

RECEIVED

By The City of Oklahoma City Office of the City Clerk at 2:23 pm, Apr 04, 2024

From: Addie Heflin <addiemheflin@gmail.com>

Sent: Thursday, April 4, 2024 1:15 PM

To: City Clerk Email <CityClerk@okc.gov>; Ward3 <ward3@okc.gov>

Subject: Re: Protest PUD-1983

Some people who received this message don't often get email from addiemheflin@gmail.com. [Learn why this is important](#)

I, Addie Heflin, hereby protest PUD-1983 application by Mustang Creek Crossing LLC to rezone 810 South John Kilpatrick Turnpike. I ask you to protect our neighborhoods and families from the nuisance this venue will cause so please deny this re-zoning.

OKC, Yukon, and Mustang cities must work together to provide acceptable living conditions to their citizens, especially considering how the city borders are so mangled. The driving conditions between these cities need to be improved with the continued increase in population, and the amphitheater will only worsen driving conditions as well as other areas of the quality of life in neighborhoods surrounding the amphitheater.

Thank you for your attention,

Addie Heflin
405-503-6809

RECEIVED

By The City of Oklahoma City Office of the City Clerk at 3:49 pm, Apr 01, 2024

From: Ana Bloom <gsbloom@cox.net>

Sent: Monday, April 1, 2024 1:38 PM

To: City Clerk Email <CityClerk@okc.gov>; Ward2 <ward2@okc.gov>; Ward3 <ward3@okc.gov>; Ward4 <ward4@okc.gov>; Ward5 <ward5@okc.gov>; Ward6 <ward6@okc.gov>; Ward7 <ward7@okc.gov>; Ward8 <ward8@okc.gov>; The Mayor <mayor@okc.gov>; Ward1 <ward1@okc.gov>

Subject: Protest to the PUD-1983 rezoning effort

You don't often get email from gsbloom@cox.net. [Learn why this is important](#)

Greetings,

My name is Glenn Bloom and I live at 3216 Hampshire Lane, Oklahoma City, OK, 73179. I am sending this letter to ask for a no vote in the rezoning for PUD-1983 Sunset Amphitheater project.

There are an estimated 3,868 residential homes in a one mile radius that would be severely and adversely affected by the amphitheater. I live about 2 miles from the project and feel that the project will not only be a disaster for those immediately within the 1 mile area, but will also be extremely horrible for those of us within a 2-3 mile radius as well. We moved to this area because it was quiet and family friendly. This proposed amphitheater will destroy the harmonious environment we sought to live in.

Most of the residents of the area have to work for a living and rest is a prime concern for those who would have to deal with the noise that would extend into the night and on weekends. This includes children, families, pets and especially people already dealing daily with PTSD. It is common knowledge that 22 veterans commit suicide every day in the United States, and long term exposures to things like 120 DB loud noises contribute to the mental anguish that plagues these veterans and often push them over the edge. An open air amphitheater with constant noise could potentially be the thing that torments a veteran and pushes them to take drastic measures to end their life. I do not want my Brothers and Sisters in military service to suffer.

Another major concern of the Sunset Amphitheater project is the proximity to two Mustang schools that back right up to the proposed property. When sound checks are done at 2 PM, both schools will still be in session. However, after school events could also be adversely effected being that the schools are so close to the venue. It is also no secret that concerts attract drugs and alcohol, and these harmful substances would be right at the fence line of the two schools. If concerts are filling up and people are using drugs in the parking lot before a concert, the smoke from marijuana could easily waft over the fence line and expose families at an after school event. It could also expose student athletes to the harmful smoke.

The proposed area is already difficult for traffic when schools let out, but one can only imagine how bad the traffic would be before and after concerts. Not only would drugs and alcohol be in close proximity to the schools, but people who would be caught in the slow traffic of a concert that just let out may feel the desire to have a drink, or smoke some marijuana in the parking lot while they wait to leave, increasing the impaired

driving in the area. This is a residential area already and the last thing we need is more impaired driving.

Another extreme issue is the proximity of this venue to the turnpike and I-40 interchange where vehicles are going 70 mph. Intense stage lighting in a poorly lit area will be intensified by the lack of natural or man made ambient light and could become a major traffic safety issue. There would be nothing to block the flashing stage lights from the traffic on the highway and turnpike, making this a certain distraction for drivers which could induce accidents.

Sustainability is also a very big concern for this new concert venue proposal. Oklahoma City is already in the process of building a new NBA arena, a new multi-use outdoor soccer arena, a new OG&E Coliseum arena replacement at the fairgrounds, and that doesn't count the Zoo Amphitheater which is going to be under new management soon, the existing Paycom center, many Native American Indian Casinos and local smaller music venues, as well as Scissortail Park which is currently used for outdoor concerts. How many concert venues do we need in Oklahoma City? How many can be reasonably supported? We are in the process of getting 3 new City owned full scale arenas to add to the ones we already have and this proposal would make a total of 4 new large scale concert venues added to those already existing. This makes no sense when you consider the size and population of Oklahoma City. What happens if this 4th venue doesn't attract enough business, especially since it can only be used 5-6 months out of the year?

I have really struggled to find anything good coming from this proposal and I have drawn a complete blank. Excessive noise, uncontrollable traffic, an infusion of more drugs and impaired driving, the extreme proximity to schools, bright stage lighting, and a lack of long term sustainability all make this a severely horrible proposal in the midst of a heavily populated residential area.

I am the homeowner of the Walden Creek addition at SW 29th and Morgan Road and I ask you to please vote against rezoning for PUD-1983 to keep our area peaceful.

Sincerely,

Glenn S Bloom
Oklahoma City

RECEIVED

By The City of Oklahoma City Office of the City Clerk at 9:42 am, Mar 15, 2024

From: Anjanette Taylor <anjanettet1@gmail.com>
Sent: Thursday, March 14, 2024 4:44 PM
To: City Clerk Email <CityClerk@okc.gov>
Subject: Fwd: Sunset Amphitheater

You don't often get email from anjanettet1@gmail.com. [Learn why this is important](#)

----- Forwarded message -----

From: **Anjanette Taylor** <anjanettet1@gmail.com>
Date: Tue, Feb 27, 2024 at 11:59 AM
Subject: Sunset Amphitheater
To: <mayor@okc.gov>

Dear Mr. Holt, my name is Anjanette Arnett and I live at 1308 Fairfax Circle, Yukon, OK 73099. So yes, I am one of the residents that this will directly affect! first of all, I want to say that I have worked in the box office at the zoo amphitheater for the past nine years of my life. I have answered too many phone calls to count from the residence around there about when the noise would stop! I also know that you sit on the Oklahoma City amphitheater board! Or something like that I have literally given you tickets to get into the shows! I live in a neighborhood with a lot of children and where they're wanting to build this monstrosity is in the middle of a huge residential community!!! I know that Oklahoma City is trying to grow and I also know that 73099, which is my ZIP Code, is the third fastest growing city in the United States of America!! I ask you to put yourself in my shoes and how you would feel if they were building this by your house! I pray that you all keep our cities safe from the mistakes we have made in the past!! I would think the zoo amphitheater would be the biggest deterrent to this ever happening again! I thank you for your time, and I hope you make the right decision on this one! sincerely, Angie

RECEIVED

By The City of Oklahoma City Office of the City Clerk at 3:55 pm, Apr 03, 2024

Cameron Story
1237 Edinburg Dr
Yukon OK 73099
April 3, 2024

Barbara Peck
Council Member, Ward 3
200 N Walker Ave
Oklahoma City OK 73102

Dear Barbara Peck:

Thank you for your service to the constituents in Ward 3. Your time and efforts are appreciated.

I, Cameron Story, owner of 1237 Edinburg Dr Yukon OK 73099, do hereby protest the proposal by Mustang Creek Crossing LLC to rezone 810 South John Kilpatrick Turnpike from AA Agricultural and PUD-1628 Planned Urban Development Districts to PUD-1983 Planned Urban Development District, Ward 3. This is an area of 51 acres is within the Southeast quarter (SE/4) of Section 3, Township 11 N, Range 5 W, of the Indian Meridian, Canadian County, Oklahoma. The rezoning request has been made by Developer Sunset at Mustang Creek, LLC. The company, Notes Live Inc. hopes to rezone this area from agricultural to commercial property in order to build a 12,500-seat outdoor concert amphitheater called the Sunset Amphitheater. The proposed area is located just northwest of SW 15th and Sara Road; east of the John Kilpatrick Turnpike; and south of I-40.

A notice of the proposed PUD-1983 was not sent addressed to me, the current owner of this lot, as per legal requirement, as part of the rezoning application. A notice was instead sent addressed to the person who owned this home many years ago, Mr. Ronald Staggs. I found out about the rezoning request through neighbors who alerted me to this situation.

I am requesting that you vote “no” on April 9, 2024 when the final vote is made regarding PUD-1983 due to a number of concerns that have been noticed by myself and many other homeowners in this neighborhood. My home along with several other homes are adjacent to and in very close proximity to the proposed new amphitheater site. (Some homes are just a few hundred feet away from the site.)

The Colorado based Notes Live company plans to build a 12,500-seat outdoor concert amphitheater on this site, which will hold approximately 80 concerts or more per year. The noise level produced by these concerts will exceed normal acceptable limits for noise according to normally accepted city noise ordinances. This means that nearby homeowners will have to suffer with extremely loud noise coming from the arena every time they hold sound checks and concerts. Other similar amphitheaters which have far less seating have been known to have multiple noise complaints from neighbors who live between 2-5 miles away, and even up to 10 miles away from the amphitheater in their respective cities. My home is within a very short distance of the amphitheater sound system. These complaints have mentioned that residents living miles away from an amphitheater had to suffer through their home shaking, they could hear noise that sounded like a vacuum cleaner was being run inside their home, and they heard and felt vibrations from the concert noise frequencies.

Barbara Peck

April 3, 2024

Page 2

In order to build this massive amphitheater, the company will destroy all of the trees and vegetation currently in this area, which will mean loss of habitat for barred owls, Cooper hawks and other species of birds, deer, and an abundance of other wildlife who have already faced a reduction in available habitat due to expansion of the Turnpike and new residential areas. To destroy vegetation will disrupt the wetlands, hinder drainage, and create a devastating loss of habitat for wildlife who are already threatened by the encroachment of development into their previous areas of sanctuary. The noise levels will also negatively impact backyard birds and domestic pets who reside nearby or who take shelter in trees near the amphitheater site.

Other amphitheaters around the nation have experienced a high-volume of noise complaints from area residents who live several miles from the amphitheaters. Those amphitheaters are also 8,000 seat or smaller venues, yet the site that Notes Live is proposing here in Oklahoma City will be a vastly larger amphitheater, with an approximately 12,500 seat capacity, thus the sound levels and negative effects from traffic issues will be exponentially higher.

I am not opposed to having an amphitheater for Oklahoma City residents to enjoy, I am only opposing this particular location, as I do not believe that there has been sufficient investigation and research done into the negative consequences of putting this massive amphitheater in this location so close to a residential neighborhood, and in an area which has for many years been a much-needed habitat for many wildlife species. The disruption to homeowners and their pets along with the damage done to nearby wildlife species and their habitat is just not worth allowing this project to be built on this particular acreage. Oklahoma City is growing and expanding, which is a great thing, but please do not allow growth and progress in this city at the expense of long-time homeowners.

Please do not approve this rezoning for this area at this time. I heartfully plea with you to find a better suited area for this large of an amphitheater. This is not the right place for the Sunset Amphitheater. There are plenty of other locations which would be better suited for such a massive outdoor concert amphitheater. It should be further away from homes, and in an area where there are not wetlands, trees, a drainage area, and a wildlife habitat. Please allow additional time for studies to be done, regarding noise and the impact this project will have on the threatened Oklahoma wildlife.

I am wholeheartedly and sincerely asking for a "NO" vote to the proposed rezoning for PUD-1983.

Thank you for your thoughtful consideration in this very important matter.

Respectfully,

Cameron Story

1237 Edinburg Dr

Yukon OK 73099

RECEIVED

By The City of Oklahoma City Office of the City Clerk at 5:06 pm, Apr 03, 2024

To: Oklahoma City Council & Mayor

Subject: PROTEST PUD 1983,
Sunset Amphitheater

From: Homeowner Carlisa Hudspeth
at 10425 Leicester Dr. Yukon, OK 73099
(405) - 245-0537

I am the homeowner and my protest
is included on the next several pages.

I ask you all to vote NO = AGAINST this
PUD 1983.

10425 Leicester Dr.
Yukon Ok 73099

Carlisa Hudspeth

To: Oklahoma City Council and Mayor

Subject: Protest PUD 1983, Sunset
Amphitheater

I am writing in PROTEST to PUD 1983
at 810 South John Kilpatrick Turnpike.
There will be many serious problems if this
change is approved.

① Noise Pollution-

The studies I have read with similar venues
with similar noise levels create sound being
heard & felt. My daughter has ADHD and struggles
with sleep, the noise and vibration along with
falling objects in our home will not be conducive
for her or anyone living within 5 miles of
this. This noise pollution will also affect all animal
life. We already deal with Earthquakes and now
as a residential homeowner I and many others
will have to deal with vibration from noise.

② Safety-

I am a single mother of an 8 year old. The
reason I bought my home 14 years ago was
because this is a safe neighborhood with
close schools. Westbury South is a wonderful
neighborhood to raise children but now I'm going
Pg. 2

to be concerned about individuals driving into our neighborhood & parking, and then coming back after concert being drunk and high. I will have to be concerned with the employees that this venue will be hiring being in such close proximity to 2 of our schools and my home along with homes being turned into short term rentals for these shows and having to deal with all that each weekend. I know that none of you on the City Council would appreciate this venue being across the street from your home. There are so many issues w/ short term rentals like; drugs, alcohol and major crimes.

③ Traffic-

It is a big one as well. It already takes me 25 minutes to get from Mustang Rd on SW 15th traveling east to Sara Rd, I can't imagine or I can what chaos it will be on concert days. I have many older neighbors who often need EMS and my Mother lives with me and almost passed in 2021 from COVID. She was on a ventilator for 14 days and in Mercy for 2 months before she could be released. She has never fully recovered and still suffers from

10425 Leicester Dr.
Yukon OK 73099

Carlisa
Hudspeth

many serious illnesses and at times have needed emergency assistance. It's not just that but this will rob all of us from leaving our homes for simple pleasures of going out to eat or shopping because of the traffic issue. This will take away from our rights to have a peaceful, safe and advantageous home ownership.

(4) Home Property Values.

I am a real estate broker and own my own real estate company. The homeowners that surround this proposed venue will be negatively impacted by this venture. I will be negatively impacted by this venture. The asset of my home equity is at least \$180K. That will be severely reduced because of this project. This is so wrong to do this to hard working Oklahomans. It's not the ~~OK~~ Oklahoma way or is it American to destroy the average Oklahoman to put millions of dollars into the pockets of the rich and destroy all of the people that will be hurt financially by this project. You cannot take an event center like the Paycom and dump it in a family-friendly, residential and public school area. You will be destroying our way of life along with our finances.

Sincerely, Carlisa Hudspeth

405-245-0537

Pg 4

RECEIVED

By The City of Oklahoma City Office of the City Clerk at 10:42 am, Apr 04, 2024

From: Charles Leonard <crleonard2002@yahoo.com>
Sent: Thursday, April 4, 2024 3:11 AM
To: City Clerk Email <CityClerk@okc.gov>
Subject: Protest PUD 1983, Sunset Amphitheater

You don't often get email from crleonard2002@yahoo.com. [Learn why this is important](#)

To: Oklahoma City Council and Mayor

I, Charles Leonard, hereby protest PUD-1983 application by Mustang Creek Crossings, LLC, to rezone 810 South John Kilpatrick Turnpike.

It is an acoustical fact that low frequency sound waves travel farther than high frequency sound waves. On the African savannas, elephants are able to communicate with each other up to six miles apart due to their ability to emit such low frequency sound waves.

Low bass frequencies also penetrate structures and walls more easily than high frequencies. This is because low frequency sounds lose less energy as they pass through a solid object.

It is these low frequency sounds that will emanate from a rock concert in an amphitheater and permeate homes in surrounding neighborhoods where hard working citizens are trying to get their rest and sleep for another day at work. They deserve the peaceful and quiet enjoyment of their homes and property.

I earnestly believe that the proposed location for the Sunset Amphitheater has been ill-thought-out. I implore all City Council members, as elected officials concerned for the welfare of their constituents, to deny the rezoning of this application.

Respectfully,

Charles Leonard

Homeowner:
11701 S.W. 4th Street
Yukon, OK 73099

RECEIVED

By The City of Oklahoma City Office of the City Clerk at 12:23 pm, Apr 03, 2024

From: Chris Tate <ctate11@cox.net>
Sent: Wednesday, April 3, 2024 10:47 AM
To: City Clerk Email <CityClerk@okc.gov>
Subject: Protest PUD-1983, Sunset Amp

You don't often get email from ctate11@cox.net. [Learn why this is important](#)

We protest the PUD-1983 application by Mustang Creek Crossings, LLC to rezone 810 S. John Kilpatrick Turnpike.

We have lived in the Westbury Vista neighborhood for 14 years. My wife and I work exclusively from home and have a child who attends Mustang North Middle School. We believe this project will create a persistent negative impact to our community.

Our primary concern is the noise within proximity of schools and residential neighborhoods. The attempt by the out-of-state operators to circumvent city codes intended to protect residents, indicates their lack of consideration for the vested members of this community.

We are the homeowners of property at 10113 Aberdeen Dr. and ask you to deny the rezoning of this PUD.

Sincerely,

Chris & Jennifer Tate

10113 Aberdeen Dr.

Yukon, OK 73099

405-265-0227

RECEIVED

By The City of Oklahoma City Office of the City Clerk at 3:57 pm, Apr 03, 2024

From: Cindy Hall <cahallrn@msn.com>

Sent: Wednesday, April 3, 2024 3:02 PM

To: City Clerk Email <CityClerk@okc.gov>; The Mayor <mayor@okc.gov>; Ward3 <ward3@okc.gov>; Ward1 <ward1@okc.gov>

Cc: Ward2 <ward2@okc.gov>; Ward4 <ward4@okc.gov>; Ward5 <ward5@okc.gov>; Ward6 <ward6@okc.gov>; Ward7 <ward7@okc.gov>; Ward8 <ward8@okc.gov>; Freeman, Craig A <craig.freeman@okc.gov>; govenor@gov.ok.gov; d1.carriablumert@oklahomacounty.org; brian.maughan@oklahomacounty.org; mylesdavidson@oklahomacounty.gov

Subject: PUD -1983 I vote no on proposed rezoning of Agricultural land

Some people who received this message don't often get email from cahallrn@msn.com. [Learn why this is important](#)

To the Oklahoma City Council Members.

RE: PUD-1983. I PROTEST THE REZONING. I PROTEST THIS PROJECT MUSTANG CREEK AMPITHEATER

My name is Cindy Hall. I live at 10013 Hollyhead Way, Yukon Oklahoma. I am a home owner, and own another home in Westbury North that was my Mothers. I have lived in my home for 35 years. I have several family members who live in Westbury also. The plot of land currently zoned for Agriculture is zoned appropriately. I protest the rezoning of this land. And ask you to please vote no on rezoning this agricultural land for the following reasons.

The reasons I protest the rezoning:

1. An outdoor Amphitheater is not appropriate for an area that is strictly residential. It is inappropriate. This area is primarily residential with 13 new residential areas under construction. There are 2 schools attached to this plot of land and a wetland preservation area. By approving rezoning with full knowledge of the proposed project. The City Council is imposing noise pollution of 90-130 dB for 5 miles. Thus taking away my right to have peace and tranquility in my home and my yard and thousands of other residents. I live ¼ of a mile away from this plot of land. We have purchased our homes to live in a peaceful neighborhood. 80 DB causes hearing loss. This area is more suitable for a park with walking trails, or residential. This noise will affect people's health and mental health, ability to rest, ability to relax, ability to entertain guests in their homes. Their ability to live in a peaceful environment.

2. The current roads are not designed to accommodate 6200 additional cars. That is approximately the amount of cars for a 12,500 seat amphitheater. The roads are congested now due to 20 additional new neighborhoods in this area. Our roads are dilapidated. No thought has been given on expansion with all the new growth. Roads on Reno, Sara, and SW 15th would need expanded. With a ramp off of Sara to I40, ramp on to Kilpatrick from the Amiptheater parking lot. This area will be congested for miles on I40, Mustang road, Morgan Road, Reno, SW 15th, and Sara road. Westbury Neighborhood will be blocked in and out for miles. Residents will not be able to get to work, or return from work. Emergency vehicles will not be able to access our neighborhood to put out fires, and render emergency health care. There will be deaths because of this, and homes burned to the ground. No Interstate access for 2 miles from the

proposed amphitheater. Bottle necking our neighborhood in. And indirectly affecting traffic for 5 miles south on Morgan road, Mustang road, and I40.

3. We are tax payers generating millions in taxes, and have spent millions in real estate to purchase higher end homes to live west of Oklahoma City. For the intent of peaceful Neighborhoods. There is an article in Gainesville Sun dated Oct 18, 2017. To summarize Noise pollution is a hazard to health by the US Surgeon General William Stewart. CDC states noise pollution is an increasing public health problem. Scientific warnings are well known. The Gainesville is proposing an amphitheater. They gathered information from Florida State fairgrounds, Mountain View California, Austin Texas amphitheater, and Jacksonville Virginia Beach area state Amphitheater noise is a big problem that is unsolvable and unending once it starts. City council in these areas receive 10,000 plus complaints yearly over noise.

Residents continue legal actions and have involved the Environmental Protection Commission the problems are unresolved. Even with all the buffers, directing noise another direction its unsolvable. Residents complain the noise is so Intense pictures rattle on their walls, windows shake. They cannot escape to their backyard or their home. The noise over powers their TV. They are forced to leave their homes for peace and relaxation. They can no longer entertain in their backyards. This proposed amphitheater is proposing April through October. 4 concerts a week. It is only common sense an Amphitheater does not belong in residential areas where people sleep, rest, and relax. If people are sick, suffering from Cancer, Elderly, and Veteran with PTSD it only intensifies the problems.

I feel the City of Oklahoma City is missing out on a great opportunity. The entertainment district would be an ideal area for this venue. On the river walk would create a beautiful background with landscaping, mini bridges to enhance the venue. It would promote additional revenue to OKC. People would come to spend the day or the weekend and purchase additional venues to enjoy all the area offers. Enhancing revenue to the restaurants, ball park, hockey, myriad gardens, farmers market, and the river walk. People would love this. It also provides unlimited parking and hotels. High rise buildings to buffer the noise. It would be an additional venue to make OKC proud. Broken Arrow has designated their amphitheater to be on their river. The two venues will be compared for years to come. Sara road will be far inferior to the location of Broken Arrow. Sara road cannot compete with all the advantages downtown OKC can offer. It has taken 20 plus years to develop downtown OKC area to be what it is today. The Airport also comes to mind or Airport road close to the industrial area. But then again it cannot provide all the advantages downtown OKC can provide.

I am asking the City Council to give great consideration to this proposed rezoning of the agricultural plot. With the proposed Sunset Ampitheater. This plot is not appropriate for an ampitherater. No residential area is appropriate for an Ampitheater. A beautiful City is designed and created by building like with like. Residential compatible with residential, Entertainment with entertainment. Please vote no on re-zoning.

Thank you for your time in reviewing my letter.

Sincerely

Cynthia A Hall

owner and resident of 10013 Hollyhead Way for 35 years. And Owner of 10016 Fairfax Terrace my mothers home.

RECEIVED

By The City of Oklahoma City Office of the City Clerk at 2:46 pm, Mar 15, 2024

From: Corey Meehan <cmeehan2687@gmail.com>

Sent: Friday, March 15, 2024 2:33 PM

To: City Clerk Email <CityClerk@okc.gov>

Subject: Protest PUD-1983

You don't often get email from cmeehan2687@gmail.com. [Learn why this is important](#)

My name is Corey, and I hereby protest PUD-1983 application by Mustang Creek Crossing to rezone 810 South John Kilpatrick Turnpike. I live at 1915 Lankestar Way in the Westbury subdivision of OKC. I'm asking you to please reconsider the building of The Sunset Amphitheater. It sounds really impressive and would bring a boost to the local economy, but it would also create a nuisance to the people who live in the surrounding neighborhoods. I moved to Oklahoma nearly 10 years ago from Denver. My wife and I moved to get away from the noise and pollution that was overtaking that wonderful place. Now we find ourselves at a crossroads again of noise and pollution. We love Oklahoma and would welcome a new venue to see great talent, but just not next door. I hope you read this, and again, I ask that you would not build the Amphitheater at Mustang Creek Crossing.

Thank you,
Corey

RECEIVED

By The City of Oklahoma City Office of the City Clerk at 10:54 am, Apr 04, 2024

From: Craig Horton <hordog@sbcglobal.net>

Sent: Thursday, April 4, 2024 10:51 AM

To: City Clerk Email <CityClerk@okc.gov>; Ward1 <ward1@okc.gov>; Ward2 <ward2@okc.gov>; Ward3 <ward3@okc.gov>; Ward4 <ward4@okc.gov>; Ward5 <ward5@okc.gov>; Ward6 <ward6@okc.gov>; Ward7 <ward7@okc.gov>; Ward8 <ward8@okc.gov>; The Mayor <mayor@okc.gov>

Subject: Sunset OPEN-AIR Amphitheater

You don't often get email from hordog@sbcglobal.net. [Learn why this is important](#)

WARNING: The sender of this email could not be validated and may not match the person in the "From" field..

Our previous email detailing our objections to this proposed open-air concert venue did not include the following information.

Our home is approximately 2 miles due north of the proposed amphitheater location. The wording of Notes Live and Carol Hefner's promotion of this location infers that the neighborhoods immediately adjacent to the amphitheater will be protected from noise pollution because the sound will be directed north toward I-40, where no one will be affected. There are many neighborhoods north of I-40, including ours. We will still hear and feel the music and accompanying vibrations.

Please do not allow this venue to be built in the midst of thousands of families. Look for an alternate location that won't negatively affect family lives.

Thank you.

Karen and Craig Horton
11025 NW 21 St.

RECEIVED

By The City of Oklahoma City Office of the City Clerk at 1:24 pm, Mar 15, 2024

From: Debra Priest <priestdl54@gmail.com>
Sent: Friday, March 15, 2024 10:26 AM
To: City Clerk Email <CityClerk@okc.gov>
Subject: Protest PUD-1983

[You don't often get email from priestdl54@gmail.com. Learn why this is important at <https://aka.ms/LearnAboutSenderIdentification>]

I, Debra Priest, hereby protest PUD-1983 application by Mustang Creek LLC to rezone 810 South John Kilpatrick Turnpike

Debra Priest
2232 Timber Crossing
Yukon, OK 73099
580-421-4688

Sent from my iPad

RECEIVED

By The City of Oklahoma City Office of the City Clerk at 3:51 pm, Mar 18, 2024

From: Glenda Tulp <g.tulp@yahoo.com>
Sent: Monday, March 18, 2024 11:58 AM
To: City Clerk Email <CityClerk@okc.gov>
Subject: Protest PUD-1983

You don't often get email from g.tulp@yahoo.com. [Learn why this is important](#)

I, Glenda M. Tulp, a resident of Ward 3, hereby protest PUD-1983 application by Mustang Creek Crossing LLC to rezone 810 South John Kilpatrick Turnpike. My private residence is in the Timber Creek addition just off 15th street and Mustang Road which is less than a mile from the site referenced above.

I am in protest of this application for the reasons listed below:

- 1) The extremely heavy traffic in this area is taxing the two-lane streets at present as Mustang Road is the only multiple lane street in the area. The added traffic caused by the venue would make it impossible to navigate our streets in a reasonable manner.
- 2) We have very minimal police/highway patrol presence in this area due to the multiple jurisdictions. Mustang Road seems to be a racetrack, especially on weekends and late nights for sport car enthusiasts and will only be compounded by the proposed venue.
- 3) Noise pollution is real! Ask any family that lives with a loved one suffering from Autism, PTSD, Alzheimer's, and other conditions that are bothered by loud, unrelenting noises. The low frequency bass vibration is noise pollution and cannot be controlled by the homeowners.
- 4) Negative impact on schools and churches in the area is a concern. The proposed sound checks will start while school is still in session, (2:00 pm) and with multiple public schools and churches within close proximity and the increased decibel level, 5 dB over city sound ordinance, there will be possible disruption of their activities. All school and church activities are not limited to day time activities.
- 5) Decreased property value due to degradation of the environment is most likely to happen. The quiet neighborhoods in this area will be no more. The question I would propose, "Would you want this in your neighborhood? Thank you for listening to the people that live in this area and hearing our concerns. Your consideration to stop this project is greatly appreciated.

Respectfully,

Glenda M Tulp
11741 SW 24th Street
Yukon, OK 73099
580/571-4688

From: [Jay Tate](#)
To: [City Clerk Email](#)
Subject: Protest PUD-1983
Date: Friday, March 29, 2024 3:49:08 PM

You don't often get email from jtate9@zoho.com. [Learn why this is important](#)

City Clerk,

I have been notified of the Protest PUD-1983 for the Amphitheater. This is approximately 1.25 miles from my home. I am not against the installation.

Thank You

Jay Tate

Sent using [Zoho Mail](#)

City Council, City of Oklahoma City
cityclerk@okc.gov

Jennifer and Adam Hinsperger
2412 Crystal Creek Drive
Yukon, OK 73099

Re: PROTEST of PUD #1983

April 3, 2024

Dear Councilmembers:

I write this letter in protest to the proposed “Sunset Amphitheater” (PUD #1983) near S.W. 15th Street and Sarah Road in far west Oklahoma City. I grew up in the Mustang/Yukon area and have lived here most of my life. This is a wonderful community and a great place to raise a family. My husband and I have two little boys, who are now two and seven years old. Two years ago, we decided to build what we hope will be our “forever” home along the Mustang Creek in the Crystal Creek at Westbury addition (near S.W. 29th Street and Sara. Road). We specifically chose this location not only for the great schools and closeness to family, but also because of the peace and quiet our neighborhood provides. As our house is only a mile and a half from the proposed outdoor amphitheater, we now find the peaceful enjoyment of our own home to be in imminent jeopardy.

There are many obvious reasons why the amphitheater project is a terrible idea for this area. I would like to address the three most troubling to me: noise pollution, the proximity to public schools, and public safety. First and foremost, despite the developer’s claims to the contrary, the sound from the venue will without doubt be intolerable to those of us living close by. Notes Live has already requested a variance above the City’s ordinary decibel limits. And it’s not only the soundwaves traveling through the air that will create a nuisance, but also the incessant bass reverberating through the ground.¹ With the extended curfew Notes Live has also sought from the City, I have no idea how my children will be able to concentrate on homework in the evenings or get to sleep at a decent hour. And, as experience tells us, the venue is unlikely to abide by curfew limits. Shows start late, fans demand encores, and any fine imposed for a curfew violation would be a drop in the bucket to concert organizers. There is simply no effective means of enforcement. For the surrounding neighborhoods, especially the Westbury additions *directly across the street*, there will be no meaningful recourse for the intrusion into their own homes.

Second, the proposed amphitheater will literally back up to the property lines of both Mustang Creek Elementary and Mustang North Middle School (where my children will attend). The developers have already acknowledged they will begin sound checks for events at least an hour before school lets out. This will plainly disrupt both instruction hours and afterschool activities. I would also invite council members to sit outside these schools during school pick-up

¹ See, e.g., [Hayden Homes Amphitheater neighbors plead for venue to lower the volume | Central-oregon-daily | centraloregondaily.com](https://www.centraloregondaily.com/news/hayden-homes-amphitheater-neighbors-plead-for-venue-to-lower-the-volume/). Please note the venue operator admits “it is not as simple as turning down the volume,” “there is no golden fix” for the issues the bass creates, and adjusting sound levels would “really hamper the viability” of booking big-ticket acts.

times. That is, if you can even get through traffic to do so. Because both 15th Street and Sara Road are two-lane roads. Under ordinary circumstances, they are nearly impassible during school drop-off/pick-up times and evening rush hour. An influx of 12,000 concert goers, plus vendors and other concert workers, will create unimaginable gridlock.

Finally, a venue like this, particularly this close to schools and neighborhoods, will cause numerous public safety concerns. I was a prosecutor in Oklahoma County for ten years, and I am all too aware of the safety risks large-scale performance venues like this can create. Drug use and drunk driving are the most obvious problems such venues invite, but in today's times we can also expect the violence that inevitable accompanies large crowds and intoxicants. In the event of a true emergency, it will be nearly impossible for first responders to timely respond due to the relative inaccessibility of the venue, which—again—is limited to two-lane roads. From a purely public safety perspective, this venue will pose a nightmare for rescue workers.

To be clear, I am not opposed to Oklahoma City hosting a large outdoor concert venue like this, provided it is sufficiently remote from residential and school properties. I am also not opposed to the commercial development of the area near S.W. 15th Street and Sara Road. On the contrary, we could really benefit from more retail and dining options on our side of town. However, the development of the proposed outdoor amphitheater at this location will be disastrous for those of us that will have to live with it in our backyards, essentially, forever. Simply put, the Sunset Amphitheater and Notes Live will be the worst possible neighbors. For the sake of my family and my community, I oppose in the strongest terms PUD #1983 and respectfully ask this Council to deny the developer's application.

Sincerely,

Jennifer Hinsperger

RECEIVED

By The City of Oklahoma City Office of the City Clerk at 3:51 pm, Mar 18, 2024

From: John Tulp <johntulp@yahoo.com>
Sent: Monday, March 18, 2024 12:50 PM
To: City Clerk Email <CityClerk@okc.gov>
Subject: Protest PUD-1983

You don't often get email from johntulp@yahoo.com. [Learn why this is important](#)

Dear Ms Simpson,

I, John Peter Tulp, a resident of Ward 3, hereby protest PUD-1983 application by Mustang Creek Crossing LLC to rezone 810 South John Kilpatrick Turnpike. My private residence is in the Timber Creek addition just off 15th street and Mustang Road is less than a mile from the site referenced above.

