. Massive profits at the expense of endangered bats (and the Kahuku public trying to sleep at night) are unlawful.

Na Pua Makani is the first wind farm proposed since the new information about the ineffectiveness of bat mitigation became available. After eleven years of industrial wind farm operations in Hawaii, there is no evidence a single bat has benefited from a wind farm mitigation project and it's more likely mitigation is harming individual bats and bat populations.

To Avoid Killing Endangered Bats, Na Pua Makani Must Shut Down at Night: Na Pua Makani proposes to minimize bat take by implementing low wind speed curtailment when wind speeds are 5 meters/second or lower at night (stopping blade spinning when winds are lighter because bats are flying under light wind conditions). However, new research indicates the relatively large, strong-flighted Hawaiian hoary bats are still flying around wind turbines at existing North Shore wind farms up to wind speeds of 12 m/s (Figure 1, adapted from Gorresen et al 2015, Figure 19, p. 25 https://dspace.lib.hawaii.edu/bitstream/10790/2585/1/TR64_Gorresen_Bats_Final.pdf).

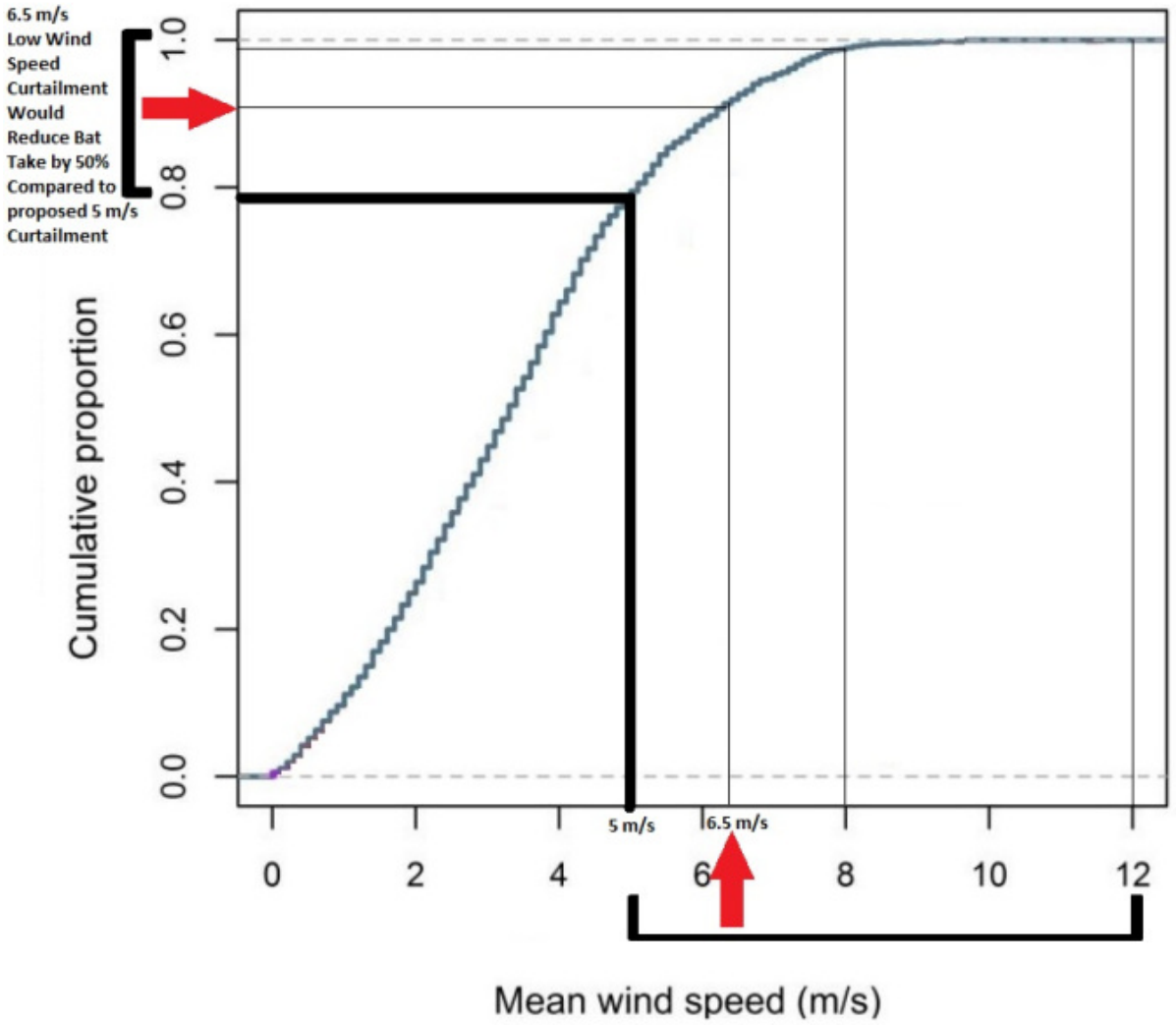


Figure 1. The relatively large, strong-flighted Hawaiian hoary bats are detected flying around wind turbines at existing North Shore wind farms (blue curve) at average wind speeds up to 12 meters/second. By implementing low wind speed curtailment of 6.5 m/s (red arrows) instead of the proposed 5 m/s, Champlin could reduce bat take by 50%. Low wind speed curtailment at 8 m/s would almost eliminate bat take. Graph adapted from Gorresen et al 2015, Figure 19: https://dspace.lib.hawaii.edu/bitstream/10790/2585/1/TR64_Gorresen_Bats_Final.pdf

Video of the DLNR Contested Case Hearing

Status of Permit Applications: Keep the North Shore Country addressed the endangered bat aspects of the project in a contested case at the DLNR, with hearings held August 7 and 8, 2017. On November 1, 2017, the DLNR's contested case hearing officer Yvonne Y. Izu, Esq. recommended the Board of Land and Natural Resources deny the Na Pua Makani Wind Farm's application for an incidental take license Hearing Officer Recommends Board Deny License. Without fixing the fatal flaws such as requiring the wind farm to shut down to avoid bat take, the Board of Land and Natural Resources approved the wind farm's permit on May 15, 2018. Keep the North Shore Country has appealed this decision in State court. The Circuit Court does not have the authority to overturn Agency decisions, so the case is now at the State Supreme Court awaiting hearing.

If these Na Pua Makani Wind Turbines are built, they will be removed via class-action litigation, just like the two 1.65 MW turbines the town of Falmouth, Massachusetts installed in a residential area (2012 Falmouth, MA Hearing) wind turbines were. We have rights.

Gmail

Testimony BOE <testimony.boe@boe.hawaii.gov>

Testimony is Support for agenda item II.A. Sunny Unga's Petition No. 20-01.

1 message

Sunny Unga <sunnyrkim@gmail.com> Wed, Jan 13, 2021 at 8:44 AM
