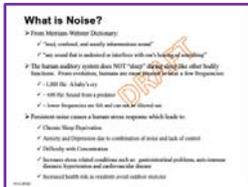


Good Evening. I am Dr John Lyver from Gainesville, and Yes, I am a retired NASA Rocket Scientist. I earned a Ph.D. in Computational Science and Informatics which is a fancy name for computer modeling. Let me add that I am a volunteer who has been doing noise analyses for several sites in western Prince William County and now your data center.

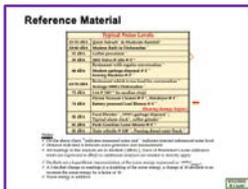
In Prince William County, the planning office staff is not able to do this type of noise analyses. I suspect a similar lack of ability in both Fauquier County and in the Town of Warrenton as well.

As residents, we have a **DUTY** to become informed and let our leaders know what **WE THE PEOPLE** feel is best for **OUR COMMUNITIES**.

Let me start by giving you a bit of background on noise before I share my analysis results.

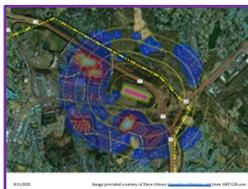


- The dictionary defines noise as an undesired sound that interferes with our hearing.
- As humans, our evolutionary growth has developed our hearing to be sensitive in the range of 600-1,000 Hz. Additionally, for our protection, our hearing does not shut down when we sleep and as a result is feeding our brains 24/7. Some examples of this sensitivity include hearing a crying baby at 3am, predator sounds, alarm clocks and surprisingly enough, human speech is in the range of 600-1,000 Hz as well.
- As a result, our ‘fight or flight’ instincts cause a Cortisol stress response when noises are heard in these frequencies. When these noises persist, they never let our brains relax and can cause effects like: sleep deprivation, anxiety, depression, concentration, and heart conditions.

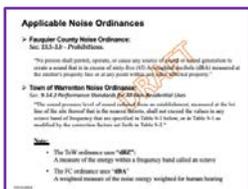


So how loud is too loud? Let me point out a few references to noise levels:

- 60 dBA is a garbage disposal
- At about 65 dBA you can’t have a conversation in a restaurant without speaking loudly
- And a GOOD vacuum cleaner and a hairdryer are in the low 70 decibels.
- Please note that a 3 decibel change is a doubling of the noise energy.



This chart shows the 591 residences that ware within 1/2 mile from of the proposed site. Due to the intensity and frequency, data center noise can be heard up to 2 miles away. So, this is chart just shows who will be MOST affected. 10% of these are outside the town limits.



The Fauquier County and Warrenton Noise Ordinances are relatively the same, but have two distinct differences you need to be aware of:

- The Fauquier Ordinance reports in dBA decibels and the Town of Warrenton reports in dBZ decibels. Don’t get confused between these two measurement types’
- “dBZ”: A measure of the actual energy within a frequency band called an octave
- “dBA”: A weighted measure of the noise energy as humans hear the sounds



So what will you hear from the single Amazon Data Center:

- I measured the noise from 3 data center sites in the Manassas area and one in Arcola in Loudoun County. From their remarkably similar readings, I calculated an average noise level from an Amazon-like building. So for the Warrenton AWS data center, the average noise level would be about 62.8 dBA measured at 500' away.
- Next I picked 21 locations surrounding the proposed data center site at various distances from the data center to analyze.
- Likewise, I have analyzed the daytime noise levels from each of the major roads in the area and then averaged the readings with the road noise values provided by the AWS noise study.

Finally, I summed the noise energies and produced this chart.



- The yellow boxes are the projected current noise levels from ONLY roads.
- The purple boxes show the readings after adding the total noise from the data center, the substation on site and the roads.
- I know this is too small to read, so to read the values, you can download these slides and my full report on the PEC website.



- On this chart, the yellow shaded area shows where the current road noise exceeds 60 decibels. This is expected on these busy roads.



- Now on this chart, I have plotted the **total** noise readings from the purple boxes:
 - The yellow shaded area shows where 60-63 decibels will be heard. This area exceeds the Fauquier County limits during daytime hours. Notice that the yellow area includes almost all of the residences that are up to 1/2 mile from the proposed data center.
 - The orange shaded area is the 63-66 decibels which includes most of the Highland neighborhood.
 - And then there is the brown area where the noise will exceed 66 decibels. It touches the Highland neighborhood to the south of the site and the undeveloped land north of US 17.

Location	Daytime	Nighttime
1	5	6.5
2	5	6.5
3	5	6.5
4	5	6.5
5	5	6.5
6	5	6.5
7	5	6.5
8	5	6.5
9	5	6.5
10	5	6.5
11	5	6.5
12	5	6.5
13	5	6.5
14	5	6.5
15	5	6.5
16	5	6.5
17	5	6.5
18	5	6.5
19	5	6.5
20	5	6.5
21	5	6.5

Finally, I converted each of the readings from the previous charts to **dBZ** to analyze conformance to the Town of Warrenton noise limits. These plots would be too numerous for us to cover in this short discussion, so this chart summarizes where violations occur for each frequency octave noise limit. For the 21 locations I calculated:

- ⇒ Not a single location is fully compliant during daytime or nighttime
- ⇒ Locations averaged 5 violations during the daytime and 6-1/2 violations at night out of 8
- ⇒ All locations had violations for both daytime and nighttime between 500 and 4000 Hz