I am protesting this application for the following reasons:

- 1) The existing heavy traffic in this area is already overloading the predominately two-lane streets as well as Mustang and Sara Roads. The high traffic added by the proposed venue would make it impossible to navigate our streets in a reasonable manner for hours before, during, and after all events.
- 2) Decreased public safety. We presently have minimal traffic enforcement in this area and many traffic accidents. The heavy traffic from the proposed venue will make the roads even more dangerous. Also, the influx of many nighttime strangers to this area will further compromise the safety of area residents.
- 3) Noise pollution will occur. Ask any family that lives with a loved one suffering from Autism, PTSD, Alzheimer's, and other conditions that are bothered by loud, unrelenting noises. The far-traveling low frequency bass vibrations will penetrate our residences and our lives for hours at a time.
- 4) Negative impact on schools and churches in the area. The proposed sound checks will start while school is still in session (2:00 pm). The multiple public schools and churches within 2 miles will have their activities disrupted by the proposed increased sound level of 5 dB over city sound ordinance. School and church activities are not limited to daytime activities.
- 5) Decreased property values due to degradation of the local environment will be caused by all the above points. The quiet, safe, and friendly neighborhoods that brings people to this area will be no more. The question I propose to you is, would you want this venue and all that comes with it in your neighborhood?

Thank you for listening to the people that live in this area and hearing our concerns. Your consideration to stop this project is greatly appreciated. Please vote No.

Respectfully,
John Peter Tulp
11741 SW 24th Street
Yukon, OK 73099

RECEIVED

By The City of Oklahoma City Office of the City Clerk at 9:45 am, Apr 01, 2024

From: Linda hall <johnlindahall@msn.com>

Date: March 27, 2024 at 3:27:53 PM CDT

To: cityclerk@okc.gov

Subject: Protest PUD - 1983

I Linda Hall hereby protest PUD-1983 application by Mustang Creek Crossing to rezone 810 South John Kirkpatrick Turnpike. If this is approved I have the following concerns.

1. I live in the blast zone (1 mile away) Even though I might not hear the music I will feel the vibrations and possibly the bass. In research of other similar amphitheatres people three miles away feel the vibrations strongly in their homes. This is a residential community that houses elderly and many school age children. The 2 schools right at the property will be affected as well as the sleep of the children that attend there.
2. The increased traffic that will happen every evening there is a concert will be extremely disruptive to our residential areas. As you know 1,000s of homes have been added to the area in the last five years, however the infrastructure has not been improved enough to handle that surge in people. The amphitheater will not help to improve the infrastructure but will further deteriorate it. The drainage remains a concern. The roads are mainly two lane except for the few major streets they have widened. When the turnpike was extended the 40 enters onto the turnpike right at the 15th street off-ramp. As it is now the traffic backs up onto the turnpike between 4:30 to 6:30. You add 3000 plus cars trying to get to the amphitheater for a 7:00 concert and you will have not only horrific traffic jams but the residents of the area cannot get home and several may be late to the concert. Emergency vehicles will have a difficult time getting through. In addition there are only 3,500 parking spaces and 12,500 seats! No rapid transit! Where will they park? In our neighborhoods?
3. Our residential property values will go down, we may not even be able to sell. No one wants to buy a house that vibrates and has excessive traffic several nights a week.

Please be respectful of the thousands of residents that are affected by this PUD, and keep our communities safe and noise/vibration free. I am a homeowner of the property at 9901 SW 15th Terrace Yukon OK 73099. Please vote to deny and reject PUD - 1983.

Thank you for your consideration,
Linda Hall

From: Misti Foster <mistifoster11@gmail.com>
Sent: Friday, March 29, 2024 9:57 AM
To: City Clerk Email <CityClerk@okc.gov>
Subject: Protest PUD-1983

RECEIVED

By The City of Oklahoma City Office of the City Clerk at 9:45 am, Apr 01, 2024

You don't often get email from mistifoster11@gmail.com. [Learn why this is important](#)

I, Misti Foster, herby protest PUD-1983 application by Mustang Creek Crossing LLC to rezone 810 South John Kilpatrick Turnpike.

I live in Westbury North addition, this would only be 1,500 ft from my house. I have young children. Low frequency bass/sound and its effects on people, ESPECIALLY children is not good - headaches, anxiety, etc. This makes me especially sad for those with special needs in the area.

That's just one of the reasons why those of us that live in the area that will be about 1,500 ft from this amphitheatre are opposed. The traffic will also be a nightmare, as it already is at the SW 15th & Sara intersection in the afternoons.

They can't promise that they won't hold their events/concerts on nights that the schools are doing events either. Also, the concerts will take place on some school nights (Thursdays) and 7 months out of the year. Do you realize how awful this will be for our children's sleep?

Build it somewhere not so close to a residential area!

I ask you to protect our neighborhoods and families from the nuisance this venue will cause so please deny this.

Kind Regards,
Misti Foster, M.Ed.

RECEIVED

By The City of Oklahoma City Office of the City Clerk at 9:45 am, Apr 01, 2024

From: Michael Wilder <mike.wilder@all-american-notary.com>

Sent: Friday, March 29, 2024 1:18 PM

To: The Mayor <mayor@okc.gov>; Ward3 <ward3@okc.gov>; City Clerk Email <CityClerk@okc.gov>;
Freeman, Craig A <craig.freeman@okc.gov>

Subject: Protest of Sunset Amphitheater

You don't often get email from mike.wilder@all-american-notary.com. [Learn why this is important](#)

Dear sirs and madams,

As a local resident and small business owner, I am writing in solidarity with others in protest of the proposed location for the Sunset Amphitheatre. Let me be clear. I am **not** opposed to the amphitheatre itself. Just the currently proposed location.

We all know perfectly well that you can't put ten pounds of dirt in a five pound sack but that is the equivalent to what will happen with an influx of that many people and vehicles to that particular piece of property.

Sara Rd. and 15th St. (an area already long under construction and much to the dismay of locals at Rush Hours especially) will need to be widened even farther, leading to even worse issues than the currently existing and unpleasant ones and this is just the tip of the iceberg. As I understand it, the amphitheater alone (not including the other tenants proposed but they'll be affected as well) will hold 12, 500 people but there is only going to be parking for 3,500 cars. I (and many others) believe that this is a gross underestimate and that the overflow of vehicles will be forced to spill into other places and human nature being what it is, this will include the already congested Sara Rd. and 15th Street, and/ or the other tenants' parking spaces.

Which leads me to Mustang Rd. What a nightmare it already is and you want to bring in that many more people/cars to the area!? You folks must not even live or travel around here if you actually think that this is a good spot for this. And I'm sure that I'm missing other aspects of just this issue and I haven't even gotten to the noise concerns.

So my family and I (and our neighbors,) having worked hard to afford to buy a house and the whole deal, are trying to relax and enjoy our little slice of paradise but will now be exposed to an event bringing 12,500 screaming fans and all the bad that goes with them to our backyard!? I think not. You don't get to tax us and then make the area virtually unlivable with something like this too. This is just not right.

Like I said in the beginning, I'm opposed to the currently proposed location. Not the project itself. Find a better place to build it, such as the piece of property being rumored to exist a short distance away up the turnpike, and I believe that it will bring jobs and even more economic growth to our area, but in a smart way that allows us ALL to enjoy the fruits of it without all of the very negative impacts the currently proposed location will bring.

Thank you for your time and consideration and see you at the next council meeting!

At your service,
Mike Wilder-[Notary Public/ CNSA](#)

CEO [All-American Notary Services](#)
mike.wilder@all-american-notary.com
301 Pointe Parkway Blvd #711
Yukon, OK 73099
(405) 723-1666

From: dryt trhyt <diemthuytran_vn@yahoo.com>
Sent: Friday, March 29, 2024 1:28 PM
To: City Clerk Email <CityClerk@okc.gov>
Subject: PROTEST to PUD 1983, sunset amphitheater

RECEIVED

By The City of Oklahoma City Office of the City Clerk at 9:45 am, Apr 01, 2024

You don't often get email from diemthuytran_vn@yahoo.com. [Learn why this is important](#)

To: Oklahoma City Council and Mayor

Subject: Protest PUD 1983, Sunset Amphitheater

I am writing in PROTEST to PUD 1983 at 810 South John Kilpatrick Turnpike. There will be problems if this is approved.

1. The noise from the 12,000 seat amphitheater concerts will be very loud to the surrounding neighborhoods.
2. Here is an article called "East Nashville residents fume over noisy Beck concert at Ascend Amphitheater."

Complaints like this are typical around amphitheaters.

<https://www.tennessean.com/story/news/2018/05/07/east-nashville-residents-complain-overnoisy-beck-concert-ascend-amphitheater/586252002/>

3. In the article above: Live Nation said, "at no time during the Sunday night Beck show did decibel levels eclipse the acceptable level that Metro Parks and Live Nation have agreed for shows at Ascend." The concert provider proclaimed compliance, but their self-regulation of noise level did not protect the residents. Please do not repeat the same mistake. OKC residents deserve better. Please protect OKC residents from noise pollution.

4. This location for this amphitheater is way too close to the two schools: Mustang North Middle School and Mustang Creek Elementary. Thousands of kids will be adversely impacted by this development.

We are the homeowners of property at 2100 Pine Creek Ave, Yukon, OK 73099. We ask you to vote against this PUD in its current form.

Sincerely,
Vicky Tran

From: Tim White <timleah@sbcglobal.net>

Sent: Friday, March 29, 2024 1:47 PM

To: City Clerk Email <CityClerk@okc.gov>

Cc: Tim White <timleah@sbcglobal.net>

Subject: PROTEST PUD 1983/ SUNSET AMPHITHEATER PROTEST

RECEIVED

By The City of Oklahoma City Office of the City Clerk at 9:46 am, Apr 01, 2024

You don't often get email from timleah@sbcglobal.net. [Learn why this is important](#)

WARNING: The sender of this email could not be validated and may not match the person in the "From" field..

Good Afternoon,

My name is Tim White, and I am protesting the PUD1983 application by Mustang Creek Crossing LLC to rezone 810 South John Kilpatrick Turnpike. I live at 10117 Banff Way Yukon, Oklahoma 73099.

This is going to affect our family in the following ways:

1- We all work early at our house and start our day at 3:00 AM. We often go to bed around 7:00 PM in order to get enough rest. IF this amphitheater is built this would greatly affect our rest and cause serious issues because of all the noise and also vibration from the bass noises. I would respectfully ask that a 3rd party independent noise study be conducted. Please be aware that the Zoo Amphitheater continues to have noise issues and there is nothing that the residents or anyone else can do to stop it. The idea with Live Notes would be to build it and just pay the fines leaving the residents who live here with no option to respond.

2- My wife Leah and daughter Gracie suffer from serious migraines and when they have those episodes noise and vibration makes them quite sick and miserable. At times their medications will not help and its better for them to remain in a quiet situation. We are concerned that if the amphitheater is allowed to be constructed there could be a situation where the migraines are unbearable.

3- We currently have issues in the area with the normal flow of traffic going in and out of the Westbury neighborhoods especially along the school routes that back up during the afternoon when school lets out. Seems like the amount of traffic along Sarah Road has issues late in the afternoon rush hour and lasts sometimes until after 7:00 PM. The normal traffic has caused serious issues. I can't imagine 12,500 people plus workers and band traffic during the day hampering and obstructing the regular flow of traffic we currently have.

4- How would our first responders react to the amount of traffic? The pre-concert traffic and post-concert traffic will make it very difficult for our emergency vehicles and personnel to access our homes in all the affected area.

5- Where are all the people going to park since the parking space will not hold every car for 12,500 people? Most likely they will park in our neighborhoods. This will cause a lot of issues with getting in and out of our homes. If they park all through the neighborhoods that is opening up a door for more crime like vandalism and theft. If people have been drinking, then that means there will be a bunch of drunk driving in and out of the neighborhoods. If this is allowed to be built the people that have never been to the area will be driving the neighborhoods looking for a quicker way to access the parking areas trying to get around the traffic mess this will create.

6- Usually, the norm for a venue like this will cause the value of our property to decline and the crime issue to increase.

7- The Mustang schools would be right in the path of the issues the Ampitheater would create. Putting it close to our schools will create problems with crime and noise pollution leading up to the concert for the day. (ie sound checks and practicing from the venues)

I am asking you to protect our neighborhoods and families from the problems this venue will cause to this area by denying this rezoning.

Respectfully,
Tim White

From: Karl Edgin <kje56@hotmail.com>
Sent: Friday, March 29, 2024 1:44 PM
To: City Clerk Email <CityClerk@okc.gov>
Subject: Protest PUD 1983

RECEIVED

By The City of Oklahoma City Office of the City Clerk at 9:46 am, Apr 01, 2024

You don't often get email from kje56@hotmail.com. [Learn why this is important](#)

I can not believe OKC is considering changing the zoning to allow this Amphitheater to be built directly across the street from an established neighborhood AND directly behind a grade school.

The concerts would end, so they say at 11:00pm! New babies, grade school, middle school high and college students live in this neighborhood and the music would certainly effect their lives along with ever resident that lives in these neighborhood.

A 12,000 seat venue with a 3,000 car parking lot would endanger the emergency vehicles in order to respond in emergencies because of the limited access to the 2lane street, Sara rd.

Regards, Karl Edgin

From: Brian Greer <brianpgreer@gmail.com>
Sent: Friday, March 29, 2024 2:10 PM
To: City Clerk Email <CityClerk@okc.gov>
Subject: Protest PUD 1983, Sunset Amphitheater

RECEIVED

By The City of Oklahoma City Office of the City Clerk at 9:46 am, Apr 01, 2024

You don't often get email from brianpgreer@gmail.com. [Learn why this is important](#)

I am writing in protest to PUD 1983 at 810 South John Kilpatrick turnpike. This will cause numerous disruptions and a multitude of problems for the surrounding residents and schools.

1. The noise pollution from the amphitheater will negatively affect not just the lives but the physical health of the surrounding residents. It is well known in the medical community the link between excess noise pollution and dementia ("Chronic noise exposure and risk of dementia" <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC9251202/>) and the link between noise pollution and poor cardiovascular health ("Cardiovascular effects of environmental noise exposure" <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3971384/>).

2. There are a significant number of children who are going to be negatively affected by the noise pollution, my child included. Currently there are two schools (Mustang North Middle School and Mustang Creek Elementary) just a couple hundred feet south of the proposed development site. The PUD allows the concert venue to begin sound tests at 2 pm when school is still in class. The schools also host functions after school during hours when the concerts will be happening. This is an absolutely obscene level of noise pollution to be exposing our kids too. The link between noise pollution and mental health issues is well studied in adults but now everyday we are finding out just how terrible it is for the mental health of kids ("Negative Impact of Noise and Noise Sensitivity on Mental Health in Childhood" <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6301087/>). Subjecting kids to this level of noise pollution is just unconscionable.

3. My family first moved to Westbury South in 1985. We moved to our current house at 10405 Paisley Rd in 1993. We have been living in this community for nearly 40 years. There are numerous other families just like mine who have lived in this community as long or longer. This is a quiet suburb that has housed a working class population servicing Oklahoma City for nearly 50 years. Building a 12,000 seat amphitheater right in the middle of 2 schools, 5 apartment complexes and numerous neighborhoods and businesses is just a terrible idea. Especially when you consider there is a significant number of retirees and other people who will not be able to leave do to the increase cost in housing. The Federal Reserve has continued to raise interest rates in recent years to combat inflation and a 30 year fixed currently sits around 7.5%. Many residents here could not afford to move to a new area due to the increased of housing and they simply should not have too.

I stand opposed and in protest to PUD 1983.

Brian Greer
10405 Paisley Rd

Yukon, OK 73099

405-324-5751 Home phone

405-549-8490 Cell phone

From: Craig Horton <hordog@sbcglobal.net>
Sent: Friday, March 29, 2024 2:35 PM
To: City Clerk Email <CityClerk@okc.gov>
Subject: Sunset Amphitheater

RECEIVED

By The City of Oklahoma City Office of the City Clerk at 9:46 am, Apr 01, 2024

You don't often get email from hordog@sbcglobal.net. [Learn why this is important](#)

WARNING: The sender of this email could not be validated and may not match the person in the "From" field..

(The following email was sent March 19th to Mayor Holt and the 8 city council members. The City Clerk's office was not on the list of recipients. I am correcting that omission.)

I respectfully ask Mayor Holt and the City Council to reject building an open-air amphitheater in dead center of multiple neighborhoods and schools. For these residents, it will be a huge negative quality of life. Please consider the well-being of our children.

Noise Pollution: loud thumping bass frequencies cause lack of sleep quality, disruption and loss of sleep for all ages, but especially babies, toddlers, and young children at naptimes and bedtimes. Getting the kids up to go to school the next morning after a week-night concert that ended at 10:30 the night before will not be easy or fun. Soundchecks beginning at 2 p.m.? School is still in session at Mustang Creek Elementary and Mustang North Middle School. When can students successfully do homework without the noise assaulting their ears and brains? Sound travels a long way, and there will only be one barrier to soften the concert noise-the exterior walls of each home or school.

Traffic congestion and gridlock: I-40 and Mustang Road is congested now. The next exit is Morgan Road with all the truck stops and 18- wheelers. I40 and Council is an awful choice. No exit for Sara Road, which is a 2-lane road. From the turnpike, SW 15th is not in the best condition. Adding 12.5K people trying to get to the amphitheater, finding a parking spot (and perhaps parking in the neighborhoods if it's easier for them) will be a nightmare.

Teachers trying to teach during soundchecks will be difficult. I can't imagine owning one of the homes across the road from this proposed venue. Being assaulted with the noise pollution and traffic frustrations while trying to raise a happy and healthy young family, or being a veteran with PTSD, having autism and noise sensitive syndromes, or having an ambulance unable to quickly get to my house would be a miserable way to live. Decibel levels and event timeframes are being increased, and I assume the number of events will follow suit. I believe very few people would consider buying a home that close.

Please do not allow this monstrosity to be built. Please vote against it. Thank you.

Karen and Craig Horton

11025 NW 21 St.

Yukon, OK 73099

RECEIVED

By The City of Oklahoma City Office of the City Clerk at 9:46 am, Apr 01, 2024

-----Original Message-----

From: wayne@schrzan.com <wayne@schrzan.com>

Sent: Friday, March 29, 2024 2:44 PM

To: City Clerk Email <CityClerk@okc.gov>

Subject: Protest PUD-1983

[You don't often get email from wayne@schrzan.com. Learn why this is important at <https://aka.ms/LearnAboutSenderIdentification>]

I Wayne Schrzan herby protest PUD-1983 application by Mustang Creek Crossing LLC to rezone 810 South John Kilpatrick Turnpike. I ask you to protect our neighborhoods and families from the nuisance this venue will cause so please deny this rezoning.

Thank you,

Wayne Schrzan

RECEIVED

By The City of Oklahoma City Office of the City Clerk at 9:46 am, Apr 01, 2024

From: Karla Guerriero <karlacat19@gmail.com>
Sent: Friday, March 29, 2024 2:52 PM
To: City Clerk Email <CityClerk@okc.gov>
Subject: Protest PUD-1983

You don't often get email from karlacat19@gmail.com. [Learn why this is important](#)

I, Karla Guerriero, hereby protest PUD-1983 application by Mustang creek crossing LLC to rezone 810 South John Kilpatrick Turnpike. I find it amazing that an outside music venue would be situated right next door to 2 schools. Both my children attended those schools and every time there was a ball game or school event of any kind, the traffic was very congested on the 2 lane street. I know the streets around that area will not be adequate for 12,000 people to navigate, especially if there is a school event. It will be gridlock!

We live less than 3 miles from this spot and I am VERY distressed at the thought of our noise level going up. From what I've read, the bass sounds and vibrations travel for miles. I don't want my property values to go down as a result of this being so close to residential neighborhoods. We are already being overrun with new neighborhoods, massive apartments, businesses, etc. Our nice area is becoming a traffic nightmare as it is now. Please do not allow rezoning of this property.

--

Karla Guerriero

From: Carina Armstrong <trackingcarina@gmail.com>
Sent: Friday, March 29, 2024 3:00 PM
To: City Clerk Email <CityClerk@okc.gov>
Subject: Protest PUD-1983

RECEIVED

By The City of Oklahoma City Office of the City Clerk at 9:46 am, Apr 01, 2024

You don't often get email from trackingcarina@gmail.com. [Learn why this is important](#)

I Carina Armstrong herby protest PUD-1983 application by Mustang Creek Crossing LLC to rezone 810 South John Kilpatrick Turnpike." You can end with something like: "I ask you to protect our neighborhoods and families from the nuisance this venue will cause so please deny this rezoning."

From: carina armstrong <thiswillbeanew@hotmail.com>
Sent: Friday, March 29, 2024 3:02 PM
To: City Clerk Email <CityClerk@okc.gov>
Subject: "Protest PUD-1983"

RECEIVED

By The City of Oklahoma City Office of the City Clerk at 9:46 am, Apr 01, 2024

You don't often get email from thiswillbeanew@hotmail.com. [Learn why this is important](#)

I Donna Armstrong herby protest PUD-1983 application by Mustang Creek Crossing LLC to rezone 810 South John Kilpatrick Turnpike." You can end with something like: "I ask you to protect our neighborhoods and families from the nuisance this venue will cause so please deny this rezoning."

Sent via the Samsung Galaxy Note20 Ultra 5G, an AT&T 5G smartphone
Get [Outlook for Android](#)

From: Anthony Buu <anthony.buu101@yahoo.com>
Sent: Friday, March 29, 2024 3:06 PM
To: City Clerk Email <CityClerk@okc.gov>
Subject: Protest PUD 1983, Sunset Amphitheater

RECEIVED

By The City of Oklahoma City Office of the City Clerk at 9:46 am, Apr 01, 2024

You don't often get email from anthony.buu101@yahoo.com. [Learn why this is important](#)

I Anthony Buu, hereby PROTEST to PUD 1983 application by Mustang Creek Crossing LLC to rezone 810 South John Kilpatrick Turnpike. There will be problems if this is approved.

1. The noise from the 12,000 seat amphitheater concerts will be very loud to the surrounding neighborhoods.
2. Here is an article called "East Nashville residents fume over noisy Beck concert at Ascend Amphitheater."

Complaints like this are typical around amphitheaters.

<https://www.tennessean.com/story/news/2018/05/07/east-nashville-residents-complain-overnoisy-beck-concert-ascend-amphitheater/586252002/>

3. In the article above: Live Nation said, "at no time during the Sunday night Beck show did decibel levels eclipse the acceptable level that Metro Parks and Live Nation have agreed for shows at Ascend." The concert provider proclaimed compliance, but their self-regulation of noise level did not protect the residents. Please do not repeat the same mistake. OKC residents deserve better. Please protect OKC residents from noise pollution.

4. This location for this amphitheater is way too close to the two schools: Mustang North Middle School and Mustang Creek Elementary. Thousands of kids will be adversely impacted by this development.

We are the homeowners of property at 2120 Pine Creek Ave, Yukon, OK 73099 Phone #405.996.6085. We ask you to vote against this PUD in its current form.

Sincerely,
Anthony Buu

From: ANDI COTTRILL <v2393v@yahoo.com>
Sent: Sunday, March 31, 2024 6:55 PM
To: City Clerk Email <CityClerk@okc.gov>
Subject: Protest to PUD 1983

RECEIVED

By The City of Oklahoma City Office of the City Clerk at 9:46 am, Apr 01, 2024

You don't often get email from v2393v@yahoo.com. [Learn why this is important](#)

I, Andi Cottrill, and spouse Keith Cottrill, do hereby protest PUD 1983 by Mustang Creek LLC to rezone 810 S John Kilpatrick Turnpike.

As homeowners residing in the Westbury North neighborhood, our address is 3/4 mile from the proposed location of the Sunset Amphitheater. Westbury North & Westbury South neighborhoods have existed for close to 50 years and a good portion of our neighbors are seniors, many of which are war veterans with severe handicaps, some due to combat.

I am Keith's full time caregiver. He is a Purple Heart recipient, suffers from Agent Orange exposure and Alzheimer's disease.

I in turn, deal with hyperacusis which at times is nothing less than debilitating.

We opted to buy our "final" home here in Westbury due to the peaceful & relaxed environment it offered. Many improvements have been made at great cost to get our house livable and meet Keith's needs. An amphitheater will literally destroy the quiet he requires to function without the stress of extreme noise volume and could very well cause us to have to have sell our home and move which we cannot afford.

Base points:

- Noise projection eliminates the peaceful environment **necessary for mental calm**
- Noise will affect children's sleeping patterns
- Noise will cause animal (pets) behavioral issues
- Proposed location is entirely too close to elementary & middle schools on SW 15th St which will interfere with classes and testing

We beg your compassion and beseech you to please vote NO on the proposed Sunset Amphitheater.

Sincerely

Andi Cottrill
Keith Cottrill
10313 Birkenhead Rd, Yukon OK 73099

From: Karl Edgin <kje56@hotmail.com>
Sent: Sunday, March 31, 2024 3:52 PM
To: City Clerk Email <CityClerk@okc.gov>
Subject: Protest PUD 1983 Amphitheater

RECEIVED

By The City of Oklahoma City Office of the City Clerk at 9:47 am, Apr 01, 2024

You don't often get email from kje56@hotmail.com. [Learn why this is important](#)

I Karl Edgin herby protest PUD-1983 Mustang Creek Crossing ,LLC to rezone 810 South John Kilpatric Turnpike.

I am the home owner of 10412 Fairfax Lane and ask you **deny** the rezoning of this application.

This amphitheater is **1 block from my house!** The noise will be unbearable and unhealthy for everyone. Concerts will not end until 11:00 pm! Way past school children's bedtime. Which means if they can get to sleep it won't be quality sleep.

The peaceful neighborhood ruining our way of life after so many years and decades.

The amphitheater will be built directly behind a grade school. These kids are in this established neighborhood. The school grounds will no doubt be impacted by the trash from this venue such as paper, plastic containers, beer bottles, and possible drug paraphernalia.

The depreciation of our homes will be greatly reduced.

Sincerly, Karl Edgin

From: Jan Kosmoski Carr <koz carr@me.com>
Sent: Sunday, March 31, 2024 3:19 PM
To: Ward3 <ward3@okc.gov>
Cc: City Clerk Email <CityClerk@okc.gov>
Subject: Protest PUD-1983

RECEIVED

By The City of Oklahoma City Office of the City Clerk at 9:47 am, Apr 01, 2024

You don't often get email from koz carr@me.com. [Learn why this is important](#)

Hello Ms. Barbara Peck,

Thank you for taking the time to read my letter. I am writing to protest PUD-1983. I live within 2 miles of the proposed Sunset Amphitheater, I could walk there.

The traffic around this area is already a nightmare. Roads are in bad repair. Construction for the needed road improvements will take years to complete, making congestion worse. I have worked in Civil Engineering in the past, so I have some insight into road and subdivision construction. Sara Road is still in process, and I hear 15th Street is will be the next for upcoming road surgery. These are the two roads, along with Mustang Road, that will bare the new expected volume of cars. This is unacceptable. How do you expect to accommodate the new volume of cars expected? Please, don't turn a blind eye.

There are many, many schools and churches in the surrounding area as well. During school, roads become overwhelmed with cars waiting to pick up or drop off little ones. Many of the students walk to some of these schools, and with trafficking so prevalent, this amount of "new visitors" causes me to be concerned for kids safety. Do you have children? Are they safe? Please, don't turn a blind eye.

I do expect a lot of noise disturbance, which is also unacceptable. I know low end vibrations will upset our sleep, and mess with our precious wildlife, pushed beyond what they should bear. Noise is one thing, vibration another. I've lived near O'Hare Field in Chicago growing up. Noise, yes, but no vibration. Big difference.

I am not comfortable either, with these concerts, inviting new crime into our area. Many have lived here their whole lives, and many of us have moved out here in the Yukon/Mustang area to get away from congestion, worsening crime, and some breathing room. Please, put yourself in our shoes.

Thank you again for taking your valuable time. May the Lord guide your heart in your decision.

Sincerely,

Jan Carr

kozcarr@me.com

843-412-4775

From: Dee Dee Burkhart <ufirstwithdd@live.com>
Sent: Saturday, March 30, 2024 9:58 PM
To: City Clerk Email <CityClerk@okc.gov>
Subject: Protest PUD-1983, Sunset Ampitheater

RECEIVED

By The City of Oklahoma City Office of the City Clerk at 9:47 am, Apr 01, 2024

You don't often get email from ufirstwithdd@live.com. [Learn why this is important](#)

I, Dee A. Burkhart, hereby protest PUD-1983 application by Mustang Creek Crossing LLC to rezone 810 South John Kilpatrick Turnpike.

One of the main problems that I have is that the rhythmic vibrations will be felt and annoying. Another problem will be the consistent and constant beating of the percussion instruments.

Just FYI: I used to live in Denver, and we could hear the annoyance of the concerts at the Red Rocks Ampitheater from miles away. There will be the same issues from the Sunset Ampitheater. I understand that there will be 40-60 concerts/events per year; and there is the great possibility that there will be more than that.

I live at the Savannah House of Yukon 62+ Community that is about two miles from the proposed building of the Sunset Ampitheater; and I am already stressed out that I most likely will have to move, due to the issues at hand; and I do not want that to happen: I am 70 years old.

- I am asking that you deny the rezoning of this PUD.

Sincerely,

Dee A. Burkhart
428 N. Willowood Drive
Apt 123
Yukon, OK 73099

From: Tiffany Burrington <tiffanyburrington@yahoo.com>
Sent: Saturday, March 30, 2024 4:26 PM
To: City Clerk Email <CityClerk@okc.gov>
Subject: Protest PUD-1983

You don't often get email from tiffanyburrington@yahoo.com. [Learn why this is important](#)

I, Tiffany Burrington, hereby protest PUD-1983 application by Mustang creek crossing LLC to rezone 810 South John Kilpatrick Turnpike.

I am a single parent , a nurse, and a resident of Westbury North since June 2021. I moved into this neighborhood because of the award-winning school district and the safety of living in a suburb (along with the convenience of the proximity to Oklahoma City). My children walk home alone from the bus stop, and I get home about 30 minutes after them. The potential increase in unfamiliar characters creates a danger in situations such as mine where I cannot get home earlier and my kids can't get home later.

Having Ubered through concert crowds at the Zoo Amphitheatre, and tried to find parking at the Rattlesnake Festival in Apache, I have seen the impact these crowds can have on small communities. Cars park up and down the streets, illegally and without permission, creating a hazard for any kind of emergency response or pedestrians. Because there will not be adequate parking, overflow will run into our neighborhood, causing an increase in crime and liability for home owners if someone injures themselves or someone else on their property.

Because I'm a nurse, getting up early and being able to sleep through the night is an integral part of my career in assisting people day in and day out and being able to assess and act quickly and efficiently for the safety of all my patients. Not only that, but from what I have seen, most of my neighbors are blue collar workers who keep essentially the same hours. Because of the location, it creates a multi-community reach. Most of us would work in Yukon, Oklahoma City, and Mustang. We get off work, take walks with our dogs and our children, and enjoy the simplicity of quiet evenings.

Aside from that, please consider the terrible traffic. Even before the street light was pulled down at 15th and Sara, traffic backs up there always in the afternoons and evenings with children getting out of school and quitting time traffic. And that is just regular traffic flow, not taking into consideration an additional potential 12,500 vehicles attempting to file into a 4,000 slot car park from side streets since there is not an exit off of I40 to Sara Rd. This would cause a HUGE influx of vehicles through sara, Morgan, mustang, Reno, and 15th streets. This endangers anyone who has an emergency on these very small byways, especially during these busy times.

I implore you to protect our neighborhoods and families from the dangers this venue will cause, and not just to our immediate community. Please deny this rezoning.

There is plenty of empty, non-residential area between Yukon and Piedmont or between Mustang and Tuttle which will not have even a fraction of the impact on so many peoples' home and work lives.

Thank you for all you do.
-Tiffany Burrington

From: Melanie Willoughby <mws12@hotmail.com>
Sent: Saturday, March 30, 2024 2:06 PM
To: City Clerk Email <CityClerk@okc.gov>
Subject: Protest PUD-1983, Sunset Amphitheater

RECEIVED

By The City of Oklahoma City Office of the City Clerk at 9:47 am, Apr 01, 2024

You don't often get email from mws12@hotmail.com. [Learn why this is important](#)

I, Melanie Willoughby, hereby protest PUD-1983 application by Mustang Creek Crossings, LLC to rezone 810 South John Kilpatrick Turnpike.

1. First problem I have is the low frequency vibrations affecting my rental property and tenant's peace. Please vote no to protect my investment and tenant's mental health.
2. Second problem I have is the traffic pollution due to lack of curfew enforcement, lack of green space and lack of traffic plan. Please vote no to protect my investment and safety.

I am the homeowner of property at 9613 SW 24th Terrace, OKC, OK 73128 and ask you to deny the rezoning of this PUD.

Respectfully,

Melanie Willoughby

405-761-9951

From: Jamie Crank <crnkyfamily@gmail.com>
Sent: Monday, April 1, 2024 8:53 AM
To: City Clerk Email <CityClerk@okc.gov>
Subject: Subject Line: Protest PUD-1983

RECEIVED

By The City of Oklahoma City Office of the City Clerk at 9:47 am, Apr 01, 2024

You don't often get email from crnkyfamily@gmail.com. [Learn why this is important](#)

Dear Councilmembers,

We, Ryan and Jamie Crank, hereby protest PUD-1983 application by Mustang Creek Crossing LLC to rezone 810 South John Kilpatrick Turnpike.

As Ward 3 residents in Castlebrook Crossing with three children (5,9,11) in the Mustang School system, this project will adversely affect our quality of life. After researching other facilities of this nature, it is apparent that the noise pollution alone will create hardship for our family and the thousands of residents in Ward 3.

Our oldest child will attend Mustang North Middle School next year. An Amphitheater right behind the school that has sound checks during the end of the day and concert preparations during after school activities does not foster a good learning environment.

The proposed Amphitheater would host concerts from April through October. That schedule includes 5 months of school. Our children need to be supported so that they can reach their highest potential. This venue would cause only distractions and disruption to that goal.

We urge the council to consider the residents in this matter. Please do not approve PUD-1983.

Thank you,

Ryan and Jamie Crank

2616 Ryder Dr.

Yukon, OK 73099

From: Terry Bradfield <bradfield.terry@gmail.com>
Sent: Monday, April 1, 2024 4:50 PM
To: City Clerk Email <CityClerk@okc.gov>
Subject: Protest PUD-1983

RECEIVED

By The City of Oklahoma City Office of the City Clerk at 8:54 am, Apr 02, 2024

You don't often get email from bradfield.terry@gmail.com. [Learn why this is important](#)

I, Debra Bradfield, hereby protest the PUD-1983 application of Mustang Creek Crossing LLC to rezone 810 South John Kilpatrick Turnpike.

This proposed development is not good for our neighborhoods/or community because:

1. THE NOISE

Many of us moved to this area because of the peaceful serenity. Some of these neighborhoods were established decades ago. The proposed venue will be too close to the surrounding homes, two Mustang Public Schools & a local church. The sounds from this venue cannot be contained, being heard at distances up to 4 miles. Some of the local residents are elderly & some others have health issues that could be adversely affected by potential noise from a venue of this type.