To: testimony.boe@boe.hawaii.gov

Dear Board Members,

My name is Sunny Unga and I am the petitioner of this rule change and I would like to share with you what inspired me to ask each one of you today to support my petition for rule change.

As a mother with children attending Kahuku Elementary, I became gravely concerned regarding the close proximity of these turbines to my children's school and how it would detrimentally impact my child's safety, health and learning environment at school. I did everything possible to raise my concerns along with our community to the school administrators and the BOE to no avail. Here are some examples:

I first raised our concerns to the principal of our school in a school meeting. We were informed to email our concerns to him and our complex superintendent. Our community decided to do a letter writing campaign and submitted letters and emails as advised but no one responded. In fact, the complex superintendent sent out emails to the school to remain neutral and to not discuss these issues at school instead.

I decided to go up the ladder and contacted the BOE office. I was informed that the BOE meeting was not the appropriate forum to bring up my concern and was informed to contact Superintendent of State of Hawai'i Public Schools Christina Kishimoto and BOE Chairperson Catherine Payne.

Our community went to the BOE's office to submit parent letters to Kishimoto's office as advised. However, BOE office's personnel informed us that she would not deliver the letters to Kishimoto but to our area complex superintendent instead despite our explanation that we had already submitted letters to him but did not receive a response and that the BOE office advised us to submit our concerns to Kishimoto. So again, our efforts to reach out to the DOE was unsuccessful. We were informed that we would get a courtesy call from our complex superintendent but we have not heard back. I personally tried to set up a time to meet with our complex superintendent but was not allowed to schedule a meeting with him.

I attended our School Community Council to request the board to raise these issues on behalf of concerned parents to the BOE. However, the board was hesitant to write this letter because of the instructions given by the complex superintendent to remain neutral and to not discuss controversial issues. It was only when the student rep cried and expressed her experience and support for writing this letter, did the board decide to write the letter. However, I haven't received confirmation of this letter.

You may ask why I am sharing these lengthy experiences. It is to inform you that there is no existing process in place for a parent and a community to raise legitimate concerns and be heard. We tried everything we could possibly do and we are still hoping that the school administrators and the BOE will hold a meeting in the near future with the parents of Kahuku Elementary, Intermediate, and High school to learn about our parents' concern regarding this project near our schools and address them.