2 THE TRAFFIC CONGESTION

This area is experiencing growth & the current roads are not able to adequately move the traffic now. Unless the current roads are dealt with, the problem will only escalate. There is an issue of parking for the venue. The proposal is for 3500 parking spaces, which is not adequate of a venue capacity of 12,000 +. The nearby streets & neighborhoods could become parking by proxy.

3. PLEASE CONSIDER the citizens who reside in this area. I urge you to drive through this area to see how close this is to the neighborhoods & schools.

ask yourself if this proposed venue is beneficial to the residents?

How will this affect their daily lives?

Would you personally want such a venue in YOUR peaceful tranquil neighborhood?

Please put yourself in the shoes/homes of the residents.

I am asking you to vote "NO" on PUD-1983.

Please do this for the citizens/residents who would be greatly affected by the proposed venue.

Thank you,

Debra Bradfield

I am the homeowner at:

11804 SW 2nd St.

Yukon, OK 73099

405-577-5050

bradfield.terry@gmail.com

RECEIVED

By The City of Oklahoma City Office of the City Clerk at 8:54 am, Apr 02, 2024

From: Smith, Samuel <Samuel.Smith@Mercy.Net>
Sent: Tuesday, April 2, 2024 5:34 AM
To: City Clerk Email <CityClerk@okc.gov>
Subject: Protest PUD-1983, Sunset Ampitheater

You don't often get email from samuel.smith@mercy.net. [Learn why this is important](#)

To: Oklahoma city council , mayor and city clerk

I am Samuel Smith, the homeowner of 1609 Edinburg Dr. and I hereby **protest PUD-1983** application by Mustang Creek Crossings, LLC to rezone 810 South John Kilpatrick Turnpike. Our neighborhood is a very peaceful and quite area in which my family and I have lived for 23 years. The Sunset Ampitheater should not be allowed in proximity to a residential area due the **noise** and other **disruptions to the quality of life** in not just my neighborhood but many other surrounding nieghborhoods as well. The citizens of this area have an expectation that the *zoning rules put into place are there to protect citizens from the very kind of disruptions of quality of life that the rezoning proposed by PUD-1983 will allow.*

Thank you for your time and consideration in this matter, Samuel Smith

This electronic mail and any attached documents are intended solely for the named addressee(s) and contain confidential information. If you are not an addressee, or responsible for delivering this email to an addressee, you have received this email in error and are notified that reading, copying, or disclosing this email is prohibited. If you received this email in error, immediately reply to the sender and delete the message completely from your computer system.

RECEIVED

By The City of Oklahoma City Office of the City Clerk at 8:54 am, Apr 02, 2024

From: Robert & Shirley Syms <mercy.house@yahoo.com>
Sent: Monday, April 1, 2024 11:10 PM
To: City Clerk Email <CityClerk@okc.gov>
Subject: Protest PUD-1983

You don't often get email from mercy.house@yahoo.com. [Learn why this is important](#)

First, thank you for serving the resident in our city. I know that the Council Member's compensation is not a full-time job worth, yet you have a heavy responsibility on your shoulders. I am writing to protest PUD-1983 at 810 South John Kilpatrick Turnpike.

There is a 12,500 capacity amphitheater proposed to be built less than a mile from our home. Mr. Sam Coury and Ms. Carol Hefner plan to sell their land to this multi-million dollar company and thousands of families will be affected by this.

Upon doing research of other amphitheaters built near neighborhoods like mine, we found numerous complaints from residents who reside anywhere between a mile to 20 miles. Here are some of the complaints: windows rattling, walls shaking, picture frames vibrating, interference with watching tv, feeling the low frequency bass sounds, inability to sleep for children and adults, inability to enjoy their own homes, distracted family time, hearing profanities blasted out the speakers, increase in littering, increase in crime, decrease in property values, and an increase in high volumes of traffic.

Most of these complaints are from miles away. We can supply information for all the articles we have found.

When you investigate the health effects of noise pollution, which the government recognizes as something serious and fights against other issues, it's frustrating and disheartening. An article in the Gainesville Sun concerning issues with their amphitheater, they reported that, "Intrusive noise can lead to cardiovascular disease, sleep disruption, reduced productivity, impaired teaching and learning, absenteeism, increased drug use and accidents. It adversely affects general health and well-being, increases anti-social behavior. Future generations are harmed by degraded home, social and learning environments, with corresponding economic loss."

This is very concerning to my family because it not only affects our health and well being, but also affects our neighbors within a 10-20 mile radius.

My parents are the homeowners and I am on the deed at 10413 Hollyhead Way ~ Yukon, OK 73099. We are asking you to vote NO on PUD-1983 on behalf of your constituents' health, well-being and safety. As mentioned, the hazardous effects of this venue close in proximity to homes will impact thousands of lives, not once, not 10 times, but 50-60 times a year.

We are fully aware that millions of dollars in revenue will come into the city through this venue, but at the expense of Oklahomans. It's down right rude and inconsiderate to see your own people's well-being to bring in money. And also there's plenty of other venues in this great city such as Scissortail Park, Paycom, and the Zoo Amphitheater. Reject these plans until a plan is presented that does not jeopardize Oklahomans freedom to enjoy their families and homes in quiet.

Thank you for looking into this serious matter. I know you have a heavy responsibility and have a full plate.

Sincerely,

Shirley Luk,
Freddy Man Chu Luk
Ladia Luk

From: Bob Bruce <bob.bruce@live.com>
Sent: Monday, April 1, 2024 9:46 PM
To: City Clerk Email <CityClerk@okc.gov>
Subject: Protest PUD-1983, Sunset Amphitheater

RECEIVED

By The City of Oklahoma City Office of the City Clerk at 8:54 am, Apr 02, 2024

You don't often get email from bob.bruce@live.com. [Learn why this is important](#)

To Amy Simpson,

My name is Bob Bruce. I have lived in Ward 3 of OKC for the past 17 years. I am writing in protest to PUD-1983 at 810 South John Kilpatrick Turnpike. My concerns relate to a proposed amphitheater to be located near SW 15th Street and Sara Rd.

1. The 12,500-seat outdoor concert venue will be located very close to Mustang Creek Elementary and Mustang North Middle Schools. The concert stage will only be 450 feet from the running track by North Middle School. During concerts, it will be impossible to have quality school time or extracurricular activities at Creek Elementary and North Middle Schools. The low frequency bass and vibrations will disrupt school functions. Concerts will be allowed to proceed until 10:30pm or 11pm. Children living in the surrounding community will not be able to sleep well during concerts. This amphitheater will impact the performance of children attending Mustang Public Schools.
2. PUD-1983 removes OKC noise permit requirements. The only limitation of noise levels will be at the volition of the concert venue operator. For a normal concert event in OKC, the applicant must get a noise permit for each event, and the OKC city manager can approve, deny, or even revoke a noise permit. PUD-1983 bypasses this requirement and eliminates OKC's ability to control noise levels.
3. This is a land use issue. The land north of Creek Elementary and North Middle Schools is not currently zoned for amphitheater use. PUD-1983 aims to rezone the land for amphitheater use. It is not appropriate for an amphitheater to be located near a school.

After \$100 million is spent on constructing the amphitheater, it will be too late for objections. The schools and surrounding residents will simply have to live with the noise or move. Now is the time for action to stop the proposed amphitheater rezoning. I own and live at 1601 Birkenhead Rd, and I request the OKC council to deny and reject PUD-1983.

Sincerely,

Bob Bruce
1601 Birkenhead Rd
Yukon, OK 73099
405-808-2418

RECEIVED

By The City of Oklahoma City Office of the City Clerk at 8:54 am, Apr 02, 2024

-----Original Message-----

From: Karen <kag7958@yahoo.com>
Sent: Monday, April 1, 2024 8:17 PM
To: City Clerk Email <CityClerk@okc.gov>
Subject: PROTEST PUD-1983

[You don't often get email from kag7958@yahoo.com. Learn why this is important at <https://aka.ms/LearnAboutSenderIdentification>]

Dear City Clerk Amy Simpson,

I, Karen Giddings, hereby protest the PUD-1983 Application by Mustang Creek Crossing LLC to rezone 810 South John Kilpatrick Turnpike. My husband Gary and I have owned our home for over 15 years at 2121 Hackberry Creek Avenue, Yukon, Oklahoma, 73099, Mustang Creek Addition which is in Ward 3.

Our home is within 1 mile of this rezoning and if passed, we will be within 1 mile of the proposed Sunset Amphitheater. There are many reasons I oppose a 12,500 seat amphitheater at this proposed location, but the main reason is the NOISE it will generate.

The noise from concerts including the screaming and applause from the audience is what concerns me. We currently hear the racing cars from the Kilpatrick Turnpike in our home. I can only imagine we will hear the amplified music, instruments, and pounding bass in our living room when are trying to enjoy a quiet evening at home. It will affect not only me, but hundreds of lives of nearby families surrounding this area.

If the City Council approves the rezoning change, there will be no stopping the noise generated by the proposed amphitheater once it begins which will be unending. Unfortunately I believe that no amount of desperate noise complaints to the police, and no number of tearful please to the City Council will help us once the amphitheater is built. We need to STOP IT NOW!

I encourage all Councilpersons to vote NO to the proposed rezoning of PUD-1983.

Thank you.

Karen Giddings
(580) 591-0547

Sent from my iPad

From: Chuck Lemon <chuck.lemon@att.net>
Sent: Monday, April 1, 2024 8:02 PM
To: City Clerk Email <CityClerk@okc.gov>
Subject: Protest PUD-1983 Sunset Amphitheater

RECEIVED

By The City of Oklahoma City Office of the City Clerk at 8:54 am, Apr 02, 2024

You don't often get email from chuck.lemon@att.net. [Learn why this is important](#)

WARNING: The sender of this email could not be validated and may not match the person in the "From" field..

Amy,

I Chuck Lemon herby protest PUD-1983 by Mustang Creek Crossing,LLC to rezone 810 South John Kilpatrick Turnpike.

My concern is this will be frequent nuisance and suggest they move farther West if they want to build it. There is ample room and not many residence just three miles west.

I respectfully ask. Would you want this Amphitheater build near your home?
If not, please vote No.

I'm the homeowner of 2112 Dogwood Creek and I ask you to vote against the rezoning of PUD-1983

Pease Reply so I will know you received this.

Thank You

RECEIVED

By The City of Oklahoma City Office of the City Clerk at 8:54 am, Apr 02, 2024

From: monte.ek51@gmail.com <monte.ek51@gmail.com>

Sent: Monday, April 1, 2024 7:51 PM

To: City Clerk Email <CityClerk@okc.gov>

Subject: Protest PUD 1983

You don't often get email from monte.ek51@gmail.com. [Learn why this is important](#)

I, Monte Kennedy hereby protest PUD 1983 rezoning applications. Please protect our neighborhoods from the dangerous noise levels and extreme traffic issues.

Sent from my LG K30, an AT&T 4G LTE smartphone

RECEIVED

By The City of Oklahoma City Office of the City Clerk at 8:54 am, Apr 02, 2024

From: Rayce Watson <rayce.watson@gmail.com>

Sent: Monday, April 1, 2024 7:36 PM

To: City Clerk Email <CityClerk@okc.gov>; Ward3 <ward3@okc.gov>

Subject: protesting letter for rezoning for PUD-1983

Some people who received this message don't often get email from rayce.watson@gmail.com. [Learn why this is important](#)

I, Rayce Watson, owner of 1245 Edinburg Drive, Yukon, Ok. 73099, hereby protest the proposed PUD-1983 by Mustang Creek Crossing LLC to rezone 810 South John Kilpatrick Turnpike, Oklahoma City.

I have several concerns about this proposal that would warrant a no vote. This property abuts a public elementary school and a middle school. Both of which will still be in session during sound checks and have afterschool activities.

As a homeowner in the nearest neighborhood, I also do not believe they have allocated enough parking spaces. There are no other businesses, schools, church parking lots that will be able to handle the overflow which I believe will clog our neighborhood with cars parking to go to the concert. These will be diverted from South Sara Road which is two-lane.

My largest concern is that I won't be able to enjoy my own backyard on weekends during concert season. As close as this property is to mine, I do not believe the bass can be contained so that I can maintain my current lifestyle in my own home.

I'm asking for a NO vote to the proposed rezoning for PUD-1983.

Respectfully,

Rayce Watson

From: laree crossland <lareecrossland@yahoo.com>
Sent: Monday, April 1, 2024 6:23 PM
To: City Clerk Email <CityClerk@okc.gov>
Subject: Protest PUD-1983

RECEIVED

By The City of Oklahoma City Office of the City Clerk at 8:54 am, Apr 02, 2024

You don't often get email from lareecrossland@yahoo.com. [Learn why this is important](#)

Dear Ms. Simpson

I want to protest the PUD-1983 application by Mustang Creek Crossing LLC to rezone 810 South John Kilpatrick Turnpike for the following reasons.

First of all, because of the excess traffic that already exists in this area, EMSA and the Police and Fire Departments can take up to an hour to reach a destination. It would add an additional burden to this area if 12,500 people flocked to one destination all at once. Even widening the roads would not help in certain areas especially on S.W. 15th Street from Sara Rd. to Garth Brooks. Mustang Rd., Czech Hall, and Garth Brooks have heavy traffic as it is. Those streets would be used as alternative routes to get to the amphitheater which would cause even more traffic congestion in this area. Also, at certain times of day, the Kilpatrick exit ramp at S.W. 15th Street is extremely backed up several cars deep onto the turnpike itself. There are people who like to use drugs and alcohol before, during, and after concerts. Impaired drivers traveling to and from an amphitheater would certainly add to our existing traffic problems.

Secondly, residents near the site in question, have spent millions of dollars on their homes collectively, and to be exposed to extreme noise and vibrations for hours until 10:30 and 11:30 at night, is unthinkable and unacceptable. Some of those concerts would disrupt the sleep of children living nearby, and they would go to school tired the next day. That's not right nor is it fair to intrude upon children's sleep time. A venue which emits loud

noises and is built near existing housing additions breaches the understood Oklahoma Law of “Quiet Enjoyment” which entitles property owners or tenants the right to enjoy their property without interference. Loud noise and vibrations can cause interference within a four mile radius. I don’t care what state of the art equipment they say they have, it cannot stop outdoor noise at that level from being projected into the environment. What is even more concerning is that the OKC Planning Commission granted a 5 db increase over the city’s sound ordinance for this area. Why isn’t the city’s normal sound level good enough? I heard the amphitheater would do its equipment testing during the hours the elementary school next door is in session. Testing of the amphitheater’s equipment next to the school would be disruptive to the students and their learning.

Thirdly, the Sunset Amphitheater’s plan lacks adequate parking compared to amphitheaters of the same size. Sunset’s parking plan is for 12,500 people with 3,500 parking spaces. There is a comparable amphitheater called Toyota Amphitheater at Concord, California, which is operated by Live Nation. That amphitheater holds 12,500 people, but it has 8,000 parking spaces. That’s a difference of 4,500 spaces. The elementary school next door to the site in question doesn’t have enough parking spaces available to accommodate 4,500 vehicles. Also, the use of the school’s parking lot could put young students at risk. Concert goers will at times discard drug paraphernalia and other unwanted items from their cars. What would happen if an innocent child picked up trash that contained fentanyl or some other drug that could be lying in the school’s parking lot? The parking problem is a big issue. Where is Sunset Amphitheater going to get the extra parking? If there is not convenient and adequate parking for that type of a facility, people will park wherever they want. They will park onto nearby roads or inside nearby neighborhoods and in front of private residences within

walking distance of the venue. With the drugs, alcohol and crime that music venues bring, it would be wrong to expose innocent homeowners and their families to such unwelcomed elements. A venue must have adequate parking for its size. Sunset has no precise or definite plans for adequate parking which is unacceptable.

In closing, I moved here several years ago because this community was safe and quiet. I want this area to remain that way. I have invested a lot of time, effort, and money into my home. I just don't want the extra traffic that would be continual, congested, and at times unsafe that an amphitheater would bring. Also I don't want the drugs, alcohol, and crime near my home that result from the culture of an amphitheater. An amphitheater would cause many of the citizens in this area harm emotionally as well as financially. The value of our homes could suffer greatly. Most home buyers would not want to purchase a home near a venue that emitted such extreme, obnoxious noise or vibrations to occur in a home for hours at a time. It would be an interference in people's lives, and it could make it very difficult to sell a compromised home even at a discounted price. Few people would want an amphitheater built near their existing home or neighborhood. I don't for sure. Please do not allow the land to be rezoned to accommodate an amphitheater for the reasons listed above.

Again, I want to protest PUD-1983.

Respectfully,

Laree Crossland
11721 S.W. 18th
Yukon, Oklahoma 73099

RECEIVED

By The City of Oklahoma City Office of the City Clerk at 11:50 am, Apr 04, 2024

From: myrna morse <mm6102@yahoo.com>

Sent: Thursday, April 4, 2024 11:42 AM

To: City Clerk Email <CityClerk@okc.gov>

Subject: Application by Mustang Creek Crossing LLC to rezone 810 S. John Kirpatrick PUD 1983

You don't often get email from mm6102@yahoo.com. [Learn why this is important](#)

April 04, 2024

To City Council Members:

I have been in the neighborhood for over 30 years and have seen a lot of changes, but I think you would do an injustice to approve the development of the Amphitheater. The road they plan to use is only a narrow two lane that cannot handle the proposed traffic to their events. Please disapprove at your April 9th meeting and do what's right not what's easy.

Myrna Morse
9904 Sudbury Rd.
Yukon, OK 73099

Smiley, Dena L

From: PL, Subdivision and Zoning
Sent: Friday, April 5, 2024 11:41 AM
To: City Clerk Email; Smiley, Dena L
Subject: FW: Exhibits for 4-9-24 City Council hearing; PUD-1983
Attachments: Exhibit 1.pdf; Exhibit 2.pdf; Exhibit 3 - AOK_Work_Overall.pdf



Thad A. Johnson
Senior Planner

Planning Department, Subdivision and Zoning
420 West Main Street, Suite 910, OKC, OK 73102
Ph: (405) 297-2495 – Fax: (405) 316-2495

2024 APR 5 PM 2:05
OKLAHOMA CITY CLERK

From: Katrina Coshow <katrinapetschel@yahoo.com>
Sent: Friday, April 5, 2024 11:17 AM
To: Martin, Jared J <jared.martin@okc.gov>
Cc: Kelly Work <jkwork225@gmail.com>; PL, Subdivision and Zoning <Subdivisionandzoning@okc.gov>
Subject: Exhibits for 4-9-24 City Council hearing; PUD-1983

Jared,

Please find attached the visual exhibits to be presented during the PUD-1983 matter for the April 9th City Council hearing. Please confirm receipt.

1. Exhibit 1 - Table of sound level limits;
2. Exhibit 2 - Section 9.18 pf the PUD-1983 MDS; and,
3. Exhibit 3 - Aerial photo

Katrina Coshow, SHRM-CP, Legal Assistant
J. Kelly Work, Attorney at Law
High Tower Building
105 North Hudson Avenue, Suite 304 Oklahoma City, Oklahoma 73102 Phone: 405-232-2790
Fax: 405-232-3966

§ 34-12. Table of sound level limits.

The following table shall apply to the provisions of this chapter:

TABLE I. LIMITING SOUND LEVELS FOR LAND USE DISTRICTS

| Zoning district classifications | time | percentile sound level limits, dBA | |
|--|----------------------|---------------------------------------|----------|
| | | L^{90} | L^{10} |
| R-A, RA-2, R-1, HP, R-1ZL, R-2, R-3, R-3M, R-4, R-4M, R-MH-1, R-MH-2, NC*, C-CBD*, PUD*, SPUD*, CUP*, BC*, NB*, DBD*, DTD-1*, DTD-2* (residential) | 7:00 a.m.—10:00 p.m. | 55 dBA | 65 dBA |
| | 10:00 p.m.—7:00 a.m. | 50 dBA | 60 dBA |
| O-1, O-2, RC, C-1, C-2, C-3, C-4, C-CBD*, C-HC, SYD, NC*, PUD*, SPUD*, CUP*, BC*, NB*, DBD*, DTD- 1*, DTD-2* (commercial or business) | 7:00 a.m.—10:00 p.m. | 60 dBA | 70 dBA |
| | 10:00 p.m.—7:00 a.m. | 55 dBA | 65 dBA |
| AA, TP, I-1, I-2, I-3, PUD*, SPUD*, CUP*, BC*, DBD*, DTD-1*, DTD-2* (industrial or agricultural) | 7:00 a.m.—10:00 p.m. | 70 dBA | 80 dBA |
| | 10:00 p.m.—7:00 a.m. | 70 dBA | 80 dBA |

*The Director shall make a determination on CUP, PUD, SPUD, NC, C-CBD, BC, NB, DBD, DTD-1 and DTD-2 zoning districts as to their classification.

(Code 1980, § 34-12; Ord. No. 19581, § 7, 5-29-91; Ord. No. 24036, § 1, 3-23-10)

THE CITY OF OKLAHOMA CITY
PLANNED UNIT DEVELOPMENT DISTRICT
PUD-1983

MASTER DESIGN STATEMENT FOR

Notes Live

November 2, 2023
January 3, 2024
January 5, 2024
January 15, 2024

PREPARED FOR:

Notes Live
1755 Telstar Drive.
Suite 501
Colorado Spring, CO 80920
bmudd@noteslive.vip

PREPARED BY:

WILLIAMS, BOX, FORSHIE & BULLARD P.C.
David Box
522 Colcord Drive
Oklahoma City, OK 73102
405-232-0080 Phone
405-236-5814 Fax
dmbbox@wbflaw.com

9.15 PUBLIC IMPROVEMENTS

Public improvements shall be made by the property owner throughout the PUD as required by the City of Oklahoma City Public Works Department or other City, County, or State Department or agency. All Local, State, and Federal ordinances as they shall apply to the site will be adhered to fully.

9.16 COMMON AREAS

Maintenance of the common areas in the development shall be the responsibility of the property owner or Property Owners Association. No structures, storage of material, grading, fill, or other obstructions, including fences, either temporary or permanent, that shall cause a blockage of flow or an adverse effect on the functioning of the storm water facility, shall be placed within the common areas intended for the use of conveyance of storm water, and/or drainage easements shown. Certain amenities such as, but not limited to, walks, benches, piers, and docks, shall be permitted if installed in a manner to meet the requirements specified above.

9.17 SPECIFIC PLAN

No building permits shall be issued in this PUD until a Specific Plan, including all items listed in Section 59-14150.D. of the Oklahoma City Municipal Code, 2020, as amended shall have been approved by the Planning Commission.

9.18 OTHER

Live music and amplified sound shall be prohibited after the following times:

Sunday through Thursday after 10:30 p.m.

Friday and Saturday after 11:00 p.m.

*Sound checks are not permitted prior to 2:00 p.m. on days in which school is in session

The amphitheater is expected to establish operational maximum sound levels for performances in accordance with Exhibit "E" and if performances exceed these levels, active steps shall be taken to reduce noise levels.

- Noise monitoring shall be conducted during performances at the eastern boundary of this PUD and northwest at the residential boundary across John Kilpatrick. Sound detection devices will be installed as noted in the attached Exhibit "G" to provide for operational intervention in the event the limits were being exceeded. Sound detection monitors shall be calibrated annually. Third party sound monitoring results shall be transmitted to the City of Oklahoma City on a quarterly basis.
- The limits at the above-referenced boundary lines are expected as follows:
 - An L10 exceeding 70dB(A) in any 30-minute period.
 - An L90 exceeding 60dB(A) in any 30-minute period.
- Should noise levels exceed those documented above, the venue operator would promptly inform the event production team and instruct the event production team to reduce noise levels to a level appropriate to maintain the requirements.

- Event production teams shall be obligated by their contracts to comply with the venue operator's directions and shall be subject to prematurely terminating events if the performance remains out of compliance.
- Noise permits shall not be required for concerts within this PUD.

10.0 DEVELOPMENT SEQUENCE

Developmental phasing shall be allowed as a part of the development of this PUD.

11.0 EXHIBITS

The following exhibits are hereby attached and incorporated into this PUD. These exhibits are:

- Exhibit A1-A-3: Legal Descriptions
- Exhibit B: Conceptual Master Development Plan
- Exhibit C: Topography Plan
- Exhibit D: Attached Sign Exhibit
- Exhibit E: Noise Study
- Exhibit F: Landscape Plan
- Exhibit G: Placement of Sound Detection Devices

AERIAL
PHOTOGRAPHY



Smiley, Dena L

From: Graham, Miki D on behalf of City Clerk Email
Sent: Friday, April 5, 2024 10:49 AM
To: Smiley, Dena L
Subject: FW: Protest PUD-1983
Attachments: McMillin Protest Letter.pdf

Miki Graham, MM/PA, CMC
Assistant City Clerk
The City of Oklahoma City
405-297-2396
Miki.graham@okc.gov

2024 APR 5 AM 10:53
OKLAHOMA CITY CLERK

From: Michael McMillin <mcmillin_michael@yahoo.com>
Sent: Friday, April 5, 2024 10:41 AM
To: Ward3 <ward3@okc.gov>; City Clerk Email <CityClerk@okc.gov>; Dara K. McMillin <darakm@yahoo.com>
Subject: Protest PUD-1983

You don't often get email from mcmillin_michael@yahoo.com. [Learn why this is important](#)
Please find our attached letter. Thank you.

RE: Protest PUD-1983

We, Michael and Dara McMillin, hereby protest PUD-1983 application by Mustang Creek Crossing LLC to rezone 810 South John Kilpatrick Turnpike. We are current residents of the area, residing at 411 Cactus Road in Yukon, and have lived at our current address for over 10 years.

Our first concern is the location. The proposed location is adjacent to two schools. From our understanding, sound checks and setup could occur during school hours. Not only would this be severely disruptive to those schools, but we would also expect an increased security concern for those students. There would be so many individuals required for the setup of these concerts and with the schools so close, anyone could wander over to the campus. Additionally, as you have people arriving early for the concert, traffic will increase causing issues for parents picking up children from school, could cause an increase in traffic accidents, and endanger the lives of the students. It is disappointing that such a venue would even be considered in such close proximity to these schools.

Another concern we have is general traffic flow. The Yukon/Mustang area is expanding and is expanding quickly. The current road infrastructure is barely sufficient to accommodate the current flow of traffic, much less accommodating the traffic a new amphitheater would bring. Yukon is surrounded by two lane roads in the area where this new amphitheater would be placed. As far as we are aware, there are not any plans to expand these roads. During certain times of the day, it is not unusual for us to be waiting 20 minutes or longer at certain crossroads due to the traffic congestion.

For those who are closer to the venue, we imagine the sound levels will be quite a concern. We will admit that because we are far enough away, that may not be a huge issue. But, still might cause some problems. We have special needs children who have problems with sleep. Increased sounds at night will cause problems for them and they do not need that.

We do know that a venue such as this can bring revenue to our community. But, the location is not ideal for our community. Surely another location can be identified that does not cause the issues noted above. Therefore, we protest PUD-1983 application by Mustang Creek Crossing LLC to rezone 810 South John Kilpatrick Turnpike. Thank you for your consideration.

Michael and Dara McMillin
411 Cactus Road
Yukon, Oklahoma 73099
(405) 620-7548

Smiley, Dena L

From: Wrights, David R III on behalf of City Clerk Email
Sent: Friday, April 5, 2024 12:00 PM
To: Smiley, Dena L
Subject: FW: Detailed protest report, PUD 1983
Attachments: PUD_1983_issues_report_final_2.pdf

David Wrights

2024 APR 5 PM 12:14
OKLAHOMA CITY CLERK

From: Dennis Beringer <dr_who@swbell.net>
Sent: Friday, April 5, 2024 11:54 AM
To: City Clerk Email <CityClerk@okc.gov>
Subject: Detailed protest report, PUD 1983

You don't often get email from dr_who@swbell.net. [Learn why this is important](#)

WARNING: The sender of this email could not be validated and may not match the person in the "From" field..

Ms. Simpson,
Please find attached my detailed report, as promised to our Ward 3 representative, detailing the issues related to PUD 1983. This is a detailed update of my original message to the Planning Commission.

Thank you,
Dennis B. Beringer
10237 Bonnycastle Drive
Yukon, OK. 73099

-----=
1 PDF attached

Problematic Issues, PUD 1983 (Amphitheater)
Prepared by Dennis B. Beringer, Ph.D., retired Senior Scientist*
for The City Council, The City of Oklahoma City

Executive Summary

Consideration of the land use specified in PUD 1983, in the close proximity of residential areas, schools, and a church, raises a number of issues that need to be carefully considered. The two reports attached to the subject PUD were evaluated and analyzed. Concurrently a search for related documents and the documentation of problematic issues encountered at similar venues was conducted, and produced a variety of topics, some of which were noted repeatedly across sources. The major topics are as follow:

Noise: The venue will generate noise that can and will propagate into the surrounding residential areas. Data from the analysis provided by the applicant indicate that the low-frequency sounds (and likely impulsive sounds) implicated in noise complaints near other amphitheater facilities *cannot be mitigated* and will likely cause effects anywhere from 1 up to 3 miles from the facility (per operational experience at other amphitheaters that had promised or attempted similar noise-control approaches). Additional noise will be present from the traffic entering and leaving the facility and from the possible 12,500 attendees.

Traffic: Current road infrastructure is not sufficient to effectively handle the expected traffic loads. Bottlenecks (two-lane roads) exist on SW 15th west of the tollway and on Sara Road between SW 15th and the overpass bridge crossing I-40. Funding is not in place to widen that portion of Sara and that solution would not be available prior to the facility starting operation. SW 15th widening is scheduled to start farther west and work back towards the tollway, which would also not likely be in place in time.

Parking: The number of spaces specified appears low and the estimate of ride-share attendees (30%) appears high for this area. Relief from having tree islands was granted in revised PUD, making heat retention on the property more likely with effects likely to influence the surrounding area. It can be expected that there will be spillover of traffic/parking into the adjacent neighborhoods (including school and church properties).

Compatible land use: The likelihood of nuisance noise spilling over into the adjacent residential areas was determined to be a certainty, and this was based on known properties of sound and the operational records of other facilities of similar (and smaller) size. As such, this did not appear to constitute compatible land use given the close proximity to residential areas.

After careful examination of the various topics at a detailed level, and taking into account both operational experience and attempted/recommended remedies, it was concluded that immediate and effective solutions for all of the relevant issues raised in the review were not available, and that there would be negative effects experienced by nearby residents.

*(*Formerly Senior Scientist at the Civil Aerospace Medical Institute)*

Table of Contents

| | |
|---|-----------|
| Executive Summary | 1 |
| Background | 3 |
| Noise..... | 3 |
| Lower-frequency sound and propagation..... | 3 |
| Noise level compared with traffic noise | 4 |
| Operational record of amphitheaters..... | 5 |
| Calibration Procedure for Noise Sensors | 6 |
| Inappropriateness of A-scale weighting | 7 |
| How current measurements fail..... | 7 |
| Applicant Requested Changes to Noise Code | 9 |
| Performance Type and Noise Complaints | 10 |
| Effects on domestic animals..... | 11 |
| Sound levels and performer/attendee expectations | 11 |
| Factors that may limit noise control effectiveness..... | 11 |
| o Fines..... | 11 |
| o Type of sound equipment..... | 11 |
| o Venue self monitoring | 11 |
| Other Factors | 12 |
| Traffic | 12 |
| Parking | 12 |
| Formation of heat island | 13 |
| Light pollution..... | 13 |
| Flood control, drainage, Mustang Creek..... | 13 |
| Roads/streets | 14 |
| Hours/days of operation | 14 |
| Size of venue relative to other well-known venues | 15 |
| Security and law enforcement | 15 |
| Values of surrounding properties | 15 |
| Compatible Land Use..... | 16 |
| Summary..... | 17 |
| References | 17 |
| Links..... | 18 |
| Appendix..... | 20 |

Background

A proposal has been submitted, in PUD 1983, to construct a 12,500 person capacity amphitheater in close proximity to two schools, two existing residential areas, two more under construction, and existing apartment complexes. The submission of this proposal raised questions regarding the noise that would be generated, to what degree it would affect local residents, the traffic and congestion associated with operation, and a list of other topics. A brief one-page listing of 6 topical areas related to these issues was presented to the Planning Commission on January 11, 2024 with the intent that these topics would be carefully considered in discussion about and voting on the proposal. This did not occur at the commission meeting, and issues raised by the City Staff Report were also not discussed. Given these facts and comments made by the chair and members of the commission indicating that they were not conversant in the topic of noise and sound propagation (see video record of commission meeting), this report was compiled to (1) explain, in detail, the specifics of the noise issues so that they may be fully understood, (2) to illustrate some potential shortcomings in the reports submitted in the PUD and point out issues raised the Staff Report, and to briefly outline other topical areas that did not appear to be fully resolved in the revisions to the PUD or to necessarily be resolvable.

Noise

Lower-frequency sound and propagation

The noise study provided by the applicant indicates an inability to moderate the propagation of low-frequency sounds (Table A1 in the Appendix), which will thus propagate into the adjacent areas, both in the table of forecast data (numerical dB values) and in the text accompanying the table. This would include impulse-type (percussive) noises. There is also a question as to how truly effective the noise-moderating strategies will be in moderating noise propagation to the northwest of the venue (adjacent apartments). Walls/fences mentioned at the meeting of the Planning Commission will not affect the transmission of low-frequency noise (Figure 1) and lower frequencies will be less attenuated than higher frequencies (Figure 2; see Van Cott & Kinkaid, 1972; World Health Organization, 1999).

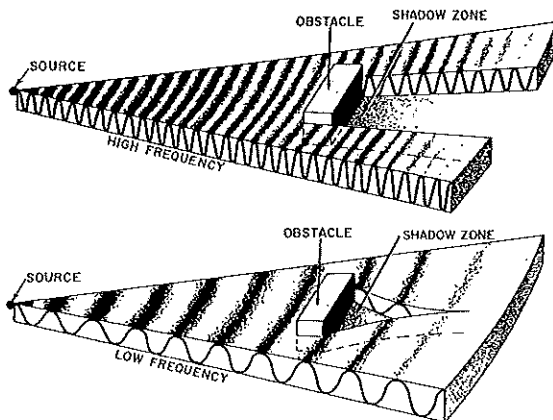


Figure 1. Low frequencies diffracting around barriers.

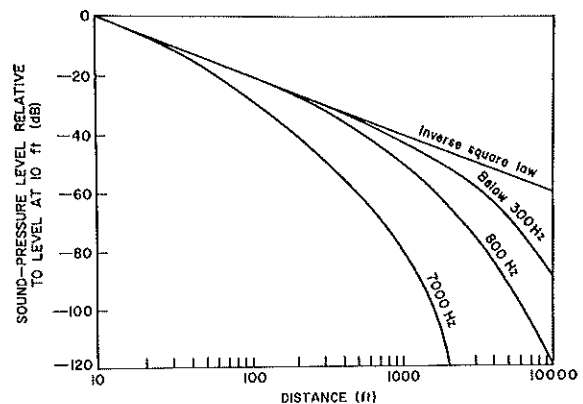


Figure 2. Attenuation of three frequencies, including a

Noise level compared with traffic noise

In discussions and presentations, the applicants said that the noise generated at the amphitheater would be no worse than (not less than; implies equivalent to) the traffic noise from the tollway and I-40. The proposed amphitheater is immediately adjacent to the tollway. One might then believe that this would require that the venue will have to produce sounds at a level in excess of the ambient traffic noise. If that is so, then that would seem to imply that the sound levels at the source (venue) will actually be higher than those of the traffic noise.

Either of these things logically imply that the noise from the venue could then be heard everywhere that traffic noise can presently be heard (greater than a one-mile radius, Figure 3; some effects at existing facilities have been reported at greater distances including 2 and 3 miles or more; See Operational record of amphitheaters). During morning rush hour, traffic noise from the tollway and I-40 can be heard, in Westbury South, inside residences over a mile from the proposed venue site. At this distance, approximately 6500 people at a minimum could be affected (Table A2 in the Appendix; Figure 4 shows the overlap of the one-mile radius about the proposed site and the one-mile radius around the intersection of SW 15th and Mustang Road used as the basis for the population value in Table A2.)

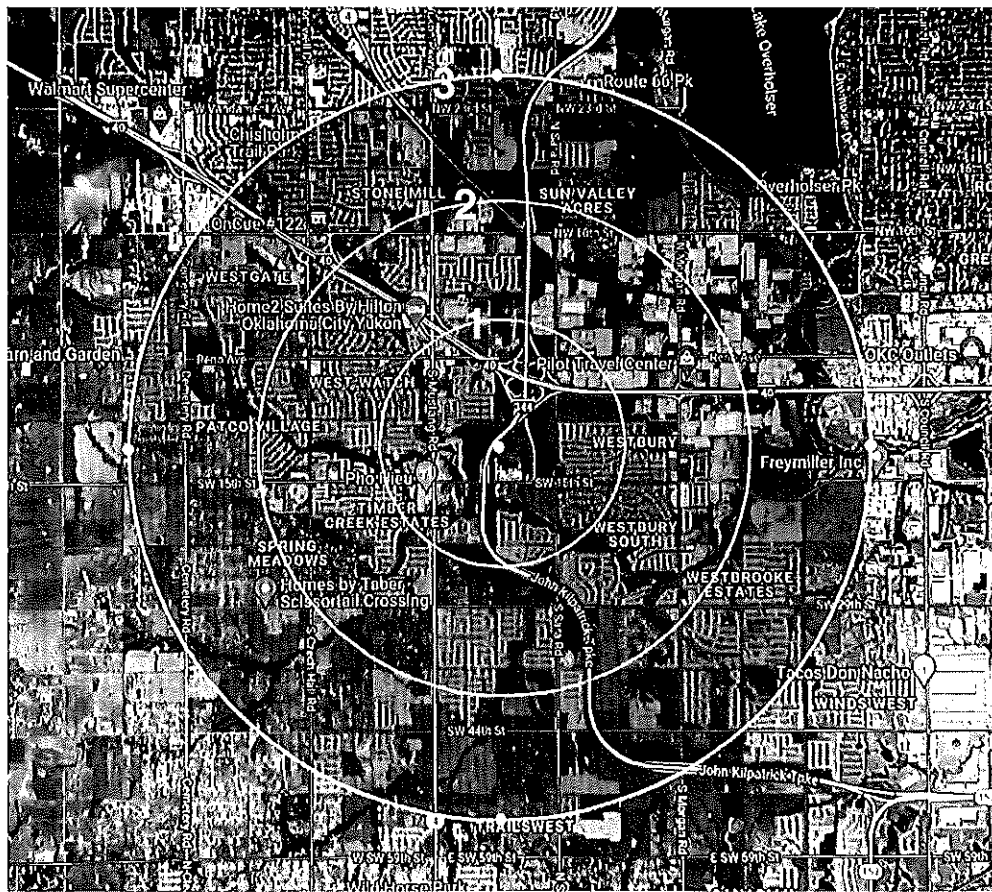


Figure 3. Radius circles for 1, 2, and 3 miles around proposed amphitheater site (satellite image, Google Maps).



Figure 4. One-mile radius (black) for which population estimate was available and one-mile radius (red) around the proposed amphitheater site.

Operational record of amphitheaters

It is always necessary to verify any ‘theoretical’ predictions by examining the operational record to see what has been learned thus far. A number of references were found to the occurrence of noise complaints at a variety of amphitheaters, including those already in Oklahoma City. Figure 5 illustrates, amongst others, examples of amphitheaters in operation that have used dB limits and A-scale measurements to attempt to limit the spread of noise into the nearby environs. One can see that the most common noise complaints are received at distances varying from over a mile to as far as 5 miles. In exceptional cases there have been reports of 10 and 15 miles distance. It is also evident that cases exist where noise complaints are received despite there being set limits for “acceptable” noise limits and the municipally measured noise being within the limits specified for that location. This further highlights how proposed monitoring techniques using the A scale appear ineffective at properly monitoring the emission and spread of noise that is underlying the complaints. Additional data for amphitheater noise complaints, including location, seating capacity, if monitored, and complaint description, are listed in Table A3 of the Appendix.

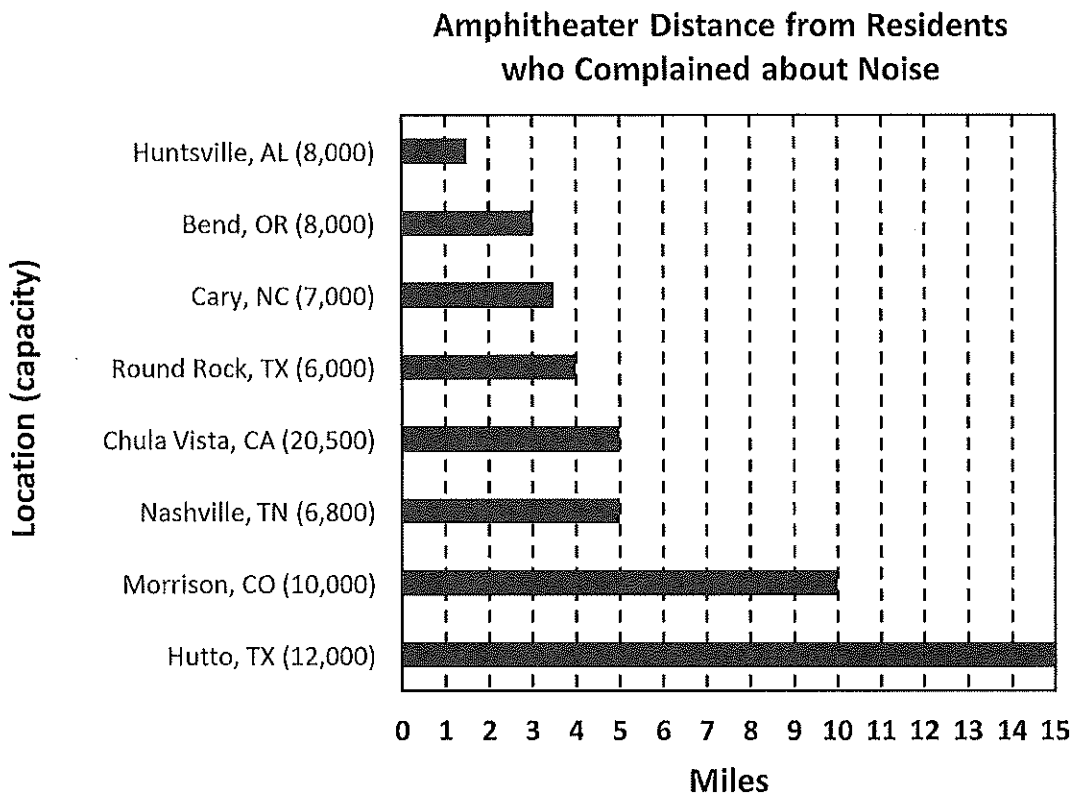


Figure 5. Amphitheaters locations near which noise complaints were received, seating capacity, and distance of complaint origin from facility.

Calibration Procedure for Noise Sensors

There did not appear to be any ISO 9000 procedural standards specified in the PUD for the installation, calibration, and maintenance of the noise sensors/monitors proposed for monitoring noise levels. Relief of 5dB (a not inconsequential INCREASE in perceived loudness) was granted in the PUD by the Planning Commission (required annual calibration was added by the Planning Commission on the recommendation of Mr. Meek. NOTE – This requirement was already present in the municipal regulations, calling for an ANSI standard and annual calibration: see 34-6, paragraph (b)). Referring to Chapter 34 in the municipal code, it requires that impulsive sound should have an allowable level 5 dB LOWER than the other types. Thus, it appears that not only was a 5 dB increase in allowed noise level granted for A-scale measurements but, by default, there appeared to be a 100% (10 dB) increase in the impulsive noise levels allowed if they are not excluded from the relief granted and they were not to be reduced per the code requirement.

Inappropriateness of A-scale weighting

The choice of the A-weighting sound measurement would preclude the detection of most of the low-frequency sounds which are the ones least expected to be attenuated and thus the most problematic, as well as the impulsive sounds. That is to say, the chosen scheme would appear only effective at detecting the frequency ranges that are most likely to be attenuated to some degree already. Given that the lower frequencies and impulsive sounds are the ones that will spread widely and induce vibration in structures, it appears inappropriate to use a scale that even further reduces the ability to measure those frequencies. Because their effects are more often felt than heard, claiming that the A scale attempts to adjust for how humans actually hear lower-frequency sounds is misleading at best and misrepresents the effects of these sounds. **In some cases, impact/impulse sound can actually be as much as 30 dB above the reading shown on the A scale** (Kantowitz & Sorkin, 1983).

How current measurements fail

Previously used dB limits at amphitheaters have been ineffective in reducing noise complaints (see Table 1), and the following contribute to the problem:

- 1) The human ear is less sensitive to bass and treble frequencies at “normal” listening levels. Those parts of the sound spectrum are usually boosted (using equalization tools) to create an equal-loudness experience for the listener.
- 2) As such, the lower frequencies are being broadcast at higher levels than the mid-range frequencies (depending upon the level of equalization used).
- 3) The A scale deemphasizes the lower range (Proctor & vanZandt, 1994) (and the higher range), so that the dB levels being measured, averaged across many frequency bands to get a single number, are more influenced by the mid-range sounds (Figure 5). It is the lower-frequency and impulsive (percussive, rapid onset, short duration) sounds that are generating the complaints (described variously as vibration, booming, thumping, etc.), but they are not being measured appropriately, and are not adequately measured on ‘standard’ sound meters set to the A scale. These sounds can travel for long distances and pass through window and walls with little attenuation (Waye, 2011).
- 4) The entire process is shown in Figure 6, starting with the original levels across frequencies and ending with the apparent result as observed using the A-scale measurement. The result can be low-frequency sounds being severely underrepresented despite them actually being at SPLs higher than the mid-range frequencies.
- 5) Thus, complaints are received, but the monitoring municipality reports that the noise levels are within the specified limits (Table 1) because the specific sound frequencies responsible for the

complaints are not being measured appropriately. It is for these reasons (low frequencies misrepresented and impulsive sounds not captured), that the A scale is no longer accepted as an appropriate way to measure all noise (*Alves et al., 2020; Pulsar, 2021*) and the C scale is preferred for those measurements (Audio Engineering Society Technical Council, 2020). Arguments that the A scale somehow represents behavior of the human ear ignores the fact that structures (houses, etc.) do not respond to noise as does the human ear regarding low frequencies (WHO, 1999). It is further recommended that broad-spectrum monitoring is used to represent fully the range and magnitude of frequencies present (WHO, 1999).

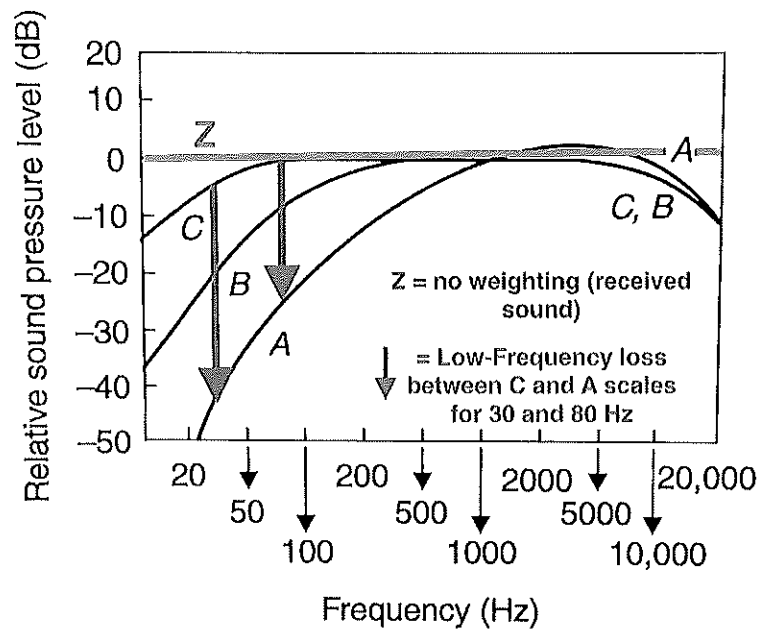


Figure 5. The A scale's reduction in sensitivity to lower frequencies. The green line represents the unbiased sound as received at the sensor (zero weighting). Adapted from Proctor and van Zandt (1994).

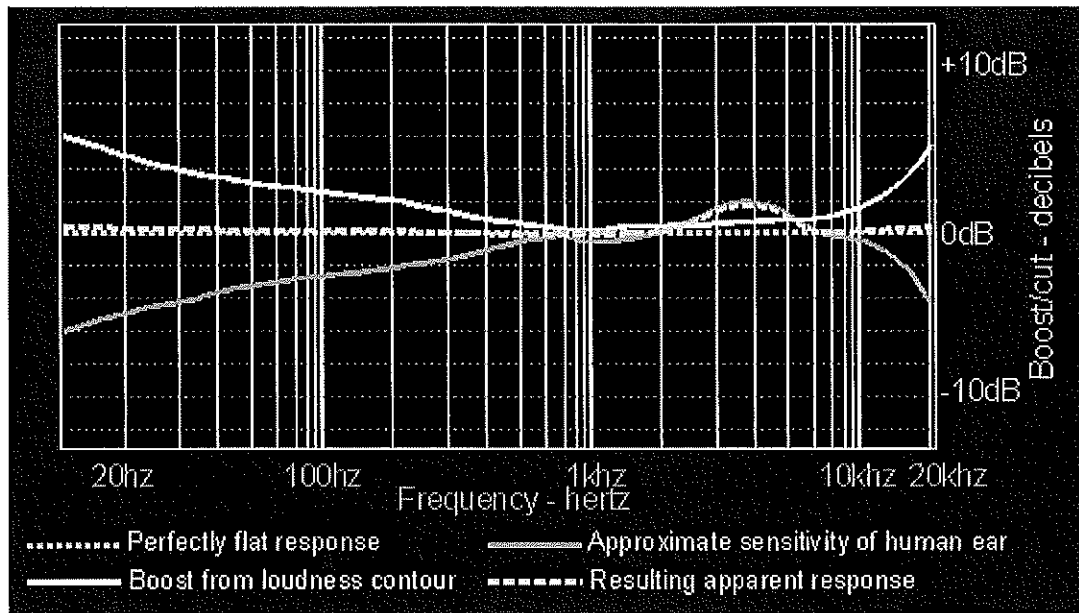


Figure 6. Steps in the transformation of a source sound from original levels (dotted cyan) to equal loudness contour (yellow), then A scaling profile (pink) which, when applied, produces the final apparent loudness profile (dashed line along zero dB axis). (Retrieved from https://www.bcael.com/loudness.htm#google_vignette)

As an example of how averaging, using the A scale, distorts the picture of sounds present, it is useful to look at a section of the applicant's predicted-data table (Table 1). This shows dB levels for each of nine octave bands, presenting levels for each of these parts of the audio spectrum. One can see that 32, 63, and 125 Hz bands, in the "without mitigation" row, are all over 75 dB. However, when the single averaged number across that row is calculated, it is only 69 dB(A). That is 13 dB lower than the actual sound present at 32 Hz, one of the problematic frequency areas. Thus, the overall single number would be under a limit of 70 dB(A), but the lowest three bands would be well above it, and 32 Hz more than twice the loudness (10 dB increase is a doubling) of what the "average" suggested. Because structures do not respond to sound as the human ear does, they will be affected by these lower frequencies disproportionately.

Table 1. Excerpt from applicant's predicted-sound-level data table.

| Across S Sara Rd ~2,300ft NE | Decibels (dB) at Octave Band Center Frequency (Hz) | | | | | | | | | Overall |
|--|--|-----|-----|-----|-----|----|----|----|----|----------|
| | 32 | 63 | 125 | 250 | 500 | 1k | 2k | 4k | 8k | |
| FOH Mix Position | 109 | 109 | 104 | 99 | 94 | 94 | 94 | 89 | 89 | 100dB(A) |
| Without Mitigation | 82 | 82 | 77 | 71 | 65 | 63 | 61 | 46 | 10 | 69dB(A) |
| With Physical and Electroacoustic Mitigation | 82 | 80 | 74 | 63 | 53 | 55 | 50 | 34 | 0 | 62dB(A) |

Applicant Requested Changes to Noise Code

Regarding the noise that can be generated on one property with one type of zoning and that can then enter adjoining properties with a different type of zoning, the municipal code [Chapter 34.6 (a)] states that "(3) sound projected from one use district into another use district of a lesser sound

level limit shall not exceed such lesser sound level measured at the boundary of such use district; (4) for any stationary source of sound which emits impulsive sound, the limits set forth in Table I shall be reduced by five dB(A).” The applicant has requested a modification of the noise code in their rezoning request that increases these levels above what is presently the requirement for the adjacent residential areas. The resulting levels are shown in Figure (7) by the noise reference type and the time of day it is applicable. Note that in several cases the resulting increase (10 dB) is a DOUBLING of the perceived loudness of the allowed sound. As such, the nearby residents are having the noise code standards that applied to their area changed without a change in the zoning of their property.

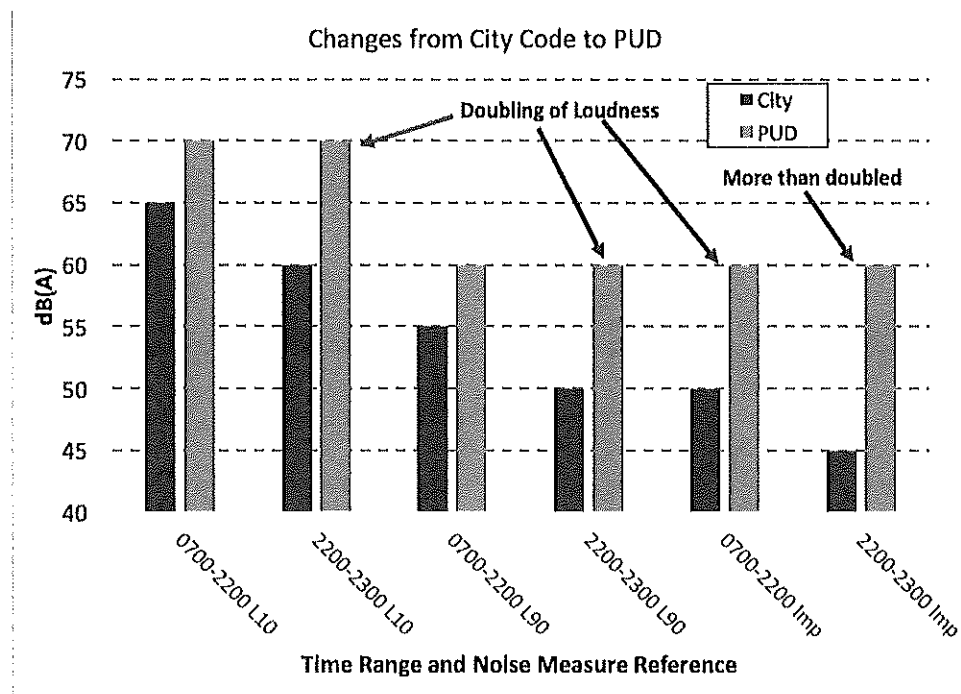


Figure (7). Noise code limits for single-residence areas (City) and requested levels to be approved in PUD.

Performance Type and Noise Complaints

Different types of performance will generate different levels of low-frequency and percussive (impulsive) sounds. Electronic Dance Music (EDM), rap, country, and some popular/rock performances have the highest incidence of generating this category of sound/noise. Orchestral, folk, choral, and brass band music (largely unamplified) generate comparatively lower levels of this noise. A number of the complaints noted for various venues involved either EDM or rock music as the source of noise.

Effects on humans

Unwanted sound (a.k.a. noise), can have both health effects and behavioral effects. Depending upon the type and level of noise, it can be associated with a number of health conditions, including

stress, hearing loss, hypertension, tinnitus, sleep disturbances, and others (Waye, 2011). It is also known to cause distraction and cognitive-deficit problems for various subpopulations (ADD, ADHD).

Effects on domestic animals

Dogs will likely not experience fear/anxiety responses unless the noises are sudden, prominent, and unpredictable. An example is loud, impulsive (e.g., fireworks) noises. As such, a fireworks show at this facility would most likely produce negative effects on domestic animals in the adjacent neighborhoods. Dogs will also respond to noises in the higher frequencies.

Sound levels and performer/attendee expectations

It has been found, in researching opinions regarding sound-limiting venues, that a number of touring groups/individuals will not perform at these venues because of the imposed limitations. It is yet to be determined how this would affect the venue's ability to attract a range of performance types.

In researching opinions of attendees relative to sound-limiting venues, some individuals have indicated that they do not favor attending at those venues because they believe the experience of the concert is thus limited. Some individuals indicated that they initially attended concerts at sound-limiting venues, but then discontinued their attendance because of the sound limiting (From web forum discussion on amphitheater venues and noise control).

Factors that may limit noise control effectiveness

- Fines are unlikely to be a deterrent. Interviews with professional sound mixers for some of these venues indicated that they regularly had levels high enough to generate complaints from the surrounding residents, but that the cost of fines for exceedance was factored into the cost structure (the cost of doing business).
- Type of sound equipment that is being used by the visiting performers (touring groups use their own, usually) is not being controlled by the venue, nor is the specific placement of the speaker systems. The only placement that appears defined is that of the mid-way system suspended from the overhead structures and about half of the way from the stage into the audience. As such, there would appear to be more control over the permanently installed system and less over the performer-provided ones.
- Venue self monitoring is not the norm for many of the monitored facilities. The most frequent arrangement is to have someone from the municipality's fire or police department monitoring the levels in real time and reporting to the whoever is responsible for the levels and mix when specified sound levels are exceeded, requesting a reduction in levels at that time.

Other Factors

Traffic

- Traffic counts reported by applicant as taken at Sara and SW 15th on 11/2/'23 are likely deflated relative to norms due to the extensive construction ongoing then and local residents choosing to use Morgan Road or Mustang Road. Traffic count is most likely to increase when widening of Sara is completed. The traffic study suggested a 2% increase could be expected from the counts they obtained, but this does not appear to consider the two large residential developments that are in progress south of SW 15th on Sara Road and the traffic that will be exiting the new development on the former Westbury Golf Course and ending up on Sara Road.
- Traffic flow using the underpass to SW 11th, which is presently a dirt path/road, appears unlikely to affect a significant reduction in traffic at other access points due to its stated use for special parking areas only (VIP, etc.).
- Traffic coming off of the tollway and exiting to the west on SW 15th now backs up all the way from Mustang Road to the tollway at peak traffic times. This is a distance of just under a half mile. This will continue until SW 15th is widened going west from the tollway and the left-turn lane (westbound on SW 15th at Mustang Road) arrangement is greatly modified to prevent backed-up traffic in that lane from obstructing other lanes. (This is repeated under Roads/Streets)
- Traffic noise (some complaints at other locations listed loud music being played in cars leaving after a concert as well as the noise of the vehicles themselves) and traffic headlights related to venue operation (entering and exiting vehicles) will affect residences along Sara Road, particularly if the primary entrances and exits, as depicted in the PUD, will be on Sara Road.
- Traffic exhaust pollution.

Parking

Estimation of 30% ride share traffic appears optimistically high. It is far more likely, given traffic seen at other venues, that this percentage is unlikely to exceed 20%. (Use of rideshare to downtown events is not comparable because people know that parking is limited in that area, especially for Thunder games. Another venue of some kind outside downtown would provide that best comparison and estimate of what level of rideshare use could be expected at the proposed facility).

Is additional parking in adjacent retail areas guaranteed? Otherwise there would be overflow to adjoining neighborhood, church (which would then need to install movable barriers/gates on two access roads to property), and school properties. This is already seen on the church

property (baseball fields) when there are school events and people choose to park across the street from the school.

As a corollary of (b), It is well established that people who do not wish to wait in long lines to enter parking or wait long periods of time to exit parking (applicant estimated 40 minutes at the least) will seek to park outside of the parking area associated with delays. This would implicate the neighborhood across Sara Road as the first likely alternate, then the school parking lots, followed by the church property (playing fields on east side). This will create further late-night noise, traffic, foot traffic, and congestion.

Will the parking area be secured when the venue is not in operation? If not, this could invite numerous unsanctioned activities.

Formation of heat island

Paving over a number of acres will produce a significant heat island where temperatures will be raised significantly over that of the surrounding areas (already a widely documented effect). What can be done to moderate this effect? Requirement for tree islands removed from PUD by Planning Commission. Applicant indicated meeting this requirement would require 7 additional acres of parking and some commission members suggested that previous installations implemented to meet this requirement were not successful long term in supporting trees. No specific examples were presented in support of this conclusion.

Light pollution

General light pollution may be expected from lights illuminating the parking area (likely high and of wide coverage) and in and around the amphitheater itself.

Potential glare as seen by drivers on tollway and Interstate 40. The primary effects are most likely to be on traffic southbound on tollway. A problem may also be posed by the large self-illuminated displays that are proposed for the facility depending upon the actual brightness levels, size of displays, and direction in which they face. This issue does not appear to have been addressed as it related to the tollway where it passes the proposed facility location.

Flood control, drainage, Mustang Creek

Issues regarding this topic are covered in the Staff Report. How is conformance with these requirements to be monitored on an ongoing basis? This was not done effectively regarding construction, in the last several years (still ongoing), on the former Westbury Golf Course property and residents had to report issues of material being pushed into the creek by construction activities.

There have been three significant flooding events along Mustang Creek in the last three years. This should be a major consideration in how areas in the vicinity of the watershed are developed and how runoff is to be handled (what additional infrastructure may be necessary).

Roads/streets

No bond-issue funding exists to allow the widening of Sara Road from SW 15th to the four-lane bridge that crosses I-40. This stretch of road would thus be two lanes when the proposed facility started operation.

Traffic coming off of the tollway and exiting to the west on SW 15th now backs up all the way from Mustang Road to the tollway at peak traffic time. This will continue until SW 15th is widened going west from the tollway and the left-turn lane (westbound on SW 15th at Mustang Road) arrangement is greatly modified to prevent backed-up traffic in that lane from obstructing other lanes.

Potential damage to new road surfaces, SW 15th and Sara Road, if they are in place prior to starting construction on the proposed facility. SW 15th road surface experienced significant damage from heavy-equipment traffic during the construction of the turnpike extension. Will this also be a concern for the new roadway surfaces regarding construction-equipment traffic during construction of the new facility? Does this require coordination with the Streets Department?

Hours/days of operation

An initial restriction of operation on three consecutive days was removed from the PUD. As such, there is no apparent limitation and events could be hosted for any consecutive number of days. There is also the question of what the limitations would be regarding when noise could be generated. The time frame for Thursdays was shorter than that for Fridays and Saturdays (see revised PUD).

In situations where there are multiple groups performing, it is frequently the case that the "headliner" begins later than scheduled. The general practice is to allow the headliner to complete their specified sets rather than cut them off (attendees want the full performance that they have paid for) and, thus, events can run late. This can extend the noise and traffic noise/congestion effects well beyond what has been indicated or agreed to in the PUD.

An estimate of number of events per year and the months of expected operation were presented in the proposal, but there was also mention of the availability of the facility for a range of other activities, some of which could be noise generators. As such it would be

expected that the number of days on which noise would be an issue could be far greater than the estimates provided.

Size of venue relative to other well-known venues

- a) At a capacity of 12,500, this facility is 2/3 the size of the Hollywood Bowl.
- b) It is roughly 2.5 times the size of the Greek Theater in Los Angeles.
- c) It is 1.3 times larger than the Red Rocks (Colorado) amphitheater. (note here known noise issues at Red Rocks)

Security and law enforcement

The applicant indicated that there would be security personnel on site for traffic control, etc.

On-site security would likely have authority over traffic and attendee behavior on the property, but would have no authority anywhere in the surrounding space.

The influx of attendees could be at a maximum of 12,500 individuals.

The applicant intends to serve alcohol on the premises. If 100% of the attendees do not park in the parking lot(s) provided, this could involve people who have consumed alcohol exiting on foot into the adjacent neighborhood to go to their cars. This could then result in additional circumstances requiring the intervention of law enforcement. There is no police substation in close proximity to the area. The Patrol Division that covers this area in the Southwest Division, formerly Will Rogers, whose briefing station is located at 5501 S. Portland Avenue.

Values of surrounding properties

Mr. Meek ventured an unsupported opinion that property values would increase after this facility was completed and in operation. No documented data were referenced.

Opinions were solicited from several individuals who are licensed realtors and property managers. They were of the opinion that (1) the proposed facility was located too close to the residential areas and (2) that residential property values would be decreased relative to what they would normally be after inflation was taken into account. (That is to say, all property dollar values were expected to continue to increase as a function of inflation, but those near the proposed facility would not increase proportionately. As such in the absolute sense, literal dollar values might increase, but would be suppressed below the increases in other areas, thus resulting in an inflation-adjusted loss.)

Compatible Land Use

By statute, the city is required to follow planOKC, the city's comprehensive plan. A PDF version of this document is available at https://planokc.org/wp-content/uploads/2020/04/01_planokc_final_20201210.pdf. Specific reference is to section 2, Land Use Plan. Referring to page 46 of that document, Gross Land Use Compatibility and associated Compatibility Triggers and Mitigation Measures; (O) Operational, (B) Building Scale and Site Design, and (T) Traffic. Noise considerations are in the Operational Impact section as follow.

Table 2. Land Use Compatibility, Operational Impact (retrieved from https://planokc.org/wp-content/uploads/2020/04/01_planokc_final_20201210.pdf).

| (O) OPERATIONAL IMPACT | |
|--|--|
| These potential conflicts are caused by operational characteristics such as noise, light, hours of operation, emissions, and odors. Typically operational impact concerns arise when a project is proposed next to a less intense use. However, in some cases the proposed project may need to take measures to reduce the impact of an existing use, such as a residential use proposed next to an existing industrial use. | |
| TRIGGERS | MITIGATION MEASURES |
| Projects that meet the criteria below must use mitigation measures to address compatibility concerns. | List of potential measures to mitigate issues of compatibility. The list is not exhaustive – developers are encouraged to propose their own solutions. |
| <ol style="list-style-type: none"> 1. Noise levels above those found in typical residential settings; 2. Any detectable odors; 3. Spill light above that found in typical residential settings; or, 4. Hours of operation before 6 am or after 10 pm of businesses within proximity to residential uses. | <ul style="list-style-type: none"> • Contain operating effects (including noise and odors) within building walls to the maximum degree possible and at least within site boundaries • Use vertical screening to block visual effects of high impact components such as mechanical equipment and service areas. • Direct light generated by higher intensity uses, including direct illumination of parking and service areas, signs, and structures, away from adjacent residential areas and public streets. • Screen drive-through services and integrate screening into the overall design of buildings and landscaping. Contain the visual impact of these service functions from adjacent public streets and neighboring residential properties. • Reduce noise through additional wall insulation, plantings, fences and walls, and strategic placement of doors and windows. |

The City's Staff Report on the proposed PUD specifically referenced this "trigger" as follows on page 10 of their report: *"The proposal triggers potential operational impacts near the elementary school and middle school to the south. Operational impacts are also identified with the proposed use of an outdoor concert venue/amphitheater near schools and neighborhoods, specifically related to noise and traffic."* If one then examines the steps for determining if the proposal trips a compatibility trigger, and the staff report appeared to suggest that this proposal did, one can see that this is supported in the wording of that section (Table 3).

Table 3. Criteria for determining if a compatibility trigger was tripped (sourced as was Table 2).

| Step 3: Determine whether proposed use trips a compatibility "trigger" (pages 76-79) | |
|---|--|
| Compatible | Proposed use is the same or complementary to surrounding uses in scale, traffic impact and/or operational impact. |
| Somewhat Compatible Minor Modification Required | Proposed use has potential conflicts with adjacent uses that can be remedied or minimized through project design, such as traffic mitigation and/or building design and scale. |
| Potentially Compatible Significant Mitigation Required | Proposed use may have significant conflicts with adjacent uses, and may require significant mitigation to reduce impacts, and may not achieve full compatibility. |
| Incompatible | Proposed use deviates significantly in density, intensity, scale, form, or activity causing negative impacts on, or being negatively impacted by, surrounding land uses. Project should not be supported unless extraordinary measures can be taken to offset the impacts. |

If one takes into account all of the noted issues in the context of the land-use consideration, and most specifically the noise issue, the outcome would then appear to indicate that the proposed use of the site falls into the “incompatible” category.

Summary

The evaluation of the proposed use outlined in PUD 1983 was based upon careful examination of the proposal, the two attached reports (sound, traffic), and the City Staff Report. A number of reference documents that bore directly on the issue of noise were examined to determine how statements in the PUD and suggestions for noise control that were made in the Planning Commission meeting compared with known facts in the literature. Additional data were obtained to determine what was known of the operational records of this category of facility regarding nuisance noise and public complaints. This careful examination of the various topics at a detailed level, and taking into account both operational experience and attempted/recommended remedies, resulted in the conclusion that immediate and effective solutions for all of the relevant issues raised in the review were not available, and that siting the proposed facility at the location specified in the PUD would create negative effects for nearby residents in the adjacent and further distant established subdivisions, as well as in some that are currently in development. As such, it is not possible, in the light of this evaluation, to recommend that rezoning for this project be approved.