The process shouldn't be this challenging and time consuming. We can change how we do things from here on out for other schools and communities and this is what inspired me to file this petition for rule change. We need a better process for parents to raise issues regarding their students learning environment, safety, and

wellbeing on school campuses. We must create a process that would allow the administrators to be in tune with what's happening on school grounds and its community. This will allow the DOE to become aware of parents' concerns and provide an opportunity to address them early on in the process. Consulting parents and the affected communities and reflecting their voice and concerns prior to making any official comment is the step in the right direction. Please be an advocate for our keiki by supporting this petition for rule change for it will only better protect our keiki's learning environment at school, health, and safety.

Mahalo!

*I included an attachment in this email of the timeline of my efforts for your reference.

SunnyUngaBOETimeline.pdf
49K

Timeline:

September 9, 2019: At the talk story event with Kahuku Elementary School Principal and I brought up my concerns in regard to the wind turbines and how that would impact the health, learning environment, and safety of our children. I was informed that parents could email the principal and Complex Area Superintendent Matt Ho (CAS Ho) regarding our concerns. The Principal also assured me that he would relay our concerns to CAS as well.

September 2019: After the meeting with the principal, we started a letter writing campaign. Concerned parents wrote letters and emails to thepPrincipal and CAS Ho. As of this writing, we have not received a response from CAS Ho or a member of his office.

October 21, 2019: Complex Superintendent sends an email to faculty and staff of Kahuku. Staff and faculty of the school expressed to me that they were informed to remain neutral and avoid discussions on the NPM wind project at school or with students.

October 28, 2019: I contacted the BOE office regarding my concerns with the wind turbines. I was informed that the BOE meeting was not the appropriate forum to bring up my concern and was informed to contact Superintendent of State of Hawai‘i Public Schools Christina Kishimoto (Kishimoto) and BOE Chairperson Catherine Payne (Payne).

Email from BOE Office:

“Aloha,

Thank you for contacting the Board of Education with your concerns regarding the land surrounding Kahuku Elementary. As explained over the phone there are many State and County agencies involved in and around the land in which the turbines are being installed. We encourage you to advocate for your community concerning the wind farm. However, the Board of Education is not an appropriate venue to address this issue on an upcoming agenda. It is our understanding that you have contacted your Legislators and City Council members and also seek a response from the State Superintendent of Public Schools. I have identified the e-mail addresses that would be most appropriate to send your concerns to below.

Christina Kishimoto, PhD
Superintendent of State of Hawai‘i Public Schools
doe_info@notes.k12.hi.us

Catherine Payne
Board of Education Chairperson
boe_hawaii@notes.k12.hi.us

Regards,
Board of Education Office"

December 20, 2019: I made copies of the previously written parents' letters from September and a friend of mine helped by going to Kishimoto's office at the BOE to submit them as advised by the BOE office. In addition, we submitted a letter addressed to Kishimoto titled "RE: imminent peril to the public health of the Ko'olauloa communities of Oahu" from Ku Kia'i Kahuku. She asked the assistant at Kishimoto's office to give all of these letters Kishimoto. However, one of the BOE office's personnel by the name of "Darayln" said she would not deliver the letters to Kishimoto because the concerns addressed within the letters were about Kahuku Elementary School and that the letters should instead be submitted to CAS Ho. Notwithstanding our explanation that we had already submitted letters to CAS Ho and did not receive a response and that the BOE office advised us to submit our concerns to Kishimoto, "Daralyn" insisted that she would not give the letters to Kishimoto, but would send them to CAS Ho. "Darayln" stamped the letter and informed us that we would get a courtesy call from CAS Ho when he received the package of letters. As previously noted, we have not heard from CAS Ho.

January 8, 2020: I called CAS Ho's office to make an appointment to meet with him and talk about our concerns as parents. One of CAS office's personnel by the name of "Cheryl" informed me that he was out of the office and asked what this meeting was for. I explained that I wanted to meet with CAS Ho to discuss our concerns about the wind turbines and "Cheryl" said she would first need to confirm with CAS Ho before scheduling an appointment. I followed up a few days later with the CAS office and CAS Ho was still out of the office. I last followed up on January 15, 2020, and I was again informed that he was still unavailable and no follow-up call was given.

January 15, 2020: I went to the BOE office to file my petition for rule change. The rule states that in order to file a petition for rule change such a petition must be filed with the chairperson. Accordingly, I went to the BOE office to file my petition. However, I was denied entrance to the BOE office. Upon arrival, a security guard at the entrance who asked for my ID. I presented my ID and thought I would be able to go into the BOE office. He asked who I was going to see to which I responded, "Catherine Payne," who is the BOE chair. He said that Catherine Payne was not in her office and because of that I wasn't allowed to go up. I asked if I could see some other BOE personnel and he said that I couldn't enter unless I had an appointment or the name of the person we were meeting and an office number. He wouldn't allow me to go up fearing that I end up "wandering around." It was only when I called the BOE office and explained the situation did the BOE office send down Gina, the executive assistant to the BOE, to meet us at the security checkpoint. The executive assistant related that although she is not the right person to submit the petition to she would help get it to the right person. I asked if they could time stamp my copy of the petition, but the executive assistant only promised to send a confirmation email (which after me having to follow up was finally completed).

February 1, 2020: I met with Senator Gil Riviere and asked if he could help coordinate a community meeting with Kishimoto, Payne, Kahuku schools' administrators and CAS to discuss the community's concerns. I emphasized that we had reached out numerous times and in various ways to the BOE and CAS but had not been successful in getting a response back from CAS Ho or the BOE. I hoped that he would be able to coordinate a meeting to provide an opportunity for our community to address our concerns and be heard. In addition, I hoped that this would also give the BOE and CAS an opportunity to visit Kahuku Elementary and Kahuku High and Intermediate School and see for themselves how large and near these industrial turbines are to our schools. Senator Gil told us that he would help us coordinate this meeting.

February 11, 2020: I requested to be on Kahuku Elementary School's School Community Council (SCC) agenda to talk about our communities' concerns. The principal obliged and put me on the agenda of the SCC's February 11, 2020 meeting. I testified about my concerns regarding the windfarm. I also expressed concern about the school remaining silent and unwilling to advocate for our students on an issue that effects their student's safety and learning environment. I requested that the SCC write an official letter to the BOE/DOE expressing our community's concern. I was told that the school was instructed to remain neutral and to avoid discussions on controversial topics. The principal stated that he had done his best to relay our emails and concerns to his chain of command and the DOE. The SCC deliberated and only after the student rep cried while expressing her thoughts about her experience and desire to support this letter did the board decide to write this letter. I have not heard regarding the status of the letter yet.

Gmail

Testimony BOE <testimony.boe@boe.hawaii.gov>

WRITTEN TESTIMONY Special meeting January 14

1 message

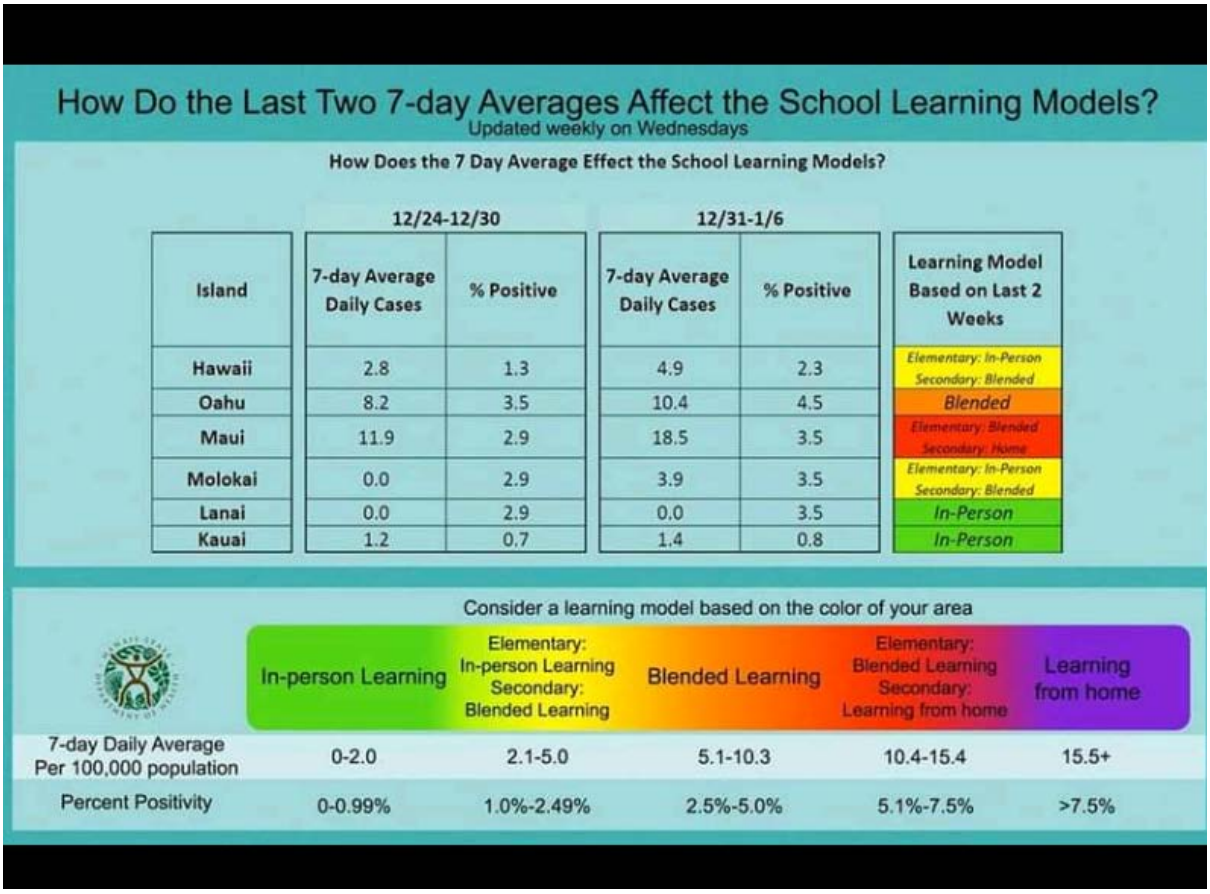
Susan Pcola-Davis <susanp60@yahoo.com> Wed, Jan 13, 2021 at 7:01 PM
To: "Testimony. BOE@boe. hawaii. gov" <Testimony.BOE@boe.hawaii.gov>