References

(Note: Reference material that was available by internet access was prioritized so that the sources could be directly viewed, through the link, and evaluated by the reader.)

Alves, J.A., Paiva, F.N., Silva, L.T. and Remoaldo, P. (2020). Low-Frequency Noise and Its Main Effects on Human Health—A Review of the Literature between 2016 and 2019. Published online by MDPI, retrieved from: <https://www.mdpi.com/2076-3417/10/15/5205>.

Audio Engineering Society Technical Council (2020). Understanding and managing sound exposure and noise pollution at outdoor events. Technical Document AESTD1007.1.20-05.

Huchingson, R. D. (1981). *New Horizons for Human Factors in Design*. New York: McGraw-Hill Book Company.

Kantowitz, B.H. and Sorkin, R.D. (1983). Chapter 16 (Noise). *Human Factors: Understanding People-system Relationships*. New York: John Wiley & Sons.

Proctor, R.W. and van Zandt, T. (1994) *Human Factors in Simple and Complex Systems*. Chapter 18: The Physical Environment. Boston: Allyn and Bacon.

Pulsar Instruments (2021). Understanding A-C-Z noise frequency weightings. Accessed from: <https://pulsarinstruments.com/news/understanding-a-c-z-noise-frequency-weightings/#:~:text='A'%20Weighted%20is%20the%20most,ear%20is%20not%20very%20sensitive>.

Sanders, M.S. and McCormick, E.J. (1987), *Human Factors in Engineering and Design* (6th Edition; Chapter 16: Noise). New York: McGraw-Hill Book Company.

Savleudy, G. (Ed.), (1987). Handbook of Human Factors. New York: John Wiley & Sons.

The National Safety Council (1974). Accident Prevention Manual for Industrial Operations, Seventh Edition (Frank McElroy, Ed.). Chicago IL: The National Safety Council.

World Health Organization (1999). B. Berglund, T. Lindvall, and D.H. Schwela (Eds.). Guidelines for Community Noise. Geneva: World Health Organization.

World Health Organization (2022). Environmental noise. In: Compendium of WHO and other UN guidance on health and environment, 2022 update. Geneva: World Health Organization; 2022 (WHO/HEP/ECH/EHD/22.01). Licence: CC BY-NC-SA 3.0 IGO.

Waye, K.P. (2011). Noise and Health – Effects of low frequency noise and vibrations: Environmental and occupational perspectives. In: Encyclopedia of Environmental Health. Chapter retrieved from: https://www.google.com/search?q=Kerstin+persson+Waye+chapter+in+encyclopedia+of+Environmental+Health&sca_esv=ab430696bdb40234&sca_upv=1&ei=2GUMZo3JBuPdwn4Pg-qaMA&ved=0ahUKEwiNIZPoqqSFAxXjLtAFHQO1BgYQ4dUDCBA&uact=5&oq=Kerstin+persson+Waye+chapter+in+encyclopedia+of+Environmental+Health&gs_lp=Egxnd3Mtd2l6LXNlcnAiREtlenN0aW4gcGVyc3NvbXBXYXIIIGNoYXB0ZXIgaW4gZW5jeWNsb3BIZGlhIG9mIEVudmlyb25tZW50YWwgSGVhbHRoSMemAVD8ClIRnAFwA3gAkAEAmAHfAaAB5SSqAQcxMi4zMS4xuAEDyAEA-AEBmAiroAL1JMICBRAhGKABwgIEECEYFZgDAIgGAZIHBJQuMzguMaAHrcsB&scient=gws-wiz-serp

Links

Oklahoma City 2017 review of noise ordinances

<https://journalrecord.com/2017/05/okc-reviewing-concert-noise-ordinance/>

Noise problems at Red Rocks Amphitheater

<https://www.avixa.org/pro-av-trends/articles/noise-problems-at-red-rocks-addressed-by-data-analysis>

Sound restrictions controversy at Red Rocks (2015)

<https://duselj.wordpress.com/2015/02/20/sound-restrictions-imposed-on-red-rocks-amphitheater-spark-controversy/>

Noise complaints and problems at Nevada Amphitheater

<https://kesq.com/cnn-regional/2022/05/11/homeowners-desperate-for-solutions-to-late-night-amphitheater-noise/>

Noise complaints summary for a selection of amphitheaters

<https://www.gainesville.com/story/opinion/columns/more-voices/2017/10/22/karen-orr-amphitheater-would-cause-neighborhood-noise-pollution/18182822007/>

Downtown condo owners worried about noise from Grand Rapids amphitheater

<https://www.mlive.com/news/grand-rapids/2023/12/downtown-condo-owners-worried-about-noise-from-grand-rapids-amphitheater.html>

Low-frequency noise from amphitheater near Raleigh, NC

<https://www.wral.com/video/koka-booth-responds-to-noise-complaints-from-weekend-concert/19910021/>

Amphitheater noise control

<https://markweinguitarlessons.com/forums/threads/amphitheater-noise-control.87257/>

Journal of the Acoustical Society of America; Noise abatement study of amphitheater

https://pubs.aip.org/asa/jasa/article/151/4_Supplement/A26/2839083/Noise-abatement-study-for-an-amplified-music

Maximizing acoustic performance in sustainable amphitheater and outdoor venues

<https://utilitiesone.com/maximizing-acoustic-performance-in-sustainable-amphitheaters-and-outdoor-venues>

Acoustical impact of a large outdoor amphitheater on surrounding residences

<https://pubs.aip.org/asa/jasa/article/70/S1/S4/678369/Acoustical-impact-of-a-large-outdoor-amphitheater>

Equal loudness contours – purely misleading

<https://www.meterplugs.com/blog/2016/12/11/equal-loudness-curves-purely-misleading.html>

Acoustics in Music: Outdoor, Indoor, and Isolated Spaces

<https://online.berklee.edu/takenote/acoustics-in-music/>

Comparison of weighting scales and preference for C to measure impulse sounds

Understanding A-C-Z noise frequency weightings

Accessed from: <https://pulsarinstruments.com/news/understanding-a-c-z-noise-frequency-weightings/#:~:text='A'%20Weighted%20is%20the%20most,ear%20is%20not%20very%20sensitive.>

[weightings/#:~:text='A'%20Weighted%20is%20the%20most,ear%20is%20not%20very%20sensitive.](https://pulsarinstruments.com/news/understanding-a-c-z-noise-frequency-weightings/#:~:text='A'%20Weighted%20is%20the%20most,ear%20is%20not%20very%20sensitive.)

Appendix

Table A1. Estimated attenuation of sounds from the amphitheater facility as indicated by the results of the sound study provided by the applicant. From Noise Report submitted to applicant by LSTN Consultants. Highlighted (yellow) entries show frequencies (32, 63, and 125 Hz) where there is essentially no difference between the ‘unmitigated’ sound level at the estimated point and the sound level ‘with mitigation.’

Aggregate Effect

The Physical and Electroacoustic mitigation measures described above are expected to reduce environmental noise emissions from the amphitheater, particularly toward the south, east and west. In the table below, we summarize initial analysis of the benefits of the physical and electroacoustic mitigation measures.

| Corner lot at S W 8 th and Garrison Ln ~1,500ft NW | Decibels (dB) at Octave Band Center Frequency (Hz) | | | | | | | | | Overall |
|--|--|-----|-----|-----|-----|----|----|----|----|----------|
| | 32 | 63 | 125 | 250 | 500 | 1k | 2k | 4k | 8k | |
| FOH Mix Position | 109 | 109 | 104 | 99 | 94 | 94 | 94 | 89 | 89 | 100dB(A) |
| Without Mitigation | 85 | 85 | 80 | 75 | 69 | 68 | 67 | 56 | 33 | 74dB(A) |
| With Physical and Electroacoustic Mitigation | 85 | 85 | 79 | 71 | 63 | 65 | 62 | 49 | 28 | 70dB(A) |

| Across S Sara Rd ~2,300ft NE | Decibels (dB) at Octave Band Center Frequency (Hz) | | | | | | | | | Overall |
|--|--|-----|-----|-----|-----|----|----|----|----|----------|
| | 32 | 63 | 125 | 250 | 500 | 1k | 2k | 4k | 8k | |
| FOH Mix Position | 109 | 109 | 104 | 99 | 94 | 94 | 94 | 89 | 89 | 100dB(A) |
| Without Mitigation | 82 | 82 | 77 | 71 | 65 | 63 | 61 | 46 | 10 | 69dB(A) |
| With Physical and Electroacoustic Mitigation | 82 | 80 | 74 | 63 | 53 | 55 | 50 | 34 | 0 | 62dB(A) |

“These results are typical for outdoor amphitheaters—High frequency sounds are well attenuated by loudspeaker orientation and directivity, barriers, and air absorption at reasonable distances from the amphitheater. Low frequency sounds are the hardest to reduce at distance.” *(This end note provided with table in original document.)*

Table A2. Historical population figures for a one-mile radius around the intersection of SW 15th Street and Mustang Road (from promotional literature for Mustang Creek Crossing).

| SW 15th St & S Mustang Rd Oklahoma City OK 73099 | 1.00 mile radius | 5.00 mile radius |
|---|-----------------------------|-----------------------------|
| Square Miles Land Mass | 3.14 | 78.49 |
| Population & Growth | | |
| 2018 Total Population | 5,896 | 97,968 |
| 2018 Population Density | 1,878 psm | 1,248 psm |
| 2010-2018 Growth | 1,393 30.9% | 20,843 27.0% |
| 2010-2018 Avg. Annual Growth | 199 3.9% | 2,978 3.4% |
| 2023 Total Population | 6,619 | 109,383 |
| 2023 Population Density | 2,108 psm | 1,394 psm |
| 2018-2023 Proj. Pop. Growth | 723 12.3% | 11,415 11.7% |
| 2018-2023 Avg. Annual Growth | 103 1.5% | 1,631 1.5% |
| 2010 Total Population | 4,503 | 77,125 |
| Households & Growth | | |
| 2018 Households | 2,184 | 36,705 |
| 2010-2018 Growth | 511 30.6% | 7,706 26.6% |
| 2010-2018 Avg. Annual Growth | 73 3.8% | 1,101 3.3% |
| 2023 Households | 2,452 | 40,980 |
| 2018-2023 Growth | 268 12.3% | 4,275 11.6% |
| 2018-2023 Avg. Annual Growth | 38 1.5% | 611 1.5% |
| 2010 Households | 1,673 | 28,999 |
| Families | | |
| 2018 Families | 1,621 | 27,308 |
| 2023 Families | 1,819 | 30,477 |

Table A3. Locations and names of sample amphitheaters, seating capacities, distances from which complaints received, within or not within limits specified, and description of noise.

| Location | Name | Seating capacity | Complaints at: | City claims w/in limits? | Noise description/comments |
|---------------------|-------------------------------|------------------|----------------|---------------------------|---|
| Chula Vista, CA | Mattress Firm Amphitheater | 19,468 | 5 miles | Yes | Booming, thumping |
| Des Moines, IA | Lauridsen Amphitheater | 2k to 25k | 2 miles | considering new ordinance | Vibration, bass |
| North Las Vegas, NV | Craig Ranch Park Amphitheater | 6800 | unspecified | Yes | Thumping, rattling |
| Oklahoma City, OK | Lost Lakes Amphitheater | 7,000 | unspecified | 2017 reviewed ordinance | unspecified |
| Huntsville, AL | Orion Amphitheater | 8,000 | 1 mile | Yes | Heard Lyrics |
| Raleigh/Cary, NC | Koka Booth Amphitheater | 7,000 | 3 miles | unspecified | rattling, thumping |
| Nashville, TN | Ascend Amphitheater | 6,800 | 3 miles | Yes | heard in East Nash and Donelson |
| Austin, TX | The Concourse Project | 2,000 | 2 miles | unspecified | walls thumping, picture frames rattling |

RECEIVED

By The City of Oklahoma City Office of the City Clerk at 11:46 am, Apr 02, 2024

From: lora koeninger <westburyinfo@yahoo.com>

Sent: Tuesday, April 2, 2024 10:29 AM

To: City Clerk Email <CityClerk@okc.gov>

Subject: City Clerk OKC: PUD 1983 April 9th City Council Meeting re: REZONING

You don't often get email from westburyinfo@yahoo.com. [Learn why this is important](#)

City Clerk and City Council OKC:

WSNA has always petitioned for INFRASTRUCTURE before Development in the SW Sector of Oklahoma City, OK so as NOT to jeopardize existing (tax paying) Homeowners Property Rights.

Sara Road North of SW 15th is a NARROW Two (2) lane road which is currently over crowded with traffic at almost any hour of the day and backed up between 5- 6:30 in the evenings with coming home traffic. Three (3) INGRESS/EGRESS are in the development plan for the Amphitheater project off this NARROW 2 LANE ROAD. This is a reoccurring situation in the SW Sector of Oklahoma City because INFRASTRUCTURE has not been put in place before DEVELOPMENT has been approved.

SW 15th is in the plan for widening in 2025 but, with the widening of Sara Road between SW 15th and Mustang - this took YEARS to Complete. Putting the Development in on this APPLICATION BEFORE widening of Sara Road North of SW 15th would be catastrophic mess both for the Current Homeowners and the traffic coming into the development in the next years.

Do what is RIGHT not what is EASY. Please consider INFRASTRUCTURE before approving any FURTHER DEVELOPMENT.

Respectfully.

WSNA
P.O Box 852115
Yukon OK 73085

RECEIVED

By The City of Oklahoma City Office of the City Clerk at 11:46 am, Apr 02, 2024

From: Anita Watson <anitawatson59@yahoo.com>
Sent: Tuesday, April 2, 2024 11:04 AM
To: City Clerk Email <CityClerk@okc.gov>
Subject: Fwd: Protest PUD-1983 - Sunset Amphitheater

You don't often get email from anitawatson59@yahoo.com. [Learn why this is important](#)

Anita Watson

Begin forwarded message:

I, Anita Watson, owner of 1213 Edinburg Drive, Yukon, Ok. 73099, hereby protest the proposed PUD-1983 by Mustang Creek Crossing LLC to rezone 810 South John Kilpatrick Turnpike, Oklahoma City.

I do not believe the proposed site is suitable for a venue such as this because this property is located in the middle of a residential area with thousands of homes that will be impacted by the noise and vibration that simply cannot/won't be controlled because of they type of venue that it is.

Before casting your vote, please consider whether you would want this to be in your backyard. None of the thousands who purchased homes in this area signed up for a nuisance such as this to be approved in their neighborhood.

Respectfully,

Anita Watson

RECEIVED

By The City of Oklahoma City Office of the City Clerk at 11:46 am, Apr 02, 2024

From: Anita Watson <anitawatson59@yahoo.com>

Sent: Tuesday, April 2, 2024 11:06 AM

To: City Clerk Email <CityClerk@okc.gov>

Subject: Fwd: Protest PUD-1983 - Sunset Amphitheater

You don't often get email from anitawatson59@yahoo.com. [Learn why this is important](#)

To Whom it May Concern,

I, Lloyd Watson, owner of 1213 Edinburg Drive, Yukon, Ok. 73099, hereby protest the proposed PUD-1983 by Mustang Creek Crossing LLC to rezone 810 South John Kilpatrick Turnpike, Oklahoma City.

I see many issues with this proposal. The main one is the amount of noise that our homes will be subjected to 2-4 days per week from “spring to October” of each year. This property is located in the middle of a residential area with thousands of homes in the surrounding area.

I also see that the plan calls for three entrance/exits on to South Sara Road which is a two-lane road with no interstate access. I have seen no plans to widen Sara Road north to Reno Avenue.

Save our quiet neighborhoods and vote NO to rezoning for PUD-1983.

Respectfully,

Lloyd Watson

RECEIVED

By The City of Oklahoma City Office of the City Clerk at 11:46 am, Apr 02, 2024

From: Dan Brownlow <dlbrownlow4@gmail.com>

Sent: Tuesday, April 2, 2024 11:26 AM

Subject: Protest PUD-1983, Sunset Amp

You don't often get email from dlbrownlow4@gmail.com. [Learn why this is important](#)

Hello,

I hereby protest PUD-1983 application by Mustang Creek Crossing, LLC to rezone 810 South John Kilpatrick Turnpike.

Our family of 4 just moved from Tulsa and bought a house on April 1, 2024 in the Woodrun addition near Mustang Road and Reno intersection. Our new house is less than 1.5 miles from the proposed amphitheater. We did not learn about this until after we were under contract. If I would have known about it I would have found a way out of the contract and not purchased this home due to its proximity to the proposed amphitheater. My children will be attending Mustang Creek elementary, which is in the same block as the proposed amphitheater.

My biggest concern is the noise level. I have been to many concerts in my life and these concerts go well beyond any curfew and noise limit. Part of the purposed is a less restrictive noise level. dBA's scale is logarithmic, every 10 dB increase is 100% louder; there is a large difference between 60 dB (Normal conversation level) and 70 dB (heavy traffic). According to [soundcore.com](https://us.soundcore.com/blogs/speaker/what-is-a-good-db-for-speakersv), a manufacturer and retailer of speakers and headphones, the recommended decibels for an outdoor concert is 110-120 decibels. Compared to an indoor venue they recommend 75-80 decibels. <https://us.soundcore.com/blogs/speaker/what-is-a-good-db-for-speakersv>

I am a homeowner at 11733 Silver Maple Dr, Yukon and I oppose and ask you to deny the rezoning of this PUD.

Dan Brownlow

11733 Silver Maple Dr

Yukon OK 73099

RECEIVED

By The City of Oklahoma City Office of the City Clerk at 11:46 am, Apr 02, 2024

From: Megan Yarber <mnyarber@gmail.com>

Sent: Tuesday, April 2, 2024 11:05 AM

To: City Clerk Email <CityClerk@okc.gov>

Subject: Protest PUD-1983

You don't often get email from mnyarber@gmail.com. [Learn why this is important](#)

To whom it may concern:

I, Megan Yarber, herby protest PUD-1983 by Mustang Creek Crossing, LLC to rezone 810 S John Kilpatrick Turnpike.

As a resident of Westbury North for the last 7 years and lifelong resident of the Mustang/Yukon area I have numerous concerns about how this project will affect our community.

The main concerns I have are listed below however, I imagine there are additional issues that could arise if the venue is built.

1. **Noise Pollution:** This venue will sit directly beside numerous homes, daycares, and multiple public schools. Based on the information I have seen posted by the proposed developers, there is no way for them to manage the sound waves in a way that it would not affect local residents in their homes or children at school. I have attached a PDF to this email that contains studies conducted on the effects of noise frequencies and the direct impact on human health. Based on these studies, humans experience increase levels of sleep disorders, anxiety, mental fatigue and decreased mental performance. Our children are already under additional daily stresses, how can we knowingly put in a venue that could directly affect their home life and subsequently their ability to perform during the school day? I'd like you to imagine a car driving through your neighborhood with their base speakers on full blast and all of their windows down. We've all heard these sounds at one point or another and recognize that they are an annoyance. Now imagine that the car doesn't continue to drive past, the music continues to play for hours on end through the entirety of a concert, multiple nights a week, year-round. I did not see any noise mitigation or physical noise abatement structures listed in the proposal from Live Notes, how are they planning to manage the way these sound waves carry through the air and the ground? Regardless of the additional reasons I will list below, this noise pollution issue should be the number one reason why this project does not get approved for rezoning.
2. **Increased Traffic:** I believe that the addition of the Sunset Amphitheater would make the current traffic situation in our area much worse. If you have not driven down SW. 15th St. from 7AM - 8:30 AM, 2:15 PM - 4PM or 5PM - 6:30 PM I would encourage you to take that drive. Between people trying to drop their children off at two different public schools and additional people trying to get to work or back

home from work, driving down SW. 15th St. is almost impossible to navigate for a large portion of the day. What should take 2 to 3 minutes ends up taking 20 to 30 minutes. Even with the proposed road widening and proposed turnpike tunnel there is no way to see how this area will be able to handle the additional traffic from a concert venue. We can barely handle having 2 schools let kids out in the afternoons, now we think these roads will be able to manage thousands upon thousands of extra vehicles with no access to I-40 on Sara Road? The truth is that people will inevitably use my neighborhood to cut through to avoid traffic which will only add to more traffic issues at other exits onto SW 15th or Sara Rd. That doesn't include the individuals who will want to park their cars in Westbury streets and walk to the concert to avoid parking fees. There are currently 3,500 parking spots planned for 12,500 people. Knowing that individuals will need to drive to the venue, how will 1/4 of spots accommodate all of the vehicles needed. What about the addition of rideshare vehicles parked and waiting for passenger pick ups? The traffic issues will be endless and unavoidable, just like when an event is released from Paycom Arena. Are we to expect that main roads will be blocked off by police and concert traffic will take precedence over those who need to access our neighborhood to get to our homes? This is a public safety concern that should also be top of mind.

3. **Increase in Crime & Potential Emergencies:** When bringing 12,500 additional people to a suburban area you can anticipate that there will be emergencies of some nature. When we have an unstable traffic situation and already delayed response times from OKCPD. There is no OKCPD or Canadian County Sheriff's station close to this area. What if a resident has an emergency and first responders are unable to reach us due to traffic blocks? Minutes, even seconds, count when an emergency situation arises. How will we be reached in a timely manner? These emergencies wouldn't just include medical or those of residents but concert goers as well. With any concert venue there is alcohol present and the use of drugs - numerous situations could happen - medical emergencies, physical assaults, robbery, etc. How can we ensure the public's safety and not expect an increase of DUIs and those driving impaired from drugs? What about the fact that these potential situations will be a mere hundred feet from 2 schools and close to 3,000+ homes that have families. Lastly, we have already seen a significant increase in crimes in the Westbury North & South neighborhoods. Personally, our vehicles have been broken into on 4 separate occasions. Like with anything, the more people it attracts the more crime that will come with it. We can't handle more break-ins and random people wandering the neighborhood streets while our families sleep. The "ifs" are too important to wonder and hope they don't happen.

In closing, I hope you and the rest of the Council will see there is much more to be lost here than can ever be gained by an "economic impact". Dropping a concert venue for 12,500 people in the middle of almost 4,000 residents and a town that is already growing too fast is a recipe for disaster. Please think about the long term effects on our residents, our

children, and our community. I reside at 10016 Fairfax Terrace Yukon, OK and I ask you to please **vote against rezoning for PUD-1983**.

Articles of similar amphitheaters and the issues they have caused local residents:

[Round Rock Amphitheater, Round Rock, Texas](#)



[Hayden Homes Amphitheater, Bend, Oregon:](#)

Thank you,
Megan Yarber

10016 Fairfax Terrace
Yukon, OK 73099

Review

Low-Frequency Noise and Its Main Effects on Human Health—A Review of the Literature between 2016 and 2019

Juliana Araújo Alves ^{1,*}, Filipa Neto Paiva ², Lígia Torres Silva ² and Paula Remoaldo ¹

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Abstract: This paper summarizes the presently available knowledge about the association between low-frequency noise and its effects on health. A database was constructed with a total of 142 articles published between 2016 and 2019 regarding low-frequency noise exposure and its effects on health. A total of 39 articles were analysed in depth. The articles were divided into categories according to the effects on human health addressed. Regarding the emitting source, there was a greater number of articles addressing issues related to sources of environmental noise and noise from wind turbines. As for the effects generated on human health, there was a greater number of articles referring to the effects on sleep disorders, discomfort, sensitivity to and irritability from noise, annoyance, hearing loss, and cardiovascular diseases, and these effects are analysed in more detail in the present article.

Keywords: low-frequency noise; human health; impacts; environment; literature review

1. Introduction

At the worldwide level, there is a large number of studies on health impacts due to occupational and environmental exposure to noise. However, there are still few studies focusing exclusively on health impacts and discomfort due to low-frequency noise (Figure 1). One of the main reasons for this is the low sensitivity of the human auditory system to low frequencies. On the other hand, this type of noise has very particular characteristics and causes much more discomfort and long-term, non-auditory effects [1–3].

In the 1920s, research on the subject focused on occupational exposure and generally reported physiological changes such as pain in the hands, swelling, and increased vascular tone [4–6]. Until the 1930s, it was believed that the effects of noise on health were restricted only to hearing loss. In a study published in the *Journal of the Acoustical Society of America*, Jüichi Obata et al. [7] concluded that the effects of noise on human health went beyond hearing loss.

After the low contribution to the improvement of this scientific field in the 1960s, the 1970s were marked by the emergence of a series of studies addressing annoyance caused by environmental noise [1].

Consequently, during the 1970s and 1980s, studies started focusing on the impacts due to exposure to environmental noise [8,9]. The 1990s were marked by research aimed at more specific impacts on human health and reported discomfort due to noise [9–11]. Furthermore, these studies correlated exposure to noise with the onset of cardiovascular diseases [12,13].

In the 1990s, the World Health Organization (WHO) published documents on the subject, such as the *Guidelines for Community Noise*, in 1999. Regarding the studies published during the 2000s,

the most important are those directed at specific environments, such as schools and residential areas [14,15]. These studies used a comparison of the noise level measured by using reference curves with the aim of assessing noise discomfort and reinforced the fact that the A-weighting filter is not ideal to evaluate the non-auditory effects of low-frequency noise (LFN) [1–3]. From 2005, the studies that stand out are oriented to the impacts of low-frequency noise on the quality of sleep [16–18].

In general, these studies were carried out with voluminous samples involving patient reports, the application of questionnaires, the adoption of cross-sectional studies based on databases, and the comparison of environmental noise levels measured using criteria curves.

In fact, these studies reinforced the fact that low-frequency noise is a powerful stressor. The most cited effects on human health refer to emotional changes such as annoyance [19,20], agitation, and distraction [2,21,22], in addition to the association of low-frequency noise with cognitive alterations [23], the development of cardiovascular diseases [24,25], sleep disorders [26], and high blood pressure [27], and, more recently, the effects of industrial low-frequency noise on dental wear [28,29].

In the field of occupational medicine, there is a large number of studies that claim that low-frequency noise is an agent that interferes with the performance of work tasks [22,30]. In addition to these changes, noise can be an agent that affects mental and physical health.

In this sense, the effects of noise pollution comprise “auditory effects”, which directly affect the human auditory system, and “non-auditory effects”, i.e., the impact of noise on physiological functions. As regards “non-hearing effects”, discomfort has been reported as the most frequent effect caused by exposure to low-frequency noise in humans [1,31,32].

In addition, the discomfort may vary from individual to individual and depends not only on the recorded noise pressure levels but also on the exposure time as well as the low-frequency components present in the measured sound levels. Thus, noise that contains low-frequency components tends to be more annoying than noise without them [1,33–35].

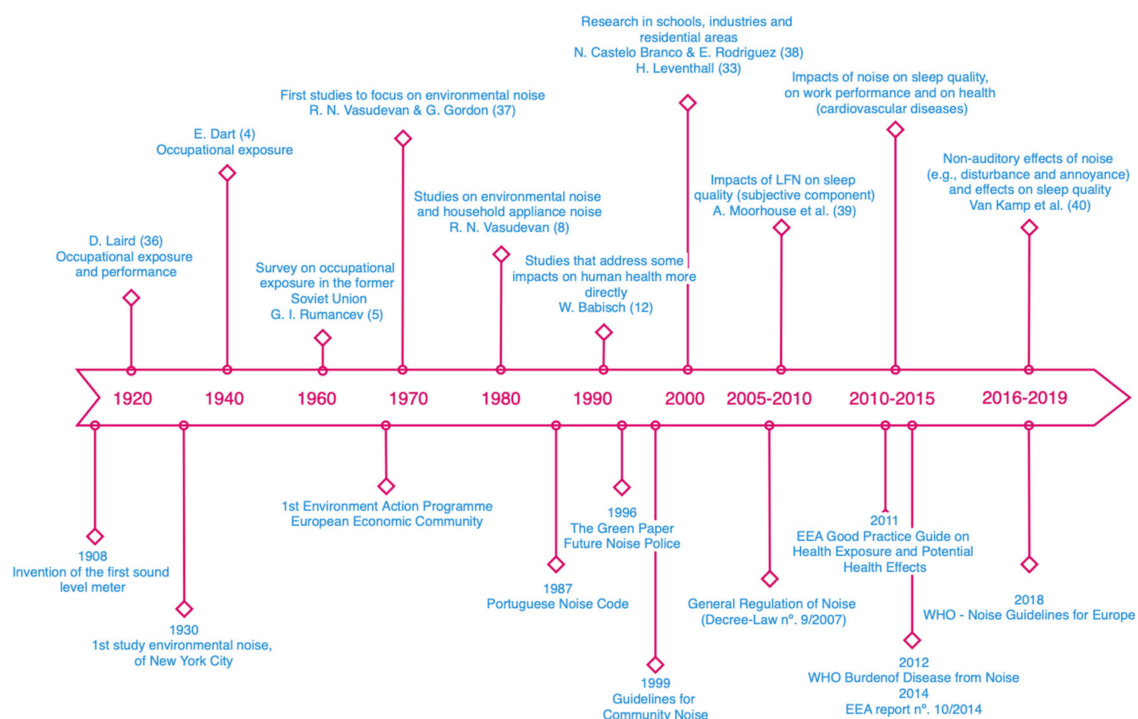


Figure 1. A summary regarding health effects due to low-frequency noise exposure. Source: own elaboration based on several authors [4,5,8,12,36–40].

Since 2000, the WHO has recognized low-frequency noise as an environmental problem. In addition, the health impacts of low-frequency components on noise are estimated to be more severe [1,33–35].

The WHO published its most recent noise pollution guidelines for Europe in 2018. This publication states that further research into the health impacts from wind turbine noise is needed, namely, the low-frequency component [35].

In fact, a systematic review of the up-to-date, peer-reviewed, epidemiological literature has been performed on the association between low-frequency noise and its effects on human health. The present paper aims to fill this gap in the literature.

The paper is structured into four sections. After the introduction, the methodology is outlined. A systematic review regarding scientific articles about low-frequency noise and its impacts on human health is presented in Section 3. The article concludes by highlighting the main conclusions of an in-depth analysis of 39 articles published between 2016 and 2019, some limitations of the research, and recommendations for further studies.

2. Materials and Methods

Database Collection

The original papers were identified by a literature search between October and December 2019 of all of the principal accessible journals and databases (PubMed, Web of Science, and Scopus) concerning the theme and using the following keywords: “low-frequency noise”; “low-frequency noise and its effects on health”; “noise pollution and health”. A database was constructed with some variables, e.g., sample results and main noise sources. A total of 142 articles published between 2016 and 2019 was found (Supplementary Materials). Only studies were included in which it was mentioned in the title or abstract that the association between the low-frequency noise and effects concerning health or well-being was studied.

The 142 papers selected for the period from January 2016 to December 2019 were grouped into 9 categories: reviews; health effects due to noise and noise pollution; low-frequency sound/infrasound; health LFN case studies (small population); health LFN case studies (large population); LFN case studies (animals); laboratories studies, simulation studies, and computational case studies; and not relevant. A total of 39 articles published between 2016 and 2019 and grouped in the categories “health LFN case studies (small population)”, “health LFN case studies (large population)”, and, finally, “LFN case studies (animals)” were selected for in-depth evaluation. The evaluation carried out focused on the impacts on health, highlighting the incidence of studies aimed at human health and others aimed at carrying out tests on animals that may lead to a future study on humans. Additionally, the 39 articles evaluated used similar techniques (e.g., questionnaires; data previously collected in other studies; cognitive, physiological, and psychological tests based on medical and auditory equipment; noise measurements and audiometric assessments; and experimental tests based on noise exposure). The 39 articles evaluated were carried out mostly in Asian and European countries and were based on small samples.

3. Results and Discussion

This section presents the main results obtained from the analysis of articles published on low-frequency noise and its impacts on human health between 2016 and 2019. The results and discussion are structured in five sections on the main effects of low-frequency noise exposure on human health. Each section begins with a description of the methodologies used, followed by the main results achieved in the studies analysed.

3.1. Low-Frequency Noise Exposure and Its Main Health Effects

Table 1 presents a synthesis of the 39 articles based on three of the categories listed in the methodology section. These categories were as follows: cases of low-frequency noise studies in a small population, in a large population, and in a population of animals.

Of the 39 articles that were included in the evaluation of this article, it was observed that the main effects on human health are more prevalent in aspects such as sleep disorders (11.7%), discomfort, sensitivity and irritability to noise (10%), annoyance (13.3%), stress (6.7%), hearing loss (8.3%), reduced performance/fatigue (5%), heart rate/cardiovascular diseases (10%), tension and blood pressure (6.7%), anxiety (1.7%), depression (3.3%), imbalance (3.3%), and mental performance (6.7%).

There were also other effects on human health but with an incidence in very specific aspects (13.3%), such as the frequency of chromosomal aberrations in bone marrow cells, excess bilirubin, peptic ulcers (gastric and duodenal), effects on the cerebral blood barrier, haemodynamic events, irreversible imbalance with structural damage to the otoconial membrane, tinnitus and sound reconversion therapy, and vocal disorders and effort.

Only the effects on human health related to sleep disturbance, noise discomfort, annoyance, hearing loss, and cardiovascular disease were analysed, as these were the themes where a greater number of articles were observed, thus allowing a better comparison and evaluation between the various articles.

3.2. Sleep Disturbance

Sleep disturbance is one of the effects on human health that is due to exposure to noise, in particular, low-frequency noise. Long-term exposure to low-frequency noise from wind energy is a major factor in sleep disturbances in residents who live near wind farms. Abbasi et al. [41], Morsing et al. [42], Ishitake [43], Pohl, Gabriel, and Hübner [44], and Poulsen et al. [45] evaluated exposure to low-frequency noise due to proximity to wind turbines. The methodology adopted included the measurement of sound levels and, after the exposure of participants to wind turbine noise, an assessment of sleep disturbances.

The studies [41–43] applied questionnaires to participants to assess the disturbances they felt after exposure to noise. In the study by Abbasi et al. [41], in addition to the questionnaire, Pearson's correlation, analysis of variance, and multiple regression tests were applied for data analysis using software. Morsing et al. [42] evaluated the impact of noise on sleep as measured by polysomnography, after participants were exposed to wind turbine noise for three consecutive nights. Finally, Ishitake [43] assessed sleep disorders using the Athens Insomnia Scale method, based on the responses of participants when exposed to noise.