Susan A. Pcola-Davis
Written Testimony Special Meeting January 14, 2021
Comments on current COVID metrics for schools

I know it is late. As you said, they will read it anyways.

In light of the recent upsurge of positive cases, we may want to re-look at the DOH metrics for schools!

About.docx
1125K



This Source CONTRADICTS Hawaii's data that supports school reopening decisions!

Source: https://covidactnow.org/covid-risk-levels-metrics

DAILY NUMBER OF NEW CASES:

If number of new cases daily is > 75, SEVERE OUTBREAK

7 DAY AVERAGE

If number of cases average daily/100,000 is > 1.4 then COVID is Increasing exponentionally!

POSITIVE TEST RATE

Positive test rate is the percentage of COVID testing that comes back positive

(not the total number of positive tests).

Hawaii metrics definition. The testing positivity rate is defined as the percentage of all tests reported that are positive. Tracking percent positivity

along with the number of new cases is important in understanding how the virus is spreading in the community.

> 20% inadequate testing

10-20% high, at risk of outbreak

3-10% Medium, slow growth

< 3% adequate testing [BEST PRACTICE: < or = 1%]

Christopher Case just came out. Should change. Idk if it will.

How COVID risk is determined

Daily new cases

Infection rate

Positive test rate

ICU capacity used

Tracers hired

How COVID risk is determined

What does the overall risk level for a location mean?

A state or county's overall risk level takes into account three metrics: daily new cases per 100K (incidence), infection rate (Rt), and test positivity.

(1) Daily new cases, also known as "incidence" in epidemiology, represents the current amount of COVID in a community.

(2) Infection rate is the direction and speed of growth. For instance, daily new cases may be low, but if infection rate is high, then we know that daily new cases will be high in the near future.

(3) Positive test rate is a measure of our confidence in the underlying data. For instance, if daily new cases and infection rate are both low, but test positivity is high, then the lack of sufficient testing

suggests that we are not capturing the true levels of COVID and both daily new cases and infection rate are actually higher than what is currently reported.

Each metric is graded green, yellow, orange, or red. Incidence is the only metric for which there is a dark red, a color we added after the third surge in winter 2020, in order to capture unprecedented case counts.

If a region's daily new cases is green, then its overall risk level is green. For instance, if the daily new cases metric is green, but test positivity is yellow, the overall risk level is still green. Otherwise, a region's overall risk level reflects the highest risk level across all three metrics. For instance, if daily new cases and test positivity are both yellow, but infection growth is orange, then the overall risk level is orange.

The end goal is for regions to reduce cases to zero, to fully reopen their economies, and for people to resume normal lives, unrestricted by COVID or containment measures.

Severe

Severe outbreak

Critical

Active outbreak

High

At risk of outbreak

Medium

Slow growth

Low

On track for containment

Daily new cases

Daily new cases is the number of new COVID cases per day per unit of population (we measure per 100K people).

Over 75

Severe outbreak

25 - 75

10 - 25

1 - 10

Under 1

On track for containment

Why do you not call it incidence?

The term “daily new cases” tells you exactly what is happening: There were 100 daily new cases per 100K. Incidence, which is more commonly expressed as a rate, can be confusing.

How can daily new cases be looked at alongside infection rate?

The infection rate answers the question: “on average, how many new people will one person infect while contagious?” Daily new cases answers the question: “how many new COVID infections are in my area today?” The two metrics go hand-in-hand.

A community heading towards an outbreak has a high infection rate, but a low number of daily new cases. The number of daily new cases per 100K will grow in the coming days because of the high infection rate.

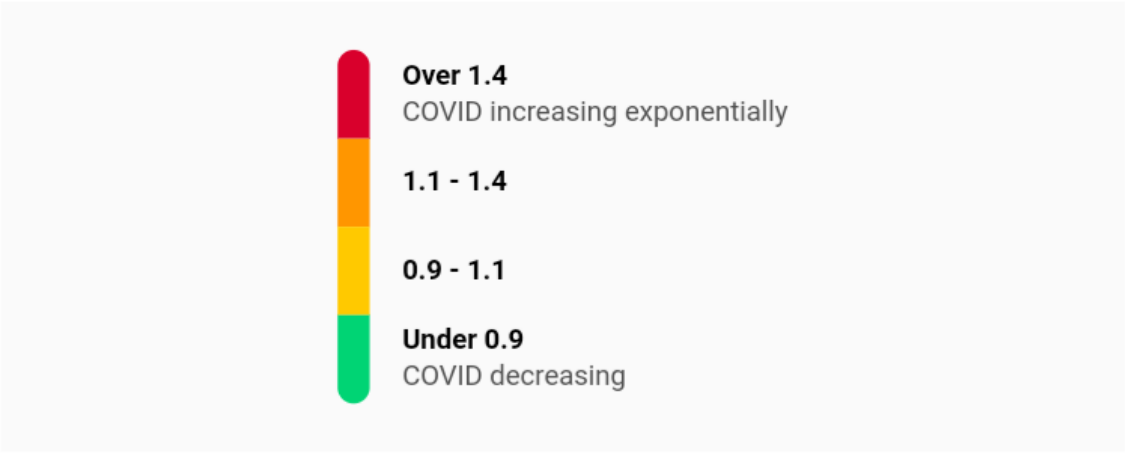
In contrast, a community recovering from a major outbreak has a high number of daily new cases. However, with fewer people testing positive than in the weeks prior, the infection rate is declining. Because its infection rate is less than 1, the community’s incidence should continue to drop.

What are your sources and methodology for daily new cases?

When calculating daily new cases, we look at the average cases per 100,000 people in a location, which is calculated as a seven-day average of daily new

$$\text{Daily new cases 100k Population} = \frac{\text{New daily cases (average of last 7 days)}}{\text{Population / 100,000}}$$

cases, divided by the population, divided by 100,000.



Why is infection rate important?

Infection rate, also known as R(t) or "R-effective," is important because it estimates how fast COVID is spreading right now.

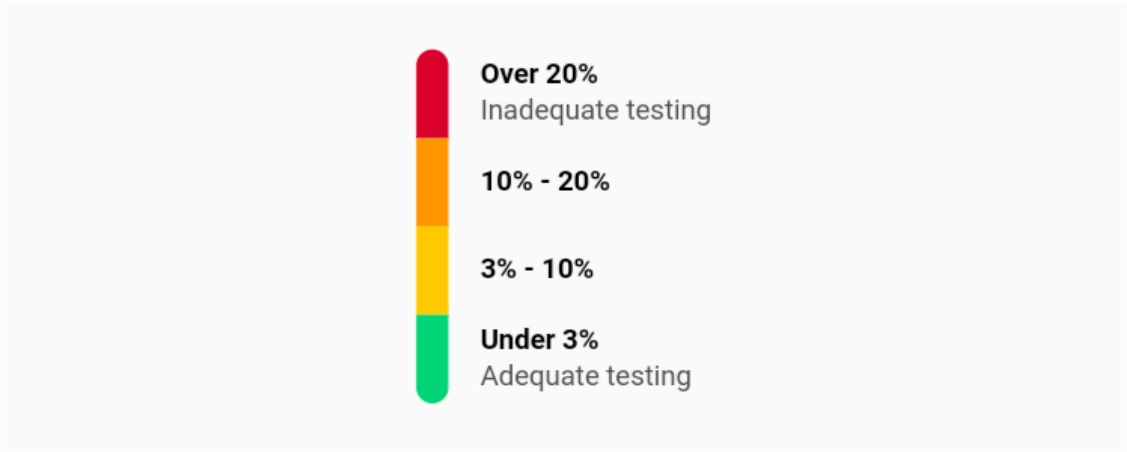
To give an example, if the R(t) is 3, it indicates that one infected person will most likely infect three other people, and those three people will each go on to infect three more people. We as a community can change it by modifying community behavior (whether there are large gatherings) and intervention practices (whether people wear masks and maintain social distancing).