In the study designed by Pohl, Gabriel, and Hübner [44], the methodology of stress psychology with noise measurement was adopted, ascertaining the physical and psychological symptoms referenced by residents that participated in the study (general mental indisposition, performance and reduced work capacity, lack of concentration, fatigue, tension, nervousness, negative mood, dizziness, irritability, indisposition, reduced sleep quality, and annoyance) caused by exposure to noise from wind turbines. Moreover, Poulsen et al. [45] evaluated the evolution of medical prescriptions related to anxiolytics and antidepressants ingested by the populations living near the wind turbines, in an analysis that lasted two years (2012 to 2014).

Sleep disturbances may also be due to exposure to noise from oil and gas operations, namely in the construction and drilling of wells in residential areas [46]. Blair et al. [46] evaluated the impacts of these operations on human health, including sleep disorders. Sleep disturbances can also be linked to exposure to railway noise, as studied by Smith et al. [47]. They [47] evaluated the effects on physiological sleep resulting from the exposure of participants to railway noise for five consecutive nights, using polysomnography and questionnaires.

As for the results, Abbasi et al. [41] evaluated the effects of noise from wind turbines on the health of employees, divided into three groups (maintenance, safety, and administration). The group with the greatest exposure to noise was the maintenance team, who were considered as a reference group. Maintenance workers were subject to a higher sound level because they are in the vicinity of wind turbines, and higher GHQ (The General Health Questionnaire) scores were also recorded (the health assessment tool for individuals used in the study). Therefore, compared to those on management and safety staff, the harmful health effects of wind turbine noise are stronger on maintenance workers.

The questionnaire was divided into four sections, including somatic symptoms, anxiety and insomnia, social dysfunction, and depression. Based on the results obtained in this study, only the equivalent sound level had a significant effect on the general state of health and in some of its sections. The negative impact of noise exposure of 60 and 66 dBA on general health was approximately six and four times less than that of 83 dBA, respectively. The adverse effect of 60 dBA noise exposure in the anxiety and insomnia section was 1.6 times less than that in the 83 dBA exposure group. The effect of the experiment in the anxiety and insomnia section was 0.2 times greater than that of the 83 dBA noise exposure. This result indicates that the worst health status is due to working conditions and chronic exposure to occupational risk factors, such as noise. The results show that the effect of exposure to noise of 66 dBA in the social dysfunction section was 2.3 times less than that of 83 dBA noise. It was concluded that exposure to noise is significantly correlated with all subsections of general health, except depression. As a general evaluation of the article, the low-frequency noise from the turbines can cause harmful effects on the health of workers who are very close to the turbine, due to the reception of very intense noise [41]. By convention, a frequency A-weighting filter is used in low-frequency noise evaluation [3]. As a matter of fact, the A-weighting filter is not suitable for assessing the effects of low-frequency noise because this filter drastically reduces the low-frequency levels measured [3].

The results obtained by Morsing et al. [42] are due to the measurement of the effects of night noise from wind turbines on sleep measured physiologically in the laboratory. During nights with noise from the turbines, there was some incidence of participants with frequent awakening, less deep sleep, reduced continuous sleep, an increase in sleep disorders self-reported by the participants, and morning tiredness after the nights of noise exposure compared to nights without exposure to noise. Some evidence was observed in the study in which amplitude modulation and rotational frequency were varied; deeper sleep was negatively affected due to higher frequency and strong amplitude modulation while light sleep increased with high frequency and acoustic beat [42].

Blair et al. [46] monitored continuous levels of audible and low-frequency noise during the construction and drilling of oil and gas wells in a residential area. The equivalent monthly levels of continuous noise varied between minimum values of 51.5 and 73.1 dBC, and maximum values of 60.2 to 80.0 dBC. On the one hand, Blair et al. [46] found that continuous weighted noise levels above 50 dBA can have effects on health, such as increasing the risk of cardiovascular disease and hypertension. On the other hand, they found that low-frequency noise levels that exceeded the recommended level of 60 dBC caused nausea and headaches. In a general analysis of the article, the average noise levels in an oil and gas well during construction and drilling exceeded the levels associated with annoyance, sleep disturbances, and cardiovascular health effects; that is, they were higher than 50 dBA or 60 dBC [46].

Ishitake [43] conducted an epidemiological study that suggests that the noise generated by wind power generation facilities may be a risk factor for effects on human health, especially sleep disturbances. In this study regarding sleep disturbances caused by infrasound, it was found that the noise level of the wind turbine measured in the lower frequency range is below the human sensory threshold. As mentioned by Ishitake, 63% reported having sleep disturbance; the effect was reduced with increased distance between the source and the receiver [43].

Pohl, Gabriel, and Hübner [44] carried out a study that combined the methodology of stress psychology with noise measurement. They conducted interviews with residents who lived close to a wind farm and assessed their perception of noise from the wind farm and road traffic at two different points in time, first in 2012 and later in 2014. Residents complained of physical and psychological symptoms due to traffic noise (16%) and noise from wind turbines (10% and 7% in 2012 and 2014, respectively). In the study, 12 symptoms caused by exposure to noise were evaluated. It was found that the participants reported more symptoms in 2012 than in 2014 and the most strongly irritated participants considered their overall health in 2014 to be improved. The sleep disorders assessed decreased from 2012 to 2014. Distraction also decreased slightly from 2012 to 2014 for the most irritated residents, while remaining relatively low and/or unchanged in the other groups. However, only a few participants showed evidence of noise from low-frequency wind turbines: in 2012, 8.5% reported

feelings of pressure related to wind farms and 6.1% reported having felt vibrations in the body; in 2014, these feelings decreased to 6.8% and 3.8%, respectively. The annoyance experienced was very low, and symptoms of dizziness were not observed in this study. Regarding the effects of wind noise stress compared to road traffic noise, there were more reports of symptoms due to traffic (15.8%) than to noise from wind turbines. In 2014, it was observed that about a third (34.9%) of the participants were slightly irritated by traffic noise and 21.2%, by noise from the wind farm [44].

Poulsen et al. [45] determined the numbers of prescriptions for anxiolytics and antidepressants for residents due to prolonged exposure to noise from wind turbines. During the survey carried out between 1996 and 2013, 68,696 adults had recourse to sleeping pills and 82,373 used antidepressants, out of a population of 583,968 and 584,891, respectively. In this study, it was observed that people over the age of 65 years were more affected by the noise of wind turbines, with an HR (hazard ratio) of 1.68 for measuring sleep and 1.23 for antidepressants being found for the group with the greatest exposure. Regarding low-frequency noise due to wind turbines in indoor environments, the risk rate among people aged 65 and over when exposed to noise equal to or higher than 15 dB was 1.37 for anxiolytics and 1.34 for antidepressants. Thus, Poulsen et al. [45] concluded that the combination of high noise levels from wind turbines and the use of anxiolytics and antidepressants can induce sleep disturbance and, in turn, affect the mental health of the elderly [45].

Finally, Smith et al. [47] demonstrated that sleep was significantly affected, both in terms of physiological measures and by self-report, during nights with exposure to 45 dB noise, although the number and size of the effects were modest. Most self-reported sleep measures were adversely affected by terrestrial railway noise. In this study, no significant differences were found in the general sleep structure or disorders and in the subjective quality of sleep between the reference tests and the 35 dB night tests. The results obtained support the value of the Swedish guidelines proposed for the maximum noise level of 35 dB for indoor environments and may be suitable for protection against adverse sleep problems due to terrestrial railway noise [47].

3.3. Discomfort from, Sensitivity to, and Irritability from Noise

Discomfort, sensitivity to noise, and irritability are other effects on human health due to exposure to low-frequency noise.

Huang, Pan, Liu, Hou, and Yang [48] analysed acoustic comfort and developed a noise analysis model for a skyscraper by measuring exterior noise, mainly from road traffic.

Suzuki, Suzuki, Onishi, and Penido [49] performed audiometric assessments on patients with persistent tinnitus, through their perception of sounds of nature and everyday life and their comparison with a pure tone or noise (white noise, narrow-band low frequency and narrow-band high frequency). The assessments considered in the patients were otorhinolaryngological, audiological, Pitch Matching and Loudness, Visual Analogue Scale, Tinnitus Handicap Inventory, and Minimum Masking Level [49].

Lee et al. [50] determined the effects of exposure to transport noise and established a relationship with the blood pressure of residents of residential buildings. They determined noise exposure levels (L_{den} , L_{day} , and L_{night}) through adjusted linear regression analysis and established the relationship with blood pressure [50]. They also conducted a questionnaire related to the annoyance caused by internal noise, noise sensitivity, and sociodemographic variables [50].

Tao, Wang, Zou, Li, and Luo [51] assessed the irritation from noise in a metro depot and the influence of noise in adjacent residential buildings. They carried out a questionnaire with people working at the metro station and took field measurements, both at the metro station and in the adjacent residential buildings [51].

Moradi et al. [52] studied the effects of noise on the selective attention of university students. They conducted questionnaires to determine students' personality traits; that is, they assessed whether they were extroverted or introverted and analysed their stability or instability [52]. In addition, they also assessed the level of sensitivity to noise using the Weinstein sensitivity scale and the level of selective attention using the DUAF test from the Vienna Test System [52].

Alves, Silva, and Remoaldo [53] analysed the effects of exposure to low-frequency noise pollution emitted by poles and power lines on the well-being of the population, based on a study carried out on “exposed” and “unexposed” populations in two residential areas. Additionally, adapted audiometric tests were carried out to complement the analysis and determine the audibility thresholds of “exposed” and “unexposed” volunteers. To develop the research, Alves, Silva, and Remoaldo [53] used sound level measurements and sound recordings (recordings made at a distance of 5 m from the source), as well as the adapted audiometric performance test [53].

Regarding the results, [48] observed that, due to the effect of the ground, the effect of medium propagation, and the different frequency components, the comfort of the sound does not increase with distance from the ground, that is, on the highest floors. They concluded that low-frequency noise has great potential for the annoyance and discomfort of the residents of the building.

Suzuki et al. [49] identified 181 tinnitus complaints in which pure-tone-type tinnitus was observed in 93 (51%) of the responses (4 low pitch and 89 high pitch) and from noise in 88 (49%) responses (15 low frequency and 73 high frequency). Regarding tinnitus with a low-frequency sensation, 19 responses were determined, while for that with a high-frequency sensation, 162 responses were found. They determined a Visual Analogue Scale average of 5.47 for tinnitus similar to pure tone and 6.66 for that similar to noise, with a higher value for noise. The average loudness of tinnitus similar to pure tone was 12.31 dBNS, and that similar to noise was 10.54 dBNS. For the Tinnitus Handicap Inventory and the Minimum Masking Level, the patients considered in the study were separated into three groups with tinnitus, pure tone, noise, and multiple, with the mean of the largest Tinnitus Handicap Inventory in the group with multiple tinnitus being 61.38. For the Minimum Masking Level, masked noises of the type white noise and narrow band [49] were used.

Lee et al. [50] concluded that general noise (road and rail traffic) and road traffic showed higher associations with systolic blood pressure (SBP) than with diastolic blood pressure (DBP), while rail noise had similar associations with SBP and DBP. They also observed that the closest associations between exposure to noise and blood pressure were estimated for participants who reported higher classifications of annoyance, irritation, and sensitivity to noise. This indicates that the annoyance of internal noise and sensitivity to noise develop regardless of the level of exposure to external noise. They also found that people who were sensitive to noise and participants who were most irritated due to internal noise had significantly higher SBP and DBP than the rest. In addition, the regression coefficients between noise exposure and blood pressure increased slightly in a subgroup that excluded participants exposed to high railway noise [50]. The results established by Lee et al. [50] support the hypothesis that long-term exposure to transport noise is associated with higher blood pressure in adults living in multi-storey residential buildings.

Tao et al. [51] concluded that 96% of respondents feel disturbed by noise and 31% of them feel that the impact of noise is serious. They noted that closing doors in buildings may be a solution, but only a reduction in noise from the low-frequency structure in the range 63 to 125 Hz occurs. They found that there is a problem of annoyance from low-frequency noise. They evaluated that the noise level caused by the fans decreases with the height of the floors. Ventilation noise is one of the dominant noise sources for adjacent buildings, and, therefore, they found that the shorter the distance between the building’s fans and ventilation, the more severe the impact of the noise. They also concluded that the noise attenuation rate increases with an increase in the distance to the noise source [51].

Moradi et al. [52] concluded that there were no significant differences in the average time spent on correct answers before and after exposure to noise between extroverted and introverted participants; however, there was a significant difference among extroverts in the average time spent on correct answers before and after exposure to noise. The results showed that introverted participants are more sensitive to noise than extroverts. The most noise-sensitive participants showed greater stimulation during exposure to noise, which led to increases in incorrect responses and a decrease in mental performance. Moradi et al. [52] found that the participants’ personal traits are related to their annoyance

due to noise. Moradi et al. [52] concluded that stress due to noise improves selective attention in extroverted individuals.

Finally, Alves et al. [53] concluded that the “exposed” area has higher sound levels and, consequently, more problems with well-being and health than the “unexposed” population. Audiometric tests also revealed that the “exposed” population seems to be less sensitive to low-frequencies than the “unexposed” population; that is, the “exposed” group needs a higher sound intensity to perceive noise, especially at lower frequencies. The “exposed” group has a larger number of respondents with health problems (e.g., cardiovascular disease, insomnia, and depression), which can be caused by exposure to low-frequency noise emitted by power poles and lines. On the other hand, the “unexposed” group tends to perceive noise with a slightly lower sound intensity, due to the fact that this residential area is far from the emission source [53].

3.4. Annoyance

Annoyance is another effect on human health due to exposure to low-frequency noise.

Boyle et al. [54] assessed how the A-weighted exposure levels differed indoors and outdoors in homes in the vicinity of a natural gas compressor station, where low-frequency noise was found. They performed measurements of the noise levels defined in the A-weighted scale to filter most of the low-frequency noise and in the C-weighted scale to identify the impulse noise (noise measured in less than one second with peak levels 15 dB higher than the background noise) [54].

Van Kamp, Breugelmans, Van Poll, Baliatsas and Van Kempen [40], and Lee et al. [50] presented questionnaires to assess issues related to annoyance due to noise. Van Kamp et al. [40] surveyed complaints due to low-frequency noise using existing data and by means of a questionnaire determining participants’ annoyance due to noise from road, rail, and air traffic sources, low-frequency noise, construction noise, and noise sensitivity; the residential satisfaction index; and a survey of measures applied in the residence to avoid noise. As for the study by Lee et al. [50], the methodologies adopted are referenced in Section 3.3.

The methodologies adopted by Blair et al. [46] and Pohl, Gabriel, and Hübner [44] are referenced in Section 3.2. However, according to [46], noise levels above 50 or 60 dBA can cause annoyance.

Ishitake [43] assessed the level of annoyance regarding the source of low-frequency noise generated by wind energy and road traffic noise, by conducting a questionnaire to obtain these perceptions.

According to Hansen et al. [55], the presence of amplitude modulation in wind farm noise results in increased annoyance and possible sleep disruptions. The developed study investigated the prevalence of this characteristic in homes close to the wind farm [55]. In the article by Hansen et al., several important variables were considered, namely, the receiver-source distance, meteorological conditions, and proximity to reflective surfaces, among others.

Moradi et al. [52] assessed the level of selective attention through the DUAF test (test of selective attention, performance capacity, and general performance) and the level of annoyance based on the ISO15666 (International Organization for Standardization, 2003), based on the study sample referenced in Section 3.3.

As for the results, Boyle et al. [54] found that houses located close to a compressor station have higher average noise levels, both indoors and outdoors, than houses located at a distance greater than 300 m. The authors also found that noise levels during the day were higher than those recorded at night and that the residents of residences located less than 300 m from the station were exposed to low-frequency noise. In this study, they established the relationship of the results with the daytime and nighttime noise levels recommended for the prevention of hearing loss and annoyance, established by the WHO [56,57], and found that the average noise levels determined exceeded these guidelines [54].

Table 1. Studies selected and health effects related to low-frequency noise.

| Year | Studies | Studies Evaluated | | | | |
|------|--|-------------------------------|---|---|---|--|
| | | Number of Participants/Sample | Main Human Health Effects | Methodology | Exposure | Outcomes |
| 2016 | Zeitooni, Mäki-Torkko and Stenfelt [66] | 27 | Binaural hearing capacity | Evaluation of binaural auditory capacity in adults with normal hearing when bone conduction stimulation is applied bilaterally in the bone conduction hearing aid implant position, as well as in the audiometric position in the mastoid. | Exposure to low-frequency noise (400 to 600 Hz) and high-frequency noise (3000 to 5000 Hz). | The results confirmed that the binaural auditory processing with bilateral bone conduction stimulation in the mastoid position is also present in the bone conduction hearing aid (BCHA) implant position. This indicates the capacity for binaural hearing in patients with good cochlear function when using bilateral BCHAs. |
| 2016 | Walker, Brammer, Cherniack, Laden and Cavallari [63] | 10 (male) | Heart rate variability and stress | The authors conducted a sound monitoring campaign between February 2015 and February 2016 across the city of Boston, MA. Boston occupies an area of 124 square kilometres with an estimated population of close to 700,000 individuals. To identify potential monitoring sites, the authors divided the city of Boston into 500 × 500 m grid cells using ArcGIS. They constructed a list of all accessible potential sites ($n = 525$), and 400 site locations were randomly selected for monitoring by time of day. Convenience sampling was also conducted in certain areas of the city to ensure adequate coverage of varied land use and urban activity. The participants underwent an outpatient electrocardiogram. Blood pressure measurements and saliva samples were collected before, during, and after exposure to noise. | Low-frequency noise (31.5 to 125 Hz at 75 dB (A)); high-frequency noise (500 to 2 kHz at 75 dB (A)); 50 dB (A) “noise-free” exposure. | During exposure to noise, reductions in heart rate variability of 19% (−35; −3.5) with low-frequency power and 9.1% (−17; −1.1) were observed according to the quadratic difference average between adjacent normal heartbeat intervals. During exposure to low-frequency noise, reductions in heart rate variability of 32% (−57; −6.2) with high-frequency power, 34% (−52; −15) with low-frequency power and 16% (−26; −6.1) according to the standard deviation of the adjacent normal heartbeat intervals. During exposure to high-frequency noise, reductions in heart rate variability of 21% (−39; −2.3) with low-frequency power compared to that with exposure to noise. |
| 2016 | Liu, Young, Yu, Bao and Chang [67] | 1002 | Hypertension and blood pressure | Personal noise measurements and environmental analysis of octave bands were carried out to divide workers into similar exposure groups based on the similarity and frequency of the tasks they performed in the company, thus creating a high exposure group (≥ 80 dBA), another of medium exposure (75–79 dBA), and another of low exposure (< 75 dBA). | Noise at frequencies of 31.5 Hz, 63 Hz, 125 Hz, 250 Hz, 500 Hz, 1 kHz, 2 kHz, 4 kHz, and 8 kHz during the working period. | Participants exposed to ≥ 80 dBA for 8 years had a higher relative risk of hypertension (relative risk = 1.38, 95% confidence interval: 1.02, 1.85) than those exposed to < 75 dBA. Significant exposure–response patterns were observed between incident hypertension and the stratum of exposure to noise at frequencies of 250 Hz, 1 kHz, 2 kHz, 4 kHz, and 8 kHz. The strongest effect was found at the frequency of 4 kHz, and a 20 dBA increase in noise exposure at 4 kHz was found to be associated with a 34% higher risk of hypertension (relative risk = 1.34, confidence interval of 95%: 1.01, 1.77). |
| 2016 | Selander et al. [58] | 1,422,333 | Hearing dysfunction in children due to noise during pregnancy | Occupational noise exposure during pregnancy, according to the prospective cohort study, FENIX (foetal noise exposure), based on births between 1986 and 2008. | Low-frequency noise (< 75 dBA); high-frequency noise (≥ 85 dBA); medium-frequency noise (75–84 dBA). | In the sample, in a mixture of part-time and full-time workers during pregnancy, HR adjusted for hearing impairment associated with exposure to maternal occupational noise ≥ 85 vs. < 75 dB LAeq, 8 h was 1.27 (95% CI: 0.99 1.64; 60 exposed cases). When restricted to children whose mothers worked full time and had less than 20 days of absence during pregnancy, the HR was 1.82 (95% CI: 1.08, 3.08; 14 exposed cases). |

Table 1. Cont.

| Year | Studies | Studies Evaluated | | | | |
|------|--|-------------------------------|---|---|--|--|
| | | Number of Participants/Sample | Main Human Health Effects | Methodology | Exposure | Outcomes |
| 2016 | Abbasi et al. [41] | 53 | General health; somatic symptoms; anxiety; insomnia; social dysfunction; depression | Study of the effect of wind turbine noise on the general health of employees at a wind farm, with workers divided into three groups: maintenance, security, and office workers. Equivalent sound levels were measured for each group. The individuals' health data were assessed using a 28-item questionnaire. Pearson's correlation, analysis of variance, and multiple regression tests were performed for data analysis using software. | In the maintenance team, an LAeq of 83 dBA was considered, an LAeq of 66 dBA was considered in the security team, and an LAeq of 60 dBA, in the administration team. | Exposure to noise is significantly correlated with all subscales of general health, except depression. The low-frequency noise from the turbines can cause harmful effects on the health of workers who are very close to the turbine and receive very intense noise. |
| 2016 | Wang et al. [59] | 2700 | Cardiovascular diseases; hearing loss. | The authors carried out the study in the metropolitan area of Taichung, Taiwan and set up 50 monitoring stations to collect related information on noise measurements, traffic flow rates, speed limits, and meteorological data. The 50 monitoring stations included 4 agricultural areas, 6 green-land areas (e.g., parks, forests, and mountains), 2 conservation areas, 8 culture-educational areas (i.e., schools, temples, and churches), 11 residential areas, 4 industrial areas, 1 stream-channel area (e.g., harbours), 7 commercial areas, 6 governmental areas (i.e., governmental agencies and institutes), and 1 recreational area. Determination of exposure to traffic noise by measuring the average equivalent noise levels A (LAeq, 24 h) in 50 monitoring stations (25 road traffic stations and 25 non-commercial ones) covering 10 different types of land use. | Equivalent continuous sound levels (Leq, 24 h) in the range of 30–130 dBA; noise levels with the time-weighted average (TWA) at frequencies of 31.5, 63, 125, 250, 500, 1000, 2000, 4000, and 8000 Hz. | The Leq annual average, 24 h in Taichung was 66.4 ± 4.7 dBA, exceeding the threshold for cardiovascular disease prevention. The mean annual Leq, 24 h in the flow and commercial channel areas was 71.2 ± 1.0 and 70.0 ± 2.6 dBA, respectively, revealing a potential risk of hearing loss among residents. The noise levels at 125 Hz had the highest correlation with total traffic and the highest forecast in multiple linear regression. |
| 2017 | Vasilyeva, Bepalov, Semenov, Baranenko and Zinkin [68] | 96 rats | Frequency of chromosomal aberrations in bone marrow cells; levels of low molecular weight DNA (lmwDNA) in blood plasma. | Exposure to single or multiple LFN from male Wistar rats and their comparison with those in the control group. The control group rats were not subjected to any impact. Measurement of the frequency of chromosomal aberrations in bone marrow cells and the levels of lmwDNA in blood plasma. | Frequency below 250 Hz; simple LFN with sound pressure levels (SPL) of 120 dB; multiple LFN with 150 dB SPL. | Blood plasma lmwDNA levels measured the following day after a single exposure to LFN were significantly higher (7.7 and 7.6 times, respectively) than in the control group (11.0 ± 5.4 ng/mL), and these levels were higher (4.8 and 2.1 times, respectively) in the week after a single exposure of LFN to the SPL of 120 and 150 dB, respectively, than in the control group (18.8 ± 1.6 ng/mL). Similar results were obtained in the group with multiple exposures to LFN (36.4 and 22.4 times, respectively) compared to the control group (17.7 ± 1.7 ng/mL) and suggest an increase in cell apoptosis as a result of impact of the LFN. |
| 2017 | Boyle et al. [54] | 11 | Noise disturbance from natural gas compression stations. | Assessment of how A-weighted exposure levels differ indoors and outdoors in homes near the natural gas compressor station, where low-frequency noise was found. Measurement of noise levels defined in the A-weighted scale to filter out most of the low-frequency noise and in the C-weighted scale to identify the impulse noise. | - | Houses located close to a compressor station have higher average noise levels, both indoors and outdoors, than houses located more than 300 m away. Noise levels during the day were higher than at night. Residents of residences located less than 300 m from the station were exposed to low-frequency noise. The daytime and nighttime noise levels recommended for preventing hearing loss and annoyance were exceeded. |

Table 1. Cont.

| Year | Studies | Studies Evaluated | | | | |
|------|--|-------------------------------|---|---|---|---|
| | | Number of Participants/Sample | Main Human Health Effects | Methodology | Exposure | Outcomes |
| 2017 | Van Kamp, Breugelmans, Van Poll, Baliatsas and Van Kempen [40] | 3972 | Annoyance due to low-frequency noise | Survey of complaints due to low-frequency noise, based on analysis of existing data. Conducting a questionnaire with participants addressing aspects such as annoyance and sensitivity to noise, sources of emission, and residential satisfaction, among others. | - | The level of background noise, sensitivity to noise, and dissatisfaction with the residential situation were strongly associated with higher levels of annoyance. The lower the background noise levels, the greater the annoyance due to tinnitus. Low-frequency noise is particularly a problem in places with low levels of background noise. |
| 2017 | Ohgami, Oshino, Ninomiya, Li and Kato [60] | Rats | Hearing loss; imbalance | Conducting an experimental study in which wild type rats were exposed to similar low-frequency noise and the assessment of noise-induced hearing loss and determination of the rats' imbalance. | Low-frequency noise (70 dB, 100 Hz) | The authors observed that a sound stimulation at 375 Hz at a frequency lower than the audible range of the rats causes a hearing reduction in wild type rats, and in rats with an abnormal otolytic morphology, this hearing loss was not observed. |
| 2017 | Venet et al. [61] | 117 rats | Effects on hearing | Evaluation of exposure to the combination of low-frequency noise and carbon disulfide. | Low-frequency noise, ranging from 0.5 to 2 kHz at an intensity of 106 dB SPL. | Exposure to CS ₂ (250 ppm or more) and noise increased the extent of the damaged frequency window, as a significant hearing deficit was measured at 9.6 kHz in these conditions; in addition, the significance at 9.6 kHz increased with solvent concentrations. Histological data showed that neither hair cells nor ganglion cells were damaged by CS ₂ . |
| 2017 | Alimohammadi and Ebrahimi [69] | 89 | Mental performance | All participants underwent the Stroop and Cognitrone tests in silent conditions, after 30 min of exposure to LFN and HFN. The Cognitrone test assesses concentration and attention, and the Stroop interference test is a sensorimotor speed test that records the performance of reading speed. | Low-frequency and high-frequency noise at 50 and 70 dBA. | Both noises emitted (LFN and HFN) not only caused precision in scaling the response but also reduced the duration of the test run. It was concluded that, disregarding the distribution of energy frequencies, noise improved the task performance of participants. The results illustrated that individuals under LFN performed the Cognitrone test more quickly than individuals under HFN. |
| 2017 | Huang, Pan, Liu, Hou and Yang [48] | - | Noise disturbance | Analysis of acoustic comfort and development of a noise analysis model for a skyscraper, through the measurement of exterior noise, mainly road traffic noise. The selection of measuring points was made on the horizontal and vertical planes and strictly follows the guidelines (Chinese standard JTG B03–206 and HJ 2.4-2009). The noise measurement instruments were an AWA6270+B noise analyser, AWA6228 frequency analyser, and TES1350A sound level meter. | - | A higher capacity to respond to high-frequency than low-frequency mining noise (LF) was observed, which probably reflects the audibility of the two frequency spectra. |
| 2017 | Mancera, Lisle, Allavena and Phillips [70] | 57 rats | Effects on behaviour (stress), organ morphology, and faecal corticosterone. | Evaluation of the effects of noise from mining machines on the behaviour and physiological parameters (organ morphology and faecal corticosterone) of wild rats, when subjected to high- and low-frequency ranges, and comparison with a reference treatment without auditory stimuli. | High-frequency noise (>2 kHz); low-frequency noise (≤2 kHz). | The frequencies below and above 2 kHz had differential effects on male and female wild rats that can have important consequences for their well-being and survival. |

Table 1. Cont.

| Year | Studies | Studies Evaluated | | | | |
|------|---|-------------------------------|--|---|---|---|
| | | Number of Participants/Sample | Main Human Health Effects | Methodology | Exposure | Outcomes |
| 2018 | Morsing et al. [42] | 12 | Sleep effects | Evaluation of sleep effects, through polysomnography measurement and questionnaires, in 2 pilot studies, due to noise exposure from wind turbines. Six participants spent five consecutive nights in an ambient sound laboratory and, for three nights, were exposed to the noise of the wind turbine with the variation of some parameters. | High-frequency (>125 Hz) and low-frequency noise (125 Hz). Similar to a ventilation noise, a low background noise (18 dB LAeq) was used. | During nights with noise from the wind turbine, there were sleep disturbances compared to during control nights. Deeper sleep was negatively affected by higher rotational frequency and amplitude modulation, but light sleep increased with high rotational frequency and acoustic beat. |
| 2018 | Blair, Brindley, Dinkeloo, McKenzie and Adgate [46] | 4 (residences) | Annoyance, sleep disorders, and cardiovascular effects | Determination of noise levels in a well block of oil and gas operations of several wells during construction and drilling in a residential area in Colorado and the verification of impacts on human health. A (dBA) and C (dBC) weighted noise measurements were collected at four residences located between 320 (1049.9 ft) and 550 m (1804.5 ft) from the site during development over a three-month period (February to April 2017). | A and C weighted noise levels of 60.2 dBA and 80 dBC, respectively. | Proportionally, 41.1% of continuous daytime equivalent daytime measurements and 23.6% of 1 min dBA exceeded 50 dBA, and 97.5% of daytime and 98.3% of nighttime measurements exceeded 60 dBC. Average noise levels in an oil and gas well during construction and drilling exceed levels associated with annoyances, sleep disturbances, and cardiovascular health effects (greater than 50 dBA or 60 dBC) in studies involving noise sources such as traffic, airports, wind turbines, and rail-related noise pollution. |
| 2018 | A.M. Abbasi, Motamedzade, Aliabadi, Golmohammadi and Tapak [71] | 35 | Physiological effects and mental health (fatigue) | Participants were exposed to low-frequency noise and were ultimately asked to determine their level of mental fatigue. A cognitive test was performed to assess working memory (low, medium, or high workload). Software was used to assess mental fatigue, visual fatigue analogue scale, and psychophysiological indexes. | Low-frequency noise levels of 55, 65, 70, and 74 dBA. | The results showed that mental fatigue significantly affected heart rate, low- to high-frequency rates, and electroencephalogram rates. The results confirmed that the mental fatigue caused by low-frequency noise significantly impacted the participants' psychophysiological and working memory with exposure to noise levels of 65 to 75 dBA. |
| 2018 | Ninomiya et al. [72] | 44 rats | Stress | A comparison of auditory levels and levels of expression of the Hsp70 protein in the cochlea was performed between rats exposed and not exposed to LFN. | Low-frequency noise (100 Hz to 95 dB). | The results showed that the inner ear may be one of the organs negatively affected by the stress caused by the inaudible exposure to LFN. Exposure to LFN increases the level of Hsp70 expression via Cebpb in the inner ear. The levels of Hsp70 and Cebpb may be candidates for biomarkers of responses to exposure to LFN. |
| 2018 | Rossi, Prato, Lesina and Schiavi [65] | 25 (19 to 29 years) | Physiological effects (response time and heart rate) | The experiment involved 25 Italian volunteers (12 female and 13 male volunteers), aged 19–29 years. Before starting the test, each subject filled in a general questionnaire specifying age, occupation, musical experience, eyesight and hearing problems, and the presence of noise in their daily life. Measurement of changes in cognitive and physiological parameters in a sample of volunteers exposed to three types of noise in a hemi-anechoic room. Participants were involved in a cognitive task (Stroop effect) for 10 min in four different conditions: silence, multi-tonal broadband (BBN) stochastic noise, low and low-frequency stochastic noise (LFN1), and low-frequency stationary noise with regular amplitude modulation (LFN2). | Sounds reproduced with a sound pressure level equivalent to 93 dB; BBN noise based on frequencies between 315 and 2000 Hz; LFN1 with frequencies between 30 and 60 Hz; LFN2 with frequencies between 30 and 200 Hz. | In noise conditions, participants reduced their response times, that is, there was evidence of increasing stress. Dividing the participants into extroverts and introverts, it was demonstrated that LFN1 and LFN2 produced higher stress effects than BBN noise on cognitive performance and a physiological stress comparable to that produced by BBN noise. |

Table 1. Cont.