What are your sources and methodology for infection rate?

In order to control COVID, the infection rate, or R(t), must be driven below 1.0 until the daily new cases metric is green. At that point community spread is effectively stopped and we can focus on controlling isolated outbreaks. We use 0.9 as the cutoff for a green score because at that rate the number of newly infected people begins to significantly decline. An R(t) of 1.0 means that the daily new cases of COVID are stable, while an R(t) greater than 1.0 means that daily new cases are growing.

Positive test rate

Positive test rate is the percentage of COVID testing that comes back positive (not the total number of positive tests)..

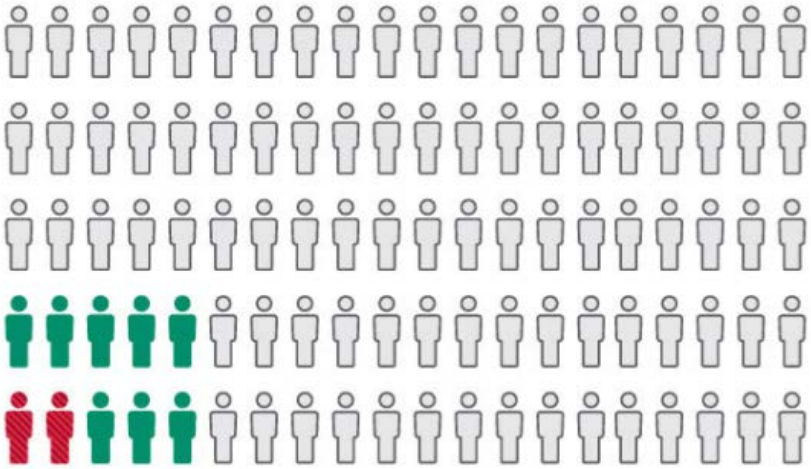


Why is positive test rate important?

Positive test rate, also known as test positivity, is a good indicator of how widespread testing is in a given area. If a state or county has a high positive test rate, it is a sign of insufficient testing in that area. If a state or county has a low positive test rate, it is a sign that we are testing more than only the sickest people. Testing a larger number of at-risk populations (essential workers, people notified via contact tracing , etc.) is key to catching unknown infections before they can lead to an outbreak.

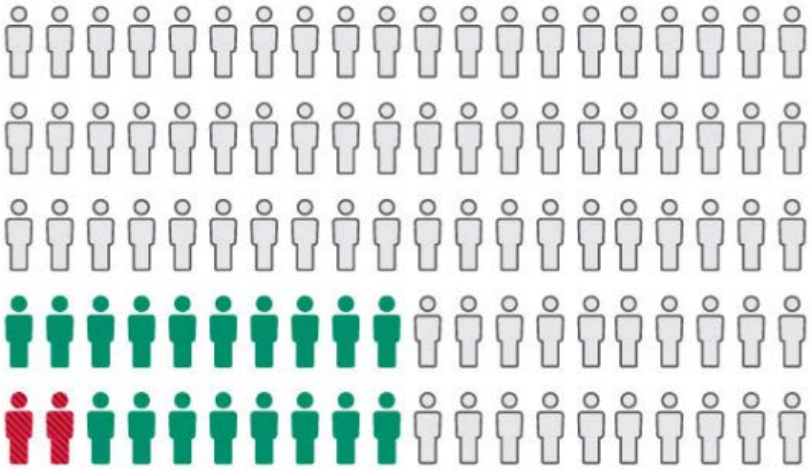
Let's look at the pictures below. There are two positive COVID tests in each of these scenarios, but the positive test rate differs drastically due to the percentage of the population that is being tested. The closer we get to testing everyone, the less likely we are to miss positive cases.