| Year | Studies | Studies Evaluated | | | | |
|------|--------------------------|--|---|--|--|---|
| | | Number of Participants/Sample | Main Human Health Effects | Methodology | Exposure | Outcomes |
| 2018 | Zhou and Fu [62] | 1404 | Sensorineural hearing loss (SNHL); excess bilirubin (causes problems in the liver, spleen, kidneys, gallbladder). | Measurements of total serum bilirubin, tympanometry, and determination of the mean threshold of pure tones at low frequencies or high frequencies for a subset of adolescents, to assess levels of total serious bilirubin associated with different subtypes of sensorineural hearing loss. | Low-frequency noise (LPTA: 500, 1000, 2000 Hz); high-frequency noise (HPTA: 3000, 4000, 6000, and 8000 Hz). | Total serum bilirubin levels were associated with any high-frequency SNHL (HPTA > 15 dB in at least one ear) in adolescents in the USA; high-frequency SNHL with HPTA > 15 dB in both ears (bilateral) or with HPTA ≥ 25 dB in at least one ear had a stronger association with total serum bilirubin levels than HPTA > 15 dB in only one ear (unilateral) or HPTA = 15–25 dB in at least one ear. |
| 2018 | Ishitake [43] | 9000 (≥20 years) | Annoyance; sleep disorders | Conducting an environmental epidemiological study and assessing the effects on sleep disturbance due to low-frequency noise generated by wind power installations, based on residents living in areas close to the source. Assessment of sleep disorders using the Athens Insomnia Scale. Assessment of environmental noise in residential areas (50 community centres) close to the noise source by measuring infrared and low-frequency sound exposure levels. | Infrared, low-frequency (20 Hz) and infrasound (<20 Hz). | As for sleep disturbances caused by infrasound (20 Hz or less), the noise level of the wind turbine measured in the ultra-low-frequency range is below the human sensory threshold. Of the participants, 63% heard the noise when the distance was less than 1000 m. However, the hearing rate decreased significantly when the distance was increased to 5000 m, when only 2% of the participants heard the noise. Based on the Athens Insomnia Scale, 40% of participants had sleep disorders when the distance was less than 1000 m. However, the frequency of sleep disorders decreased to 22% with an increase in distance. Amplitude-modulated sounds and pure tones contained in the noise generated by wind power generation facilities tend to increase annoyance. |
| 2018 | Chalansonnet et al. [73] | 133 rats | Balance effects | Study of how exposure to low-frequency noise combined with 250 ppm CS ₂ affects rat balance. Vestibular function was tested based on post-rotational nystagmus recorded by a video-oculography system. These measurements were completed by behavioural tests and cerebellar analysis to measure levels of gene expression associated with neurotoxicity. | Low-frequency noise, ranging from 0.5 to 2 kHz at an intensity of 106 dB SPL. | Coexposure to CS-250 ppm and low-frequency noise reduced the number and duration of the withdrawals by 33% and 34%, respectively. It was observed that the effects of CS ₂ were due to reversible neurochemical disorders of the efferent pathways that manage post-rotational nystagmus. Since the nervous structures that involve vestibular function seem particularly sensitive to CS ₂ , post-rotational nystagmus can be used as an early non-invasive measure to diagnose CS ₂ poisoning as part of an occupational conservation programme. |
| 2018 | Min and Min [74] | 466,822 (217,308 with gastric ulcer + 249,514 with duodenal ulcer) | Peptic ulcer (gastric and duodenal) | Investigation of the incidence of peptic ulcers in adults due to long-term exposure to environmental noise. The diagnosis of gastric and duodenal ulcers was made during an 8-year follow-up (2006–2013). Environmental noise data were obtained from the National Noise Information System, a national noise monitoring system. | The interquartile range (IQR) for nighttime noise exposure was 2.37 dB for gastric ulcers and 2.41 dB for duodenal ulcers. | Gastric ulcers occurred in 32.1% of individuals, and duodenal ulcers, in 10.7% of individuals. The diagnostic rate for gastric and duodenal ulcers increased with increasing cumulative mean levels of nighttime ambient noise. With increases in the IQR of nighttime noise, the risk rate increased significantly by 12% for gastric ulcers and 17% for duodenal ulcers, based on the fully adjusted model. |

Table 1. Cont.

| Year | Studies | Studies Evaluated | | | | |
|------|--|--------------------------------------|---|---|---|--|
| | | Number of Participants/Sample | Main Human Health Effects | Methodology | Exposure | Outcomes |
| 2018 | Pohl, Gabriel and Hübner [44] | 212 (1st phase) and 133 (2nd phase) | General mental indisposition; reduced performance and work capacity; lack of concentration; fatigue; voltage; nervousness; dizziness; irritability; indisposition; reduced sleep quality; annoyance | A total of 212 persons participated in the first survey; nearly two-thirds (133 persons) remained in the second. Accordingly, a third dropped out (“dropouts”; 79 participants). Indeed, dropouts differed statistically from the other participants only in terms of education level and household size. The remaining participants had higher education levels and slightly larger households compared to the dropouts (small effect size for each). These socio-demographic variables had no significant influence on the central stress and attitude indicators; significant differences in the central attitude and annoyance assessments were not apparent. Longitudinal study, based on the methodology of stress psychology with noise measurements, in which residents of a wind farm in Lower Saxony were interviewed on two occasions (2012, 2014), using audio equipment to record irritating noises. Several residents complained of physical and psychological symptoms due to traffic noise (16%) and wind turbine noise (10%; two years later, 7%), which allowed the assessment of some symptoms caused by noise exposure. | Noise from low-frequency wind turbines (<100 Hz). | Participants reported more symptoms in 2012 than in 2014. From 2012 to 2014, sleep disorders decreased and symptoms of impaired performance were not repeated. Only a few participants showed evidence of low-frequency (<100 Hz) wind turbine (WT) noise effects: in 2012, 8.5% reported feelings of pressure related to wind farms and 6.1% experienced vibrations in the body. The annoyance experienced induced by feelings of pressure or vibrations was slightly greater in 2012. Symptoms of dizziness were not observed. The participants had more symptoms and greater irritation due to traffic noise than to wind noise. |
| 2018 | X. Wang, Lai, Zhang and Zhao [75] | 6 (3 exposed, 3 unexposed) Bama pigs | Effects on the blood–brain barrier (BBB) | Investigation of the effect of noise exposure on the blood–brain barrier (BBB). Healthy male Bama pigs were randomly divided into a noise exposure group and a control group (no noise) for 30 min. After exposure, brain imaging was performed using computed tomography and fluorescent images. | Low-frequency noise (50, 70, 100, and 120 Hz at 140 dB). | The BBB permeability test showed that 50, 70, and 100 Hz noise exposure at 140 dB increased the BBB permeability, and the BBB opening at 70 Hz was more severe and reversible. Tomographic images demonstrated that noise-induced opening of the BBB did not cause intracerebral haemorrhage. |
| 2018 | Suzuki, Suzuki, Onishi and Penido [49] | 110 | Tinnitus and LFN discomfort | Classification of persistent tinnitus and its comparison with pure tone or noise, high or low pitch, presented to the patient by the sounds of the audiometer. Participants were subject to inclusion and exclusion criteria. The following evaluations were performed on patients: otorhinolaryngological, audiological, Pitch Matching and Loudness, Visual Analogue Scale, Tinnitus Handicap Inventory, and Minimum Masking Level. | Three types of noise: white noise (WN), narrow band low frequency (LFNB) at 500 Hz, and narrow band high frequency (HFNB) at 6000 Hz. | A total of 181 tinnitus complaints were identified, in which the presence of pure tone type tinnitus was observed in 93 (51%) of the responses (4 from low pitch and 89 from high pitch) and from noise in 88 (49%) of the responses (15 low frequency and 73 high). For tinnitus with low-frequency sensation, 19 responses were determined, while for high-frequency sensation, 162 responses were determined. Visual Analogue Scale average of 5.47 for tinnitus similar to pure tone, and 6.66 for that similar to noise. Average Loudness for tinnitus similar to the pure tone of 12.31 dBNS, and for that similar to the noise of 10.54 dBNS. |

Table 1. Cont.

| Year | Studies | Studies Evaluated | | | | |
|------|---|--|---|--|---|--|
| | | Number of Participants/Sample | Main Human Health Effects | Methodology | Exposure | Outcomes |
| 2018 | Paunović, Jakovljević and Stojanov [76] | 112 (82 women and 30 men, aged 19 to 32). | Blood pressure; haemodynamic events | Study divided into three 10-min phases: resting in quiet conditions before noise, exposure to traffic noise, and resting in quiet conditions after noise. Measurement of blood pressure, heart rate, and haemodynamic parameters (cardiac index and total peripheral resistance) with a chest bioimpedance device. Use of four statistical models to answer the study questions. | Exposure to noise: resting in quiet conditions before noise (Leq = 40 dBA); exposure to noise registered in traffic (Leq = 89 dBA); resting in quiet conditions after noise (Leq = 40 dBA). | Blood pressure decreased during the quiet phase before noise, increased in the first minute of exposure to noise, then gradually decreased at the end of exposure to noise, and continued to decrease to baseline values after exposure to noise. The cardiac index showed a gradual decrease throughout the experiment, while the total vascular resistance increased steadily during and after exposure to noise. |
| 2019 | Negishi-Oshino et al. [77] | Rats | Irreversible imbalance with structural damage to the otoconial membrane | Assessment of rats' imbalance due to acute exposure to LFN. The exposed rats also showed decreased cervical vestibular evoked myogenic potential (cVEMP) with impaired vestibular hair cell activity. | LFN with a frequency of 100 Hz at 85, 90, or 95 dB. | The results of this study demonstrate that acute exposure to LFN at 100 Hz at 95 dB for just 1 h caused irreversible imbalance in rats with structural damage to the otoconial membrane, as the target region for the LFN-mediated imbalance, which could be rescued by Hsp70. |
| 2019 | Lee, Park, Jeong, Choung and Kim [50] | 400 | Discomfort and sensitivity to noise; blood pressure; annoyance due to noise | The study recruited healthy residents aged between 20 and 60 years. Effects of exposure to transport noise on blood pressure in adult residents of multi-storey residential buildings, modification of the effects of discomfort from and sensitivity to internal noise, and self-assessed associations between transport noise and blood pressure. Measurement of noise levels at the top of buildings for 24 h, forecasting the levels of each unit in the house for different sources and periods using noise maps. Conducting adjusted linear regression analyses to estimate associations between noise exposure levels and systolic blood pressure (SBP) and diastolic blood pressure (DBP). Conducting a questionnaire with questions about annoyance from and sensitivity to noise and sociodemographic variables. | Exposure to noise (Lden, LDay, and LNight). | General noise (road traffic and rail noise) and road traffic showed stronger associations with SBP than with DBP, while rail noise had similar associations with SBP and DBP. Stronger associations were estimated for participants who reported higher ratings of annoyance by internal noise. The results support the hypothesis that long-term exposure to transport noise is associated with higher blood pressure in adults living in multi-storey residential buildings. |
| 2019 | Scherer and Formby [78] | 151 | Tinnitus retraining therapy (TRT); sound therapy (ST); tinnitus-specific educational counselling (TC) | Comparison of the effectiveness of TRT and its components, ST and CT, with the standards of care (SoC) in reducing the negative effect of tinnitus on quality of life. Study carried out in 6 military hospitals, in the office and in a data coordination centre, among active, retired, and dependent military personnel with functionally adequate hearing sensitivity and moderate to severe subjective tinnitus, with the objective of treating the military. | LFN (tinnitus). | There were few differences between treatment groups. About half of the participants showed clinically significant reductions in the effect of tinnitus. |

Table 1. Cont.

| Year | Studies | Studies Evaluated | | | | |
|------|--|--|--|--|--|--|
| | | Number of Participants/Sample | Main Human Health Effects | Methodology | Exposure | Outcomes |
| 2019 | Poulsen et al. [45] | Residences between 20 and 40 inhabitants | Annoyance; sleep disorders; depression | Evaluation of the evolution of medical prescriptions related to anxiolytics and antidepressants ingested by the populations that lived near the wind turbines, in an analysis that lasted two years (2012 to 2014). A total of 7256 wind turbines (WT) was considered in noise modelling. The authors collected information on model, type, height, and operational settings. Each WT was classified into one of 99 noise spectra classes, with detailed information on the noise spectrum from 10–10,000 Hz in thirds of octaves for wind speeds of 4–25 m/s. | Exposure to outdoor wind turbine noise (WTN) at night (<24, 24 to <30, 30 to <36, 36 to <42, and ≥42 dB) and nighttime low frequency indoor WTN (<5, 5 to <10.10 and <15, and ≥15 dB). | High levels of outdoors WTN associated with use of anxiolytics and antidepressants among the elderly, suggesting that WTN may be potentially associated with sleep and mental health. |
| 2019 | Tao, Wang, Zou, Li and Luo [51] | 100 | Irritation and sensitivity to noise | Assessment of noise irritation in the metro deposit and the influence of noise in adjacent residential buildings. Conducting a questionnaire with people who worked at the metro station and made field measurements, both at the metro station and in the adjacent residential buildings. | LFN and HFN (31.5, 63, 125, 250, 500, 1000, 2000, 4000, 8000, and 16,000 Hz) | Of respondents, 96% are disturbed by the noise and 31% of them feel that the impact of the noise is serious. They found that there is a problem of annoyance due to low-frequency noise. The authors evaluated that the noise level caused by the fans decreases with the height of the floors and that the shorter the distance between the building's fans and ventilation, the more severe the impact of the noise. They concluded that, with the increase in the distance to the noise source, the noise attenuation rate increases. |
| 2019 | Poulsen et al. [64] | 717,453 | Myocardial infarction (MI), stroke | The authors used the Danish Civil Registration System to identify the study cohort, defined as all adults (aged 25–84 years) who lived in one of these inclusion dwellings any time between five years before the erection of the first neighbouring WT and the end of 2013. Assessment of the impact of MI and stroke risk when there is long-term exposure to noise from wind turbines. Based on hospital and mortality records, an analysis was made of the number of cases of myocardial infarction and stroke that existed in homes located around wind turbines. | Exposure to wind turbine noise (WTN) at night outdoors (≥24 dB) and nighttime low frequency indoor WTN (≥5 dB; 10–160 Hz) | High long-term exposure to noise from wind turbines is associated with an increase in myocardial infarction and strokes. |
| 2019 | Hansen, Nguyen, Zajamšek, Catcheside and Hansen [55] | 9 (residences) A total of 8716 and 8972 10 min samples of outdoor and indoor data | Annoyance | The outdoor measurements carried out at 9 different residences located between 1 and 9 km from the nearest wind turbine of a South Australian wind farm (37 operational turbines), each with a rated power of 3 MW. The wind farm is positioned along the top of a ridge, and the wind turbine hub height relative to the residences varies between 85 and 240 m. At all residences, the indoor measurements were taken in a room that faced as closely as possible towards the wind farm and the windows were closed. The presence of amplitude modulation in the noise of wind farms results in increased annoyance and possible interruptions in sleep. The study investigated the prevalence of this characteristic present in homes close to the wind farm. | - | During the night, audible amplitude modulation occurred in homes located 3.5 km from the wind farm up to 22% of the time. This had important implications for possible sleep disruptions and annoyance due to the wind farm by audible amplitude modelling, particularly as ambient noise levels in rural South Australia can be as low as 15 and 5 dBA, outdoors and in closed areas, respectively. |

Table 1. Cont.

| Year | Studies | Studies Evaluated | | | | |
|------|---|-------------------------------|---|--|---------------------------------------|---|
| | | Number of Participants/Sample | Main Human Health Effects | Methodology | Exposure | Outcomes |
| 2019 | Phadke, Abo-Hasseba, Švec and Geneid [79] | 140 (between 21 and 56 years) | Voice disorders: dysphonia; neck pain; vocal effort | This study aimed to identify possible correlations between the vocal symptoms of teachers and their perception of noise, the locations of schools, as well as the locations and conditions of their classrooms. They carried out a questionnaire, whose answers were analysed statistically, with questions about the severity and frequency of their voice symptoms, noise perception, and the locations and conditions of their schools and classrooms. | - | Teachers experienced severe dysphonia, neck pain, and increased vocal effort with weekly or daily recurrence. Among the teachers who participated in the study, 24.2% felt that they were always in a noisy environment, with 51.4% of the total participants reporting having to raise their voices. The most common sources of noise were student activities and conversations in the teachers' own classrooms (61.4%), noise from adjacent classrooms (52.9%), and road traffic (40.7%). |
| 2019 | Smith, Ögren, Ageborg Morsing and Persson Waye [47] | 23 | Disorders in physiological sleep; heart rate | The study volunteers slept for five nights in a sound environment laboratory, which was furnished like a typical apartment. The participants were instructed to start trying to fall asleep at 23:00 each evening and were woken with an alarm call at 07:00 each morning. Sleeping at times outside of this 8 h period was not permitted. Participants could follow their normal daytime routine but arrived at the laboratory by 20:00 each evening to allow time for relaxation and the setup of the sleep-measuring equipment. Caffeine was prohibited after 15:00 each day, and alcohol was prohibited at all times. Evaluation of the effects on physiological sleep resulting from the exposure of participants to railway noise for five consecutive nights, using polysomnography and questionnaires. Heart rate was measured by electrocardiography. | Frequencies of 35, 40, and 45 dB. | No significant differences were found in the overall structure of sleep disorders between the reference tests and the 35 dB night tests. Regarding cardiovascular diseases, they observed that the noise spectrum with amplitude frequencies greater than 100 Hz led to increases in heart rate for noise levels equal to or greater than 35 dB. |
| 2019 | Zare et al. [80] | 75 | Serum cortisol concentration | The study aimed to examine the effect of sound pressure level (SPL) on the serum concentration of cortisol at three different times during the night shift, in an industrial and mining company. Participants were divided into three groups (one control and two groups of cases, with 25 each). Dosimetry was adopted to evaluate SPL equivalents using a TES-1345 dosimeter. The serum cortisol concentration was measured using a radioimmunoassay (RIA) test in the laboratory. | Exposure levels of 67, 80, and 92 dB. | The results indicated a downward trend in the serum cortisol concentration of the three groups during the night shift. SPL and exposure time significantly affected cortisol concentration. Age and body mass index had no significant influence on the concentration of cortisol. It was concluded that an increase in SPL leads to an increase in serum cortisol concentration. |

Table 1. Cont.

| Year | Studies | Studies Evaluated | | | | |
|------|--------------------------------|---|--|--|---------------------------------------|---|
| | | Number of Participants/Sample | Main Human Health Effects | Methodology | Exposure | Outcomes |
| 2019 | Moradi et al. [52] | 28 (14 females and 14 males) | Stress; noise sensitivity; annoyance | The study was conducted on students at different levels of educational programmes in an acoustic room in the School of Public Health, Iran University of Medical Sciences, in 2016. The study subjects were comprised of 14 female and 14 male university students who met the following entrance criteria: normal sense of hearing (hearing loss less than 20 dB) and no sensitivity to noise. Study of the effects of noise on selective attention of university students. They carried out questionnaires to determine students' personality traits (extroverted or introverted) and analyse their stability or instability. Evaluation of the level of sensitivity to noise, using the Weinstein sensitivity scale, and the level of selective attention, using the DUAF test. | 80 dBA noise at 4000 Hz frequency | Introverted participants are more sensitive to noise than extroverts. The most noise-sensitive participants showed greater stimulation during exposure to noise, which led to increases in incorrect responses and a decrease in mental performance. The participants' personal traits are related to their annoyance due to noise. Stress due to noise improves selective attention in outgoing individuals. |
| 2019 | Alves, Silva and Remoaldo [53] | 200 questionnaires + 62 measurements of noise levels + 14 adapted audiometric tests | Annoyance from LFN; audibility threshold | Analysis of the effects of exposure to low-frequency noise pollution, emitted by poles and power lines, on the well-being of the population, based on a study of “exposed” and “unexposed” individuals in two areas. Conducting audiometric tests adapted to complement the analysis and determine the audibility threshold of the volunteers. Sound level measurement and sound recording (at a distance of 5 m from the source), as well as the adapted audiometric performance test. | Frequency range between 10 and 160 Hz | The “exposed” area has higher sound levels and, consequently, more welfare and health problems than the “unexposed” population. Audiometric tests also revealed that the “exposed” population appears to be less sensitive to low frequencies than the “unexposed” population. |

Van Kamp et al. [40] explored the determinants of annoyance due to tinnitus, that is, low-frequency noise. This article explored the relationship between contextual, situational, and personal characteristics with the level of annoyance due to low-frequency noise, based on secondary analysis of existing data. The results obtained showed significant differences between cities and neighbourhoods, a significant association between background noise levels during the day, and an inverse effect at night. The level of background noise, sensitivity to noise, and dissatisfaction with the residential situation were strongly associated with higher levels of annoyance. Based on the association with nighttime background levels, it was found that the lower the levels, the greater the annoyance due to tinnitus [40].

The main results of the studies by Blair et al. [46] and Pohl, Gabriel, and Hübner [44] have already been described in Section 3.2. Blair et al. (2018) found that the average noise levels during the construction and drilling of an oil and gas well exceeded the levels associated with health annoyance; that is, they were above 50 dBA or 60 dBC [46]. Pohl, Gabriel, and Hübner [44] found that the annoyance experienced was very low and that symptoms of dizziness were not observed in this study.

Ishitake [43] carried out a study regarding annoyance due to wind energy, with a questionnaire carried out for the analysis. In this survey, it was observed that 81% answered that they did not feel annoyed due to the generation of wind energy, while 8% answered that they felt very or a little annoyed [43].

The results related to noise annoyance determined by Moradi et al. [52] and Lee et al. [50] have already been covered in Section 3.3. However, in addition to what was mentioned earlier, Lee et al. [50] concluded that the closest associations between noise exposure and blood pressure were estimated for participants who reported higher classifications of annoyance, irritation, and sensitivity to noise. This indicates that the annoyance from internal noise and sensitivity to noise develop regardless of the level of exposure to external noise. The authors also found that people who were sensitive to noise and participants most irritated due to internal noise had significantly higher SBP and DBP than others [50].

Finally, Hansen et al. [55] determined an audible internal low-frequency tone modulated in amplitude in the frequency of the passage of the blade for 20% of the time up to a distance of 2.4 km. The audible amplitude modelling took place for a similar percentage of time between the wind farm's percentage power capacities of 40% and 85%. The modelling of the audible amplitude in the interior still occurred for 16% of the time at a distance of 3.5 km. At distances of 7.6 and 8.8 km, audible amplitude modelling was only detected on one occasion. During the night, audible amplitude modulation occurred in homes located 3.5 km from the wind farm up to 22% of the time. This had important implications for possible sleep disruptions and annoyance due to the wind farm by audible amplitude modelling, particularly as ambient noise levels in rural South Australia can be as low as 15 and 5 dBA, outdoors and in closed environments, respectively [55]. Although the geometric dimension of the room was not considered in the study by Hansen et al. [55], it is an important variable for this type of study.

3.5. Hearing Loss

Although hearing loss is reported as an effect on human health due to exposure to noise, the studies analysed were not totally conclusive regarding hearing loss due to low-frequency noise.

Selander et al. [58] assessed the impairment of children's hearing when occupational noise exposure occurred during pregnancy. They carried out a prospective cut study and determined cases of hearing impairment in children based on medical records and interviews conducted with prenatal unit teams, in a sample of births between 1986 and 2008 [58]. With the information collected, they established risk models to estimate data related to the impairment of children's hearing when exposed to noise with a strong low-frequency component during pregnancy [58].

Wang et al. [59] evaluated the exposure to noise from traffic and established a comparison regarding the potential risk of hearing loss for residents.

Ohgami, Oshino, Ninomiya, Li, and Kato [60] and Venet et al. [61] addressed experimental studies in rats and the assessment of hearing loss when they are exposed to low-frequency noise.

Ohgami et al. [60] carried out a survey of experimental studies carried out on rats when exposed to low-frequency noise and made an assessment of associated hearing loss. In this review, the imbalance in rats when exposed to noise was also assessed [60]. However, Venet et al. [61] effectively performed experimental tests on rats, testing the hearing of the rats with equipment (cubic DPOAEs – Distortion product otoacoustic emissions) when the animals were exposed to low-frequency noise combined with carbon disulfide (CS₂). The rats' hearing was tested before, during, and after exposure to noise, and blood samples were taken to assess the exposure to CS₂ [61].

Zhou and Fu [62] performed measurements to assess levels of total serum bilirubin, performed tympanometry, and examined pure tone thresholds at low or high frequencies associated with adolescents with different subtypes of sensorineural hearing loss (SNHL), using binary or multinomial logistic regression models.

Regarding the results, Selander et al. [58] divided the sample into three parts: (i) mothers who worked full time, (ii) mothers who worked part-time, and (iii) mothers absent from work during pregnancy. They observed an increased risk of hearing impairment in children after exposure to occupational noise during pregnancy. In the sample considered in the study, they determined adjusted risk rates for 75–84 dBA and ≥ 85 dBA, compared to <75 dBA, of 1.05 and 1.27, respectively. They observed 60, 42, and 14 highly exposed cases for all hearing disorders, sensorineural hearing loss, and tinnitus, respectively. They also determined that the adjusted risk rate for exposure to occupational noise ≥ 85 dBA compared to <75 dBA was 1.82, based on 14 exposed cases and 2222 cases with low exposure. However, the corresponding relative risks (HR) were 1.25 for high exposure among mothers classified as part-time and 0.74 for women who had more than 153 days of absence from work during pregnancy or who were not working at the time of the interview. Finally, [58] found that, among mothers working full-time, high exposure to occupational noise was associated with an increased risk of hearing impairment. The authors also observed an increase in the risk of hearing impairment of the foetus for the case of mothers who worked part-time. On the other hand, [58] did not find an increased risk of hearing impairment in children whose mothers reported exposure to occupational noise in early pregnancy but were absent from work during pregnancy. Thus, the fact that the mother's risk increases with presence at work proves that occupational noise during pregnancy is associated with an increased risk of hearing impairment in children [58].

Wang et al. [59] observed that the mean annual Leq over 24 h in the flow and commercial channel areas was 71.2 ± 1.0 and 70.0 ± 2.6 dBA, respectively, revealing a potential risk of hearing loss among residents [59].

Ohgami et al. [60] determined that a sound stimulus of 375 Hz, a frequency below the audible range of rats, causes a hearing reduction in wild type rats, while in rats with an abnormal otolytic morphology, no hearing loss was observed.

Venet et al. [61] observed that, after the period of contact with noise, exposure due to noise alone caused a hearing reduction in an area of frequency that varied between 3.6 and 6 kHz. The damaged area was approximately one octave (6 kHz) above the highest frequency of the exposure noise (2.8 kHz). Since the maximum auditory sensitivity is located at around 8 kHz in rats, exposure to low-frequency noise can affect the cochlear regions that detect mid-range frequencies. Exposure to CS₂ (250 ppm or more) and noise increased the extent of the damaged frequency window, as a significant reduction in hearing was measured at 9.6 kHz in these conditions, with an increase in CS₂ concentrations [61].

Finally, Zhou and Fu [62] determined that total serum bilirubin levels were associated with any subtype of high-frequency sensorineural hearing loss (SNHL). However, they observed that total serum bilirubin levels were not significantly associated with any low-frequency SNHL (bilateral or unilateral; LPTA greater or lesser) [62].

3.6. Cardiovascular Disease/Heart Rate

Cardiovascular diseases (variations in heart rate) are another effect on human health due to exposure to low-frequency noise.

Walker et al. [63] and Smith et al. [47] used electrocardiograms to measure participants' heart rates when they were exposed to low-frequency noise. In the case of [63], participants were also subjected to blood pressure measurements and saliva samples were collected before, during, and after exposure to noise. Based on linear regression models, the differences between the results obtained before, during, and after the noise were examined [63]. In the case studied by Smith et al. [47], the authors measured participants' heart rates when they were exposed to railway noise.

Poulsen et al. [64] assessed the impact of the risk of myocardial infarction and stroke when there is long-term exposure to noise from wind turbines. Based on hospital and mortality records, they analysed the number of cases of myocardial infarction and stroke in homes located around wind turbines [64].

Wang et al. [59] evaluated the exposure to noise from traffic and established a comparison in relation to the prevention threshold established for cardiovascular diseases.

The methodology adopted by Blair et al. [46] has already been referenced in Section 3.2. According to [46], noise levels above 50 or 60 dBA can cause cardiovascular effects.

Rossi et al. [65] measured the changes in cognitive and physiological parameters—in particular, the response time and heart rate—of participants when exposed to tonal noise (silence or multi-band stochastic noise), low-frequency and low-frequency stochastic noise, and low-frequency stationary noise with regular amplitude modulation.

As for the results, Walker et al. [63] concluded that during exposure to noise, the reductions in heart rate variation (HRV) were 19% with low-frequency power and 9.1% according to the mean square difference between the intervals of adjacent normal heartbeats (RMSSD). On the other hand, during exposure to low-frequency noise, the reductions in HRV were 32% with high-frequency power, 34% with low-frequency power, and 16% according to the standard deviation of the adjacent normal heartbeat intervals (SDNN). Finally, during exposure to low-frequency noise, the reductions in HRV were 21% with low-frequency power, compared to that with exposure to noise. As a general conclusion, [63] determined that exposure to noise—and, in particular, low-frequency noise—negatively affects heart rate variation, which affects health in terms of cardiovascular diseases [63].

Part of the results observed by [47] and [46] have already been described in Section 3.2. Regarding cardiovascular diseases, [47] also observed that the noise spectrum with amplitude frequencies greater than 100 Hz led to increases in heart rate for noise levels equal to or greater than 35 dB and increasing the probability of excitation at a noise level of 45 dB. Meanwhile, [46] concluded that continuous weighted noise above the 50 dBA threshold can cause health effects, such as an increased risk of cardiovascular disease and hypertension [46].

Wang et al. [59] concluded that the average annual equivalent noise levels (Leq, 24 h) were 66.4 ± 4.7 dBA, which exceeded the threshold established for the prevention of cardiovascular diseases.

Rossi et al. [65] concluded that, on average, participants decreased their response times in noise conditions compared to silence conditions; that is, there was evidence of increasing stress, according to the excitation theory. In this study, they observed that participant exposure to low-frequency noise 1 and 2 (LFN1 and LFN2, respectively) produced cognitive stress comparable to stochastic multi-tonal broadband noise (BBN). Subdividing the participants into extroverts and introverts, they demonstrated that LFN1 and LFN2 produced higher stress effects in introverted participants than BBN noise on cognitive performance, but had no effect on extroverts. In addition, heart rates increased significantly in the introverts during the tests, compared to those in a condition of silence before the start of the Stroop effect, while the extroverts showed no changes [65].

Finally, [64] concluded that, for external nighttime noise from long-term-operated wind turbines greater than 42 dBA and low-frequency noise from internal wind turbines greater than 15 dBA, the risks were slightly higher for myocardial infarction than those from exposures less than 24 and 5 dBA, respectively, but the number of cases was low in the groups with the highest exposure. As for strokes, all low-frequency noise levels from internal wind turbines were associated with adjusted incidence rates close to 1.0, while for noise from external wind turbines, the adjusted incidence rates were greater

than 1.0 for the groups of intermediate exposure, and lower than the unit for the groups with greater exposure. High long-term exposure to wind turbine noise was associated with slightly elevated point estimates for myocardial infarction, for both exposure to outdoor wind turbine noise and exposure to potentially more biologically relevant indoor wind turbine noise [64].

4. Conclusions

In the present research, 39 articles addressing exposure to low-frequency noise and its impacts on human health were analysed in depth. The articles were divided into categories according to the emitting source of the noise, and the effects on human health were addressed. Regarding the emitting source, there was a greater number of articles addressing issues related to environmental noise and wind turbine sources.

As for the effects generated on human health, there was a greater number of articles referring to effects on sleep disorders, discomfort, sensitivity to and irritability from noise, annoyance, hearing loss, and cardiovascular diseases, and these effects were analysed in more detail in this article.

In the case of impacts on sleep disturbance, a dependence on the distance to the source of noise was observed; that is, the greater the proximity to the source, the greater the effects on sleep, as established by [41,43]. With long-term noise exposure, noise sensitivity is lower, which reduces the effects on sleep disturbance, as determined by [44]. Exposure to noise at night disturbs sleep and causes more frequent awakenings, less deep and non-continuous sleep, and morning tiredness in the participants, as discussed by [42,47].

With increasing age, especially for people over the age of 65, exposure to noise causes sleep disturbances, which adds to the demand for sleeping pills and antidepressants, as determined by [45].

According to [46], the average noise levels exceeded the levels for sleep disturbances established for human health.

Discomfort, irritability, and sensitivity to noise were among the effects analysed. Discomfort due to noise depends on the proximity of people to the emitting source, making their sensitivity to noise different. Tao et al. [51] proved that with increased distance from the noise source, the noise attenuation rate increases, due to the fact that they feel uncomfortable and disturbed by the low-frequency noise. Alves et al. [53] observed that constant exposure to noise makes people less sensitive to the perception of noise compared to people who are more distant from the emitting source, necessitating greater sound intensity for the perception of low-frequency noise. This sensitivity of people to noise leads to a decrease in their mental performance, as ascertained by [52], and an increase in blood pressure, especially when people are more irritated, as noted by [50]. Huang et al. [48] observed that the convenience of sound does not increase with distance from the ground for buildings of great height, such as skyscrapers, and that exposure to this noise has an impact on the annoyance and discomfort of its residents. However, Suzuki et al. [49] noted that there was a low percentage of people who were uncomfortable with the presence of low-frequency noise compared to the presence of high-frequency noise.

Background noise levels and sensitivity to noise are associated with higher levels of annoyance; that is, they exceed the thresholds established for this health effect, as indicated by [40,46,54]. Moradi et al. [52] also confirms that the level of annoyance when exposed to noise varies with people's personal traits, with greater sensitivity and annoyance in introverts than in extroverts. Exposure to noise from rail transport is associated with the blood pressure of exposed people, which indicates that people with greater sensitivity to noise, greater annoyance, and more irritability have higher blood pressure values than those who do not have these symptoms, as studied by Lee et al. [50]. Thus, the annoyance increases with exposure to noise, especially when people experience unconventional noise. As described by [81], a greater disturbance is observed due to railway noise in people who are not normally exposed to this noise source. Hansen et al. [55] noted that noise levels had implications for annoyance due to exposure to the wind farm. However, both Pohl et al. [44] and Ishitake [43] determined that people do not feel annoyed due to exposure to wind energy noise. New

methodologies for the evaluation of noise emitted by wind turbines could be used to provide new findings in this field [82].

Exposure to noise causes a potential risk of hearing loss in people subjected to it, as studied by Wang et al. [59] and Venet et al. [61]. Venet et al. [61] also determined that exposure to carbon disulfide (CS₂) and noise caused a reduction in the auditory level when an increase in CS₂ concentrations was observed. Exposure to occupational noise during pregnancy was also a topic studied by Selander et al. [58] who proved that exposure to this type of noise is associated with the risk of increased hearing impairment in children, with greater relevance in mothers who worked full-time and part-time during pregnancy. Through experiments on rats, Ohgami et al. [60] observed a hearing reduction in wild type rats, in contrast to in rats with an abnormal autolytic morphology in which this hearing loss was not observed. However, studies were observed in which no effects associated with hearing loss were found with exposure to low-frequency noise, as ascertained by Zhou and Fu [62]. All studies analysed in this domain regarded low and high frequencies, revealing hearing loss in the samples exposed to high frequencies. Hearing loss due to low-frequency noise was not totally observed.

Finally, it was observed that exposure to noise—in particular, low-frequency noise—negatively affects the variation in heart rate, which harms health in terms of cardiovascular diseases, as it exceeds the levels established for the prevention of these diseases, as discussed by Walker et al. [63], Wang et al. [59], and Blair et al. [46]. According to Rossi et al. [65], heart rate increases significantly in introverts compared to in a situation of silence, while extroverts show no change in their heart rate. Smith et al. [47] realized that the heart rate in people increased with greater exposure to noise. High long-term exposure to noise from wind turbines is associated with an increase in myocardial infarction and stroke, as studied by Poulsen et al. [64].

The literature review carried out constitutes a novelty in Portugal, whether in the social sciences or the more exact ones, such as environmental acoustics. It is expected that in future studies, this type of evaluation can be explored for a longer period and more sources of low-frequency noise emission. This may provide important data on low-frequency exposure and its effects on human health, as well as important information on the definition of limits for installing wind farms and other sources of low-frequency noise. While some type of impacts on health have not yet been analysed and continue to be an understudied field, the impacts studied can provide good advice for the planning field. Thus, these studies can point out good ways of minimising the influence on human beings and can constitute a good tool for the preventive dimension of planning.