TP = 20%
Insufficient testing

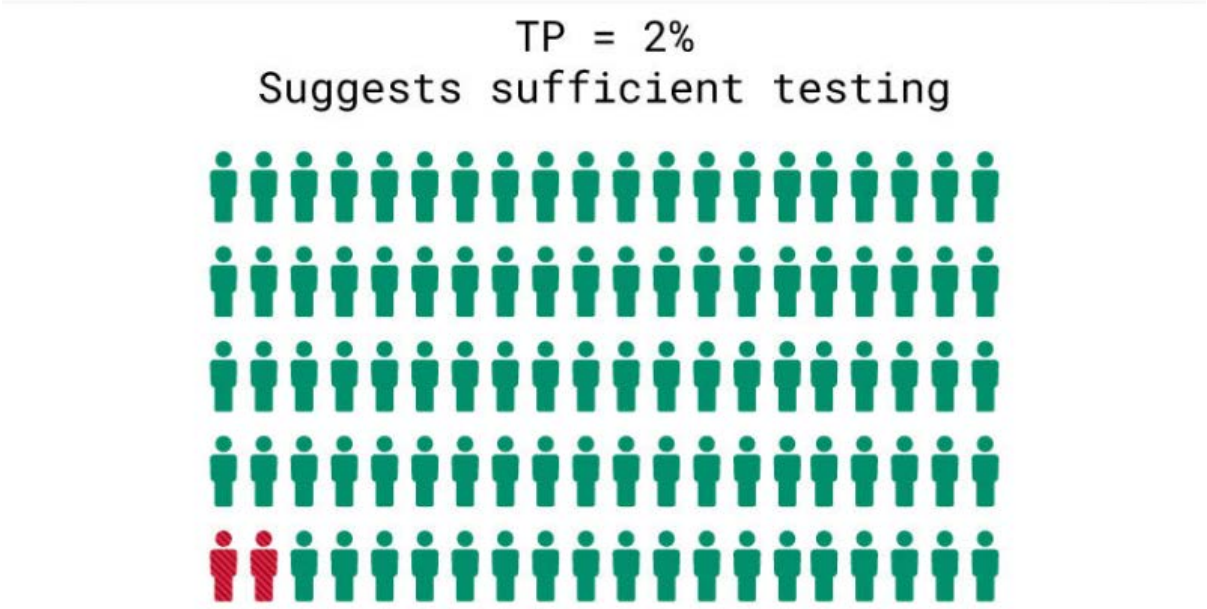


In the first scenario, 2 out of 10 people test positive for COVID, so the positive test rate is 20%. The remaining 90% of the population remain untested.

TP = 10%
Bare minimum testing



In the second scenario, 2 out of 20 people test positive for COVID, so the positive test rate is 10%. The remaining 80% of the population remain untested.



In the last scenario, 2 out of 100 people test positive for COVID, so the test positivity is 2%. The entire population is tested.

What are your sources and methodology for calculating positive test rate?

Positive test rate is calculated by dividing the number of positive tests over the number of total tests. We calculate the rate as a seven-day trailing average. It is important to note that positive test rate can be difficult to interpret and messy to calculate, for reasons well captured by the Covid Tracking Project. It should be looked at in conjunction with other metrics such as infection rate and daily new cases.

We source testing data from the Department of Health and Human Services (HHS) for state level data. We scrape official state and county dashboards for county level data and, when unavailable, fall back on a weekly test positivity rate provided by the Centers for Medicare & Medicaid Services. If you would like to learn more, check out our data sources.

How were risk levels for positive test rate determined?

There is a growing consensus that driving the positive test rate downwards of 3 percent should be a priority.

It can also be helpful to look at countries that have been most effective and efficient in their containment of COVID. South Korea was back to normal activity with a test positivity rate below 3 percent. As of November 2020, South Korea's test positivity was 1 percent.

Source: https://covidactnow.org/covid-risk-levels-metrics

Children apologize for spreading COVID-19 to relatives on death beds, officials say

"Please don't let this be your family ... Please for your loved ones stay home, stay safe."

Jan. 12, 2021, 5:38 PM HST / Source: TODAY

By Samantha Kubota

As the coronavirus pandemic rages on across the country and around the world, health officials in California are sharing a dire warning about family gatherings.

In a press conference on Monday, Los Angeles County Supervisor Hilda Solis opened her remarks with the reminder that "dying from COVID in the hospital means dying alone."

She added families have been saying their goodbyes on tablets and mobile phones.

"One of the more heartbreaking conversations that our healthcare workers share is about these last words when children apologize to their parents and grandparents for bringing COVID into their homes, for getting them sick. And these apologies are just some of the last words that loved ones will ever hear as they die alone," she said.

“Please don’t let this be your family. Don’t let this be your parents or your grandparents,” she continued. “Please, for your loved ones, stay home, stay safe, keep your loved ones alive.”

Hospitals swamped with COVID-19 cases amid questions over vaccine rollout

California has been especially hard hit by the virus, with the most cases per state in the nation, according to data compiled by NBC News. The Los Angeles Department of Public Health said Tuesday that in the county alone, more than 1,600 people have died from the coronavirus over the past seven days. That’s a rate of roughly one death every six minutes, NBC Los Angeles reported. Across the state, more than 30,000 people have died from the coronavirus.