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References

1. Berglund, B.; Hassmén, P.; Job, R.F. Sources and effects of low-frequency noise. *J. Acoust. Soc. Am.* **1996**, *99*, 2985–3002. [CrossRef]
2. Pawlaczyk-Łuszczynska, M.; Dudarewicz, A.; Szymczak, W.; Sliwinska-Kowalska, M. Evaluation of annoyance from low frequency noise under laboratory conditions. *Noise Health* **2010**, *12*, 166–181. [CrossRef]
3. Alves, J.A.; Silva, L.T.; Remoaldo, P.C. Impacts of low frequency noise exposure on well-being: A case-study from Portugal. *Noise Health* **2018**, *20*, 131–145.

4. Dart, E.E. Effects of high speed vibrating tools on operators engaged in airplane industry. *Occup. Med.* **1946**, *1*, 515–550.
5. Rumancev, G.I. Investigations concerning the hygienic evaluation of vibration in factories producing reinforced concrete. *Gig. Tr. Prof. Zabol* **1961**, *5*, 6–12.
6. Cohen, A. The influence of a company hearing conservation program on extra-auditory problems in workers. *J. Saf. Res.* **1976**, *8*, 146–162.
7. Obata, J.; Morita, S.; Hirose, K.I.; Matsumoto, H. The effects of noise upon human efficiency. *J. Acoust. Soc. Am.* **1934**, *5*, 255–261. [[CrossRef](#)]
8. Vasudevan, R.; Leventhall, H.G. Annoyance due to environmental low frequency noise and source location—A case study. *J. Low Freq. Noise Vib.* **1989**, *8*, 30–39. [[CrossRef](#)]
9. Davis, A.C.; Lovell, E.A.; Smith, P.A.; Ferguson, M.A. The contribution of social noise to tinnitus in young people - a preliminary report. *Noise Health* **1998**, *1*, 40–46.
10. Mirowska, M. An Investigation and Assessment of Annoyance of Low Frequency Noise in Dwellings. *J. Low Freq. Noise Vib.* **1998**, *17*, 119–126. [[CrossRef](#)]
11. Rushforth, I.; Moorhouse, A.; Styles, P. A case study of low frequency noise assessed using DIN 45680 Criteria. *J. Low Freq. Noise, Vib. Act. Control* **2002**, *21*, 181–198. [[CrossRef](#)]
12. Babisch, W.; Ising, H.; Gallacher, J.E.J.; Elwood, P.C. Traffic noise and cardiovascular risk: The Caerphilly study, first phase. Outdoor noise levels and risk factors. *Arch. Environ. Health* **1988**, *43*, 407–414. [[CrossRef](#)] [[PubMed](#)]
13. Bluhm, G.; Eriksson, C. Cardiovascular effects of environmental noise: Research in Sweden. *Noise Health* **2011**, *13*, 212–216. [[CrossRef](#)] [[PubMed](#)]
14. Lundquist, P.; Holmberg, K.; Landstrom, U. Annoyance and effects on work from environmental noise at school. *Noise Health* **2000**, *2*, 9–46.
15. Mirowska, M. Evaluation of low frequency noise in dwellings. New Polish recommendations. *J. Of Low Freq. Noise Vib.* **2001**, *20*, 67–74. [[CrossRef](#)]
16. Griefahn, B. Sleep disturbances related to environmental noise. *Noise Health* **2002**, *4*, 57–60.
17. Rios, A.L.; Silva, G.A. Sleep quality in noise exposed Brazilian workers. *Noise Health* **2005**, *7*, 1–6.
18. Murphy, E.; King, E.A. Scenario analysis and noise action planning: Modelling the impact of mitigation measures on population exposure. *Appl. Acoust.* **2011**, *72*, 487–494. [[CrossRef](#)]
19. Schultz, T.J. Synthesis of social surveys on noise annoyance. *J. Acoust. Soc. Am.* **1978**, *64*, 377–405. [[CrossRef](#)]
20. Paulsen, R.; Kastka, J. Effects of combined noise and vibration on annoyance. *J. Sound Vib.* **1995**, *181*, 295–314. [[CrossRef](#)]
21. Karpova, N.I.; Alekseev, S.V.; Erokhin, V.N.; Kadyskina, E.N.; Reutov, O.V. Early response of the organism to low-frequency acoustical oscillations. *Noise Vib. Bull.* **1970**, *11*, 100–103.
22. Silva, L.T.; Mendes, B.; Rodrigues, D.S.; Ribeiro, P.J.G.; Mendes, J.F.G. A Mobile Environmental Monitoring Station For Sustainable Cities. *Int. J. Sustain. Dev. Plan.* **2016**, *11*, 949–958. [[CrossRef](#)]
23. Miedema, H.M.E.; Vos, H. Exposure-response relationships for transportation noise. *J. Acoust. Soc. Am.* **1998**, *104*, 3432–3445. [[CrossRef](#)]
24. Babisch, W. Traffic noise and cardiovascular disease: Epidemiological review and synthesis. *Noise Health* **2000**, *2*, 9–32. [[PubMed](#)]
25. Passchier-Vermeer, W.; Passchier, W.F. Noise Exposure and Public Health. *Environ. Health Perspect.* **2000**, *108*, 123–131. [[PubMed](#)]
26. Ising, H.; Kruppa, B. Health effects caused by noise: Evidence in the literature from the past 25 years. *Noise Health* **2004**, *6*, 5–13.
27. Bluhm, G.; Berglind, N.; Nordling, E.; Rosenlund, M. Road traffic noise and hypertension. *Occup. Environ. Med.* **2007**, *64*, 122–126. [[CrossRef](#)] [[PubMed](#)]
28. Cavacas, M.A.; Tavares, V.; Oliveira, M.J.; Oliveira, P.; Sezinando, A.; Santos, J.M. Effects of industrial noise on circumpulpal dentin—A field emission scanning electron microscopy and energy dispersive spectroscopy analysis. *Int. J. Clin. Exp. Pathol.* **2013**, *6*, 2697–2702.
29. Cavacas, M.A.; Tavares, V.; Borrecho, G.; Oliveira, M.J.; Oliveira, P.; Águas, A.; Santos, J.M. Industrial Noise and Tooth Wear – Experimental Study. *Int. J. Med. Sci.* **2015**, *12*, 3–8. [[CrossRef](#)]
30. Waye, K.P.; Bengtsson, J.; Kjellberg, A.; Benton, S. Low frequency noise “pollution” interferes with performance. *Noise Health* **2001**, *4*, 33–49.

31. Waye, K.P. On the Effects of Environmental Low Frequency Noise. Ph.D. Thesis, Goteborgs University, Gothenburg, Sweden, 1995.
32. Pawlaczek-Luszczynska, M.; Szymczak, W.; Dudarewicz, A.; Sliwińska-Kowalska, M. Proposed criteria for assessing low frequency noise annoyance in occupational settings. *Int. J. Occup. Med. Environ. Health* **2006**, *19*, 185–197. [\[CrossRef\]](#)
33. Leventhall, H.G. Low frequency noise and annoyance. *Noise Health* **2004**, *6*, 59–72.
34. Alves, J.A.; Silva, L.T.; Remoaldo, P.C. The influence of Low-frequency noise pollution on the quality of life and place in sustainable cities: A case study from Northern Portugal. *Sustainability* **2015**, *7*, 13920–13946. [\[CrossRef\]](#)
35. World Health Organization. *Environmental Noise Guidelines for the European Region*; WHO Regional Office for Europe: Copenhagen, Denmark, 2018.
36. Laird, D.A. Experiments on the physiological cost of noise. *J. Natl. Inst. Ind. Psychol.* **1928**, *4*, 251–258.
37. Vasudevan, R.N.; Gordon, C.G. Experimental study of annoyance due to low frequency environmental noise. *Appl. Acoust.* **1977**, *10*, 57–69. [\[CrossRef\]](#)
38. Castelo Branco, N.A.A. A unique case of vibroacoustic disease. A tribute to an extraordinary patient. *Aviat Space Env. Med.* **1999**, *70*, A27–A31.
39. Moorhouse, A.; Waddington, D.; Adams, M. *Proposed Criteria for the Assessment of Low Frequency Noise Disturbance*; DEFRA: University of Salford: Salford, UK, 2005.
40. Van Kamp, I.; Breugelmans, O.; Van Poll, R.; Baliatsas, C.; Van Kempen, E. Determinants of annoyance from humming sound as indicator of low frequency noise. In Proceedings of ACOUSTICS 2017 Perth: Sound, Science and Society—2017 Annual Conference of the Australian Acoustical Society AAS, Perth, Australia, 19–22 November 2017; pp. 1–7.
41. Abbasi, M.; Monazzam, M.R.; Zakerian, S.A.; Ebrahimi, M.H.; Dehghan, S.F.; Akbarzadeh, A. Assessment of noise effects of wind turbine on the general health of staff at wind farm of Manjil, Iran. *J. Low Freq. Noise Vib. Act. Control.* **2016**, *35*, 91–98. [\[CrossRef\]](#)
42. Morsing, J.A.; Smith, M.G.; Ögren, M.; Thorsson, P.; Pedersen, E.; Forssén, J.; Waye, K.P. Wind turbine noise and sleep: Pilot studies on the influence of noise characteristics. *Int. J. Environ. Res. Public Health* **2018**, *15*.
43. Ishitake, T. Wind Turbine Noise and Health Effects. *Nihon Eiseigaku Zasshi* **2018**, *73*, 298–304. [\[CrossRef\]](#)
44. Pohl, J.; Gabriel, J.; Hübner, G. Understanding stress effects of wind turbine noise—The integrated approach. *Energy Policy* **2018**, *112*, 119–128. [\[CrossRef\]](#)
45. Poulsen, A.H.; Raaschou-Nielsen, O.; Peña, A.; Hahmann, A.N.; Nordsborg, R.B.; Ketzel, M.; Brandt, J.; Sørensen, M. Impact of Long-Term Exposure to Wind Turbine Noise on Redemption of Sleep Medication and Antidepressants: A Nationwide Cohort Study. *Environ. Heal. Perspect.* **2019**, *127*, 37005. [\[CrossRef\]](#) [\[PubMed\]](#)
46. Blair, B.D.; Brindley, S.; Dinkeloo, E.; McKenzie, L.M.; Adgate, J.L. Residential noise from nearby oil and gas well construction and drilling. *J. Expo. Sci. Environ. Epidemiol.* **2018**, *28*, 538–547. [\[CrossRef\]](#)
47. Smith, M.G.; Ögren, M.; Ageborg Morsing, J.; Persson Waye, K. Effects of ground-borne noise from railway tunnels on sleep: A polysomnographic study. *Build. Environ.* **2019**, *149*, 288–296. [\[CrossRef\]](#)
48. Huang, B.; Pan, Z.; Liu, Z.; Hou, G.; Yang, H. Acoustic amenity analysis for high-rise building along urban expressway: Modeling traffic noise vertical propagation using neural networks. *Transp. Res. Part. D Transp. Environ.* **2017**, *53*, 63–77. [\[CrossRef\]](#)
49. Suzuki, F.A.B.; Suzuki, F.A.; Onishi, E.T.; Penido, N.O. Psychoacoustic classification of persistent tinnitus. *Braz. J. Otorhinolaryngol.* **2018**, *84*, 583–590. [\[CrossRef\]](#)
50. Lee, P.J.; Park, S.H.; Jeong, J.H.; Choung, T.; Kim, K.Y. Association between transportation noise and blood pressure in adults living in multi-storey residential buildings. *Environ. Int.* **2019**, *132*, 105101. [\[CrossRef\]](#) [\[PubMed\]](#)
51. Tao, Z.; Wang, Y.; Zou, C.; Li, Q.; Luo, Y. Assessment of ventilation noise impact from metro depot with over-track platform structure on workers and nearby inhabitants. *Environ. Sci. Pollut. Res.* **2019**, *26*, 9203–9218. [\[CrossRef\]](#)
52. Moradi, G.; Omid, L.; Vosoughi, S.; Ebrahimi, H.; Alizadeh, A.; Alimohammadi, I. Effects of noise on selective attention: The role of introversion and extraversion. *Appl. Acoust.* **2019**, *146*, 213–217. [\[CrossRef\]](#)
53. Alves, J.; Silva, L.T.; Remoaldo, P. How Can Low-Frequency Noise Exposure Interact with the Well-Being of a Population? Some Results from a Portuguese Municipality. *Appl. Sci.* **2019**, *9*, 5566. [\[CrossRef\]](#)

54. Boyle, M.D.; Soneja, S.I.; Quirós-Alcalá, L.; Dalemarré, L.; Sapkota, A.R.; Sangaramoorthy, T.; Wilson, S.; Milton, D.; Sapkota, A. A pilot study to assess residential noise exposure near natural gas compressor stations. *PLoS ONE* **2017**, *12*, e0174310. [\[CrossRef\]](#)
55. Hansen, K.L.; Nguyen, P.; Zajamšek, B.; Catcheside, P.; Hansen, C.H. Prevalence of wind farm amplitude modulation at long-range residential locations. *J. Sound Vib.* **2019**, *455*, 136–149. [\[CrossRef\]](#)
56. Berglund, B.; Lindvall, T.; Schwela, D.H. *Guidelines for Community Noise*; World Health Organization: Geneva, Switzerland, 1999.
57. Hurlley, C. (Ed.) *Night Noise Guidelines for Europe*; WHO Regional Office Europe: Copenhagen, Denmark, 2009.
58. Selander, J.; Albin, M.; Rosenhall, U.; Rylander, L.; Lewné, M.; Gustavsson, P. Maternal occupational exposure to noise during pregnancy and hearing dysfunction in children: A nationwide prospective cohort study in Sweden. *Environ. Health Perspect.* **2016**, *124*, 855–860. [\[CrossRef\]](#)
59. Wang, V.-S.; Lo, E.-W.; Liang, C.-H.; Chao, K.-P.; Bao, B.-Y.; Chang, T.-Y. Temporal and spatial variations in road traffic noise for different frequency components in metropolitan Taichung, Taiwan. *Environ. Pollut.* **2016**, *219*, 174–181. [\[CrossRef\]](#) [\[PubMed\]](#)
60. Ohgami, N.; Oshino, R.; Ninomiya, H.; Li, X.; Kato, M. Impairments of Inner Ears Caused by Physical Environmental Stresses. *Nihon Eiseigaku Zasshi. Jpn. J. Hyg.* **2017**, *72*, 38–42. [\[CrossRef\]](#) [\[PubMed\]](#)
61. Venet, T.; Carreres-Pons, M.; Chalansonnet, M.; Thomas, A.; Merlen, L.; Nunge, H.; Bonfanti, E.; Cosnier, F.; Llorens, J.; Campo, P. Continuous exposure to low-frequency noise and carbon disulfide: Combined effects on hearing. *NeuroToxicology* **2017**, *62*, 151–161. [\[CrossRef\]](#) [\[PubMed\]](#)
62. Zhou, G.; Fu, W. Total serum bilirubin levels and sensorineural hearing loss in the US adolescents: NHANES 2007–2010. *Int. J. Pediatric Otorhinolaryngol.* **2018**, *105*, 20–26. [\[CrossRef\]](#) [\[PubMed\]](#)
63. Walker, E.D.; Brammer, A.; Cherniack, M.G.; Laden, F.; Cavallari, J.M. Cardiovascular and stress responses to short-term noise exposures—A panel study in healthy males. *Environ. Res.* **2016**, *150*, 391–397. [\[CrossRef\]](#) [\[PubMed\]](#)
64. Poulsen, A.H.; Raaschou-Nielsen, O.; Peña, A.; Hahmann, A.N.; Nordsborg, R.B.; Ketzel, M.; Brandt, J.; Sørensen, M. Long-Term Exposure to Wind Turbine Noise and Risk for Myocardial Infarction and Stroke: A Nationwide Cohort Study. *Environ. Heal. Perspect.* **2019**, *2019*, 37004. [\[CrossRef\]](#)
65. Rossi, L.; Prato, A.; Lesina, L.; Schiavi, A. Effects of low-frequency noise on human cognitive performances in laboratory. *Build. Acoust.* **2018**, *25*, 17–33. [\[CrossRef\]](#)
66. Zeitooni, M.; Mäki-Torkko, E.; Stenfelt, S. Binaural Hearing Ability with Bilateral Bone Conduction Stimulation in Subjects with Normal Hearing: Implications for Bone Conduction Hearing Aids. *Ear Hear.* **2016**, *37*, 690–702. [\[CrossRef\]](#)
67. Liu, C.S.; Young, L.H.; Yu, T.Y.; Bao, B.Y.; Chang, T.Y. Occupational noise frequencies and the incidence of hypertension in a retrospective cohort study. *Am. J. Epidemiol.* **2016**, *184*, 120–128. [\[CrossRef\]](#) [\[PubMed\]](#)
68. Vasilyeva, I.N.; Bepalov, V.G.; Semenov, A.L.; Baranenko, D.A.; Zinkin, V.N. The Effects of Low-Frequency Noise on Rats: Evidence of Chromosomal Aberrations in the Bone Marrow Cells and the Release of Low-Molecular-Weight DNA in the Blood Plasma. *Noise Health* **2017**, *19*, 79–83. [\[PubMed\]](#)
69. Alimohammadi, I.; Ebrahimi, H. Comparison between effects of low and high frequency noise on mental performance. *Appl. Acoust.* **2017**, *126*, 131–135. [\[CrossRef\]](#)
70. Mancera, K.F.; Lisle, A.; Allavena, R.; Phillips, C.J.C. The effects of mining machinery noise of different frequencies on the behaviour, faecal corticosterone and tissue morphology of wild mice (*Mus musculus*). *Appl. Anim. Behav. Sci.* **2017**, *197*, 81–89. [\[CrossRef\]](#)
71. Abbasi, A.M.; Motamedzade, M.; Aliabadi, M.; Golmohammadi, R.; Tapak, L. Study of the physiological and mental health effects caused by exposure to low-frequency noise in a simulated control room. *Build. Acoust.* **2018**, *25*, 233–248. [\[CrossRef\]](#)
72. Ninomiya, H.; Ohgami, N.; Oshino, R.; Kato, M.; Ohgami, K.; Li, X.; Kato, M. Increased expression level of Hsp70 in the inner ears of mice by exposure to low frequency noise. *Hear. Res.* **2018**, *363*, 49–54. [\[CrossRef\]](#)
73. Chalansonnet, M.; Carreres-Pons, M.; Venet, T.; Thomas, A.; Merlen, L.; Seidel, C.; Cosnier, F.; Nunge, H.; Pouyatos, B.; Llorens, J.; et al. Combined exposure to carbon disulfide and low-frequency noise reversibly affects vestibular function. *NeuroToxicology* **2018**, *67*, 270–278. [\[CrossRef\]](#)
74. Min, J.Y.; Min, K. Cumulative exposure to nighttime environmental noise and the incidence of peptic ulcer. *Environ. Int.* **2018**, *121*, 1172–1178. [\[CrossRef\]](#)

75. Wang, X.; Lai, Y.; Zhang, X.; Zhao, J. Effect of low-frequency but high-intensity noise exposure on swine brain blood barrier permeability and its mechanism of injury. *Neuroscience Letters* **2018**, *662*, 122–128. [[CrossRef](#)]
76. Paunović, K.; Jakovljević, B.; Stojanov, V. The timeline of blood pressure changes and hemodynamic responses during an experimental noise exposure. *Environ. Res.* **2018**, *163*, 249–262. [[CrossRef](#)]
77. Negishi-Oshino, R.; Ohgami, N.; He, T.; Li, X.; Kato, M.; Kobayashi, M.; Gu, Y.; Komuro, K.; Angelidis, C.E.; Kato, M. Heat shock protein 70 is a key molecule to rescue imbalance caused by low-frequency noise. *Arch. Toxicol.* **2019**, *93*, 3219–3228. [[CrossRef](#)] [[PubMed](#)]
78. Scherer, R.W.; Formby, C. Effect of Tinnitus Retraining Therapy vs Standard of Care on Tinnitus-Related Quality of Life: A Randomized Clinical Trial. *Jama Otolaryngol. Head Neck Surg.* **2019**, *145*, 597–608. [[PubMed](#)]
79. Phadke, K.V.; Abo-Hasseba, A.; Švec, J.G.; Geneid, A. Influence of Noise Resulting From the Location and Conditions of Classrooms and Schools in Upper Egypt on Teachers' Voices. *J. Voice* **2019**, *33*, 802.e1–802.e9. [[CrossRef](#)] [[PubMed](#)]
80. Zare, S.; Baneshi, M.R.; Hemmatjo, R.; Ahmadi, S.; Omidvar, M.; Dehaghi, B.F. The Effect of Occupational Noise Exposure on Serum Cortisol Concentration of Night-shift Industrial Workers: A Field Study. *Saf. Health Work* **2019**, *10*, 109–113. [[CrossRef](#)] [[PubMed](#)]
81. Licitra, G.; Fredianelli, L.; Petri, D.; Vigotti, M.A. Annoyance evaluation due to overall railway noise and vibration in Pisa urban areas. *Sci. Total Environ.* **2016**, *568*, 1315–1325. [[CrossRef](#)] [[PubMed](#)]
82. Iannace, G.; Ciaburro, G.; Trematerra, A. Wind Turbine Noise Prediction Using Random Forest Regression. *Machines* **2019**, *7*, 69. [[CrossRef](#)]



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Ronald & Debra Brown

201 Sagebrush Rd
Yukon, OK 73099
405-778-0800

RECEIVED

By The City of Oklahoma City Office of the City Clerk at 12:20 pm, Apr 03, 2024

March 21, 2024
Barbara Peck ward 3, or whom it may concern
200 N Walker Ave
OKC, OK 73102

Dear Barbara,

I Ronald Brown & Debra Brown herby Protest PUD-1983 application by Mustang Creek Crossing, LLC to rezone 810 South John Kilpatrick Turnpike.

My main concern is the safety of the children attending the two schools, Mustang North Middle School and Mustang Creek Elementary. The back of the stage is less than 300 feet from school property. The applicants have not attached the actual blueprints for the Oklahoma City project and we are not able to see what kind of fencing will be used. They have stated no less than 6' and no greater than 8' but will it be secure enough? And how will it help mitigate sound?

Kids by nature are very curious and may be able to sneak into the venue grounds.

Many children also walk home from the middle school and we are concerned about the band crew from out of state that has not been vetted by the venue. They will also be walking by ticket scalpers and patrons waiting to get into the venue. These are very dangerous possibilities for the kids and I ask you to help protect them from future harm.

We are the property owners of 201 Sagebrush Rd and ask you to deny the rezoning of this application.

Sincerely yours,



Ronald & Debra Brown

RECEIVED

By The City of Oklahoma City Office of the City Clerk at 2:45 pm, Apr 02, 2024

From: Cindy Burns <cjburnsie@att.net>

Sent: Tuesday, April 2, 2024 12:37 PM

To: City Clerk Email <CityClerk@okc.gov>; Ward3 <ward3@okc.gov>; The Mayor <mayor@okc.gov>

Cc: Cindy Burns <cjburnsie@att.net>

Subject: Protest PUD-1983

You don't often get email from cjburnsie@att.net. [Learn why this is important](#)

WARNING: The sender of this email could not be validated and may not match the person in the "From" field..

My name is Cynthia Burns and I am protesting the rezoning for PUD-1983 by Mustang Creek Crossing, LLC, 810 S John Kilpatrick Turnpike.

I reside at 10016 Thompson Ave in the Westbury South addition between Sarah Rd and Morgan Road and SW 15th and SW 29th Streets.

I live on what was formerly the Westbury Golf Course which was sold and now my view has radically changed. I paid premium because I was on a golf course. Now, I see houses.

I am totally opposed to the proposed Sunset Amphitheater currently being discussed. I have hearing issues and the noise levels and vibrations are going to impact me as well as everyone in this community.

There are currently close to 4,000 homes in this area as well as a middle school and elementary school.

Placing a venue like this in an area like this is unfathomable. The noise, traffic, trash will heavily impact our neighborhood. I have security concerns as well. Will they practice when our kids are still in class?

We try not to go out at rush hour or school pickup times because the traffic is horrible. I cannot imagine how this venue will help anyone at all.

Building something like this is great for people driving from miles away. Will they leave the property however they choose?

Please, I implore you to vote NO on April 9th and always to this type of intrusion. Please consider placing this in an open area.

Thank you for your time.

Cynthia Burns
Cjburnsie@att.net
10016 Thompson Ave
Yukon, OK 73099
Sent from my iPhone

RECEIVED

By The City of Oklahoma City Office of the City Clerk at 2:45 pm, Apr 02, 2024

From: Calli Hamar <callihamar@hotmail.com>

Sent: Tuesday, April 2, 2024 1:35 PM

To: citycler@okc.gov; The Mayor <mayor@okc.gov>; Ward3 <ward3@okc.gov>

Subject: Protest PUD - 1983, Sunset Amphitheater

Some people who received this message don't often get email from callihamar@hotmail.com. [Learn why this is important](#)

I protest PUD - 1983 application by Mustang Creek Crossings, LLC to rezone 810 South John Kilpatrick Turnpike. The following are just a few points I'd like to make:

1. As a homeowner in the neighboring neighborhood, Westbury North, I have great concern on the noise pollution that this Ampitheater will cause. Our neighborhood it quiet and quant with many families. The stress, of the loud music and events that are planned to be at the Amphitheater, is of great concern for those who have PTSD, Special needs, have children that have early nighttime sleep schedules. We need our city council to protect its residents that they are supposed to be representing.
2. The distraction of the screen that will be used at the events will cause on Turnpike and I-40 drivers!

I have been the homeowner of 10116 Banff Way Yukon, Ok for 11 years this month (April) and ask you to deny the rezoning of this PUD, please!

Sincerely,

Calli Hamar
10116 Banff Way
Yukon, Ok 73099
405-248-0071

RECEIVED

By The City of Oklahoma City Office of the City Clerk at 5:04 pm, Apr 03, 2024

From: Donna Gregory <dgregory11@gmail.com>

Sent: Wednesday, April 3, 2024 4:27 PM

To: City Clerk Email <CityClerk@okc.gov>

Subject: Protest PUD-1983, Sunset Amp

You don't often get email from dgregory11@gmail.com. [Learn why this is important](#)

Greetings,

I, Donna Gregory, hereby protest PUD-1983 application by Mustang Creek Crossings, LLC to rezone 810 South John Kilpatrick Turnpike. I live at 11308 SW 5th Street, Apt 6315, Yukon, OK, 73099. I have been a resident at this address for nearly 6 years.

I am deeply distressed at the thought of a 12,000+ seat outdoor amphitheater being built approximately 1.6 miles from my home. I've lived in northwest Oklahoma City my entire adult life, but I moved to west Oklahoma City to be near aging family members 6 years ago. Rezoning this property to build an outdoor amphitheater would not only impact the quality of my life due to the noise levels coming from an outdoor amphitheater, but also it would impact the lives of the elderly family members I assist. One of them lives only 2 miles from the proposed site.

I gave planetarium shows at the old Omniplex (now Science Museum Oklahoma) as a volunteer lecturer for 8 years. I am very familiar with the experience of sound in domed theaters and half domes (as with the now closed OmniDome at the former Omniplex). Without getting into lengthy specifics in this email, **please know there is no noise abatement that will reduce the impact live outdoor music concerts of any kind will have**, particularly with a semi-domed theater. (I'm happy to share these specifics if you'd like more information.)

But beyond the noise, I'm also extremely worried how the increased traffic in what is basically a semi-rural area will impact emergency services. Will our families in this area, including me and one of my elderly family members, have issues with response times or, worst case, even access for ambulances, fire, and police services to reach residents of the area on concert nights?

We've all been in concert traffic. We know this is a significant likelihood. Even beyond the noise issue, which is a serious and prominent concern, the thought of a loved one dying or being compromised due to concert traffic in a heavy residential area is nightmare-inducing. **There is no business that's worth the risk of potentially costing hundreds or thousands of Oklahoma City citizens their lives or homes.** One cigarette butt thrown on the ground on a hot, dry Oklahoma night could result in a major disaster in these neighborhoods.

Additionally, there are a lot of problems with the application found in PUD-1983 that I urge our City Council members to please consider, including the changes to City Code that will

have to happen due to the noise levels, curfews, the proposed parking lots with tree islands, and the size of the EMD3 screen (twice the allowable size in current city code). Plus the 200 square foot LED sign that will be pointed at the Turnpike. And I'm very concerned there's no requirement for the amphitheater to have a noise permit, thus eliminating any accountability for the noise level.

I'm also concerned that when I went to the Notes Live website for the Oklahoma City amphitheater at <https://noteslive.vip/properties/okcsunset/>, the video didn't talk about Oklahoma City, but rather Broken Arrow. It's nothing but a sales pitch for investors. That's unsettling and makes me feel as if Notes Live isn't being as professional as it should be for a project impacting thousands of people and their homes. And I also can't help but wonder about the disturbing lack of transparency about the OKC project on their website.

I also want to mention one more thing. I read an editorial in the Mustang Times from the person who is selling the land to Notes Live. It was written in that editorial that the amphitheater would be used Thursday - Saturday from spring to October. That's 3 days a week from March - October, which is 8 months out of the year. To look at this statistically, **for 61.5% of the year, each week we could potentially have live music blaring into our homes 3 days a week, disturbing our peace, up to 11:00 pm.** Plus the noise of the concert traffic after the shows are over. Honking, revving engines. As I said, we've all been in concert traffic so we know what it's like.

I'm sure my story is just one of hundreds, if not thousands, of people who live in this area. **The bottom line reality regarding PUD-1983 is thousands of Oklahoma City residents' lives will be negatively impacted on multiple levels if this property is rezoned.** For these reasons, and more, **I urgently and with deep heartfelt concern and conviction ask all members of the City Council of Oklahoma City to please deny the rezoning of the PUD-1983 application.**

Thank you for your consideration.

Respectfully,
Donna Gregory
11308 SW 5th Street, Apt 6315
Yukon, OK 73099
Phone: 405-206-6170

RECEIVED

By The City of Oklahoma City Office of the City Clerk at 5:04 pm, Apr 03, 2024

From: C Scott <read2me4now@yahoo.com>
Sent: Wednesday, April 3, 2024 4:03 PM
To: City Clerk Email <CityClerk@okc.gov>
Subject: Protest PUD-1983, Sunset Amphitheater

You don't often get email from read2me4now@yahoo.com. [Learn why this is important](#)

I am writing to protest PUD-1983 application by Mustang Creek Crossings, LLC to rezone 810 South John Kilpatrick Turnpike.

I have great concerns about a venue of this type and magnitude being placed in the midst of our residential neighborhoods (both long established ones and those currently in development). I am also seriously opposed to its location abutting two public schools in our community.

- Quality of life in the many surrounding neighborhoods will be downgraded by the noise of such a large outdoor facility with so many events ongoing, plus the extended noise timeframes, the decibel level increased beyond city ordinance while lacking specifications for effective enforcement, and by the late-night noise of the heavy traffic burden added to local streets.

- I am very concerned about the concentration of traffic created by rides for 12,500 seats plus employees plus performers vehicles being added to our neighborhood, much of it at the very time our streets are already busy with school and home-from-work traffic. Even IF the remainder of Sara Road is made four lanes, all area thoroughfares will experience backups due to traffic volume. This basically residential area is totally lacking in infrastructure to handle such a bulk of traffic. If my house is on fire, how will the fire trucks get through the gridlock in time to save my home? How will the ambulance get to families in the neighborhood when emergencies occur? The feeling of safety and assistance we value here is destroyed.

- With my long background in education, the reality of placing this amphitheater directly against neighborhood schools is shocking. The permission for sound checks begins well before the end of the instructional day. Trying to learn at the end of a long day does Not need the additional distraction of the racket created by "sound checks". Schools do not close at the end of the instructional time. Many types of work, activities and events are a continuing part of staff responsibilities and the students' success and development. Activities, events, competitions, and sports occur during evenings and weekends as an important part of the school and our community. Let's support and reinforce these positive opportunities, not deter them.

I am concerned that the issues mentioned along with other foreseeable problems and situations resulting from placing this facility at the location being requested would degrade the community and lower the property values on the homes we have worked hard to purchase, improve, and maintain. I am the homeowner at 10234 Bonnycastle Drive, Yukon OK 73099. I request you deny the rezoning, PUD-1983.

Sincerely,
Carol Scott

From: Cynthia Ivy <ivycynann@gmail.com>
Sent: Wednesday, April 3, 2024 4:00 PM
To: City Clerk Email <CityClerk@okc.gov>
Subject: Protest PUD 1983

RECEIVED

By The City of Oklahoma City Office of the City Clerk at 5:04 pm, Apr 03, 2024

You don't often get email from ivycynann@gmail.com. [Learn why this is important](#)

I, Cynthia Ivy, at 10412 Hollyhead Way, Yukon, OK, hereby protest the PUD 1983.

The reasons for my protest are:

- 1.) Our infrastructure cannot support or handle this enormous undertaking. The roads are not equipped to handle all the traffic that it will bring to our community. Right now we have 2 lane roads. The 4 lane road from Morgan Rd. to Sara Rd., S.W. 15th St., is in need of repair. With all the housing that is being built in and around this area, the traffic will increase. It is hard to get out on S.W. 15 now as it is, much less any other roads we will travel with the increased traffic. Fire and emergency vehicles trying to get to and from our area will become an issue.
- 2.) This project backs up directly North of our two schools which is a part of Mustang Public Schools. Simply put. I just do not understand the reasoning behind this. Out of all places to build, you would think a project like this would require more land and not be squeezed into an area that would affect our school's daytime traffic, daytime recess, daytime and nighttime school activities.
- 3.) And most importantly why I protest this project the most is the monastery of it all. From the noise, to the vibration, to the traffic, to the parking, to the effect it will have on our neighborhoods, to our schools, to our veterans with PTSD, and to all the residents who are trying to live their lives and raise their families.

The number of reasons could go on and on. Please try to put yourselves in our position. Please ask yourselves the question, would I like something like this in my backyard?

Thank you for taking the time to read my protest letter and please VOTE NO on PUD 1983. It is for our future.

Sincerely,
Cynthia Ivy

RECEIVED

By The City of Oklahoma City Office of the City Clerk at 5:04 pm, Apr 03, 2024

From: Taylor Bales <taylornelms23@yahoo.com>
Sent: Wednesday, April 3, 2024 3:30 PM
To: City Clerk Email <CityClerk@okc.gov>
Subject: Protest PUD- 1983

You don't often get email from taylornelms23@yahoo.com. [Learn why this is important](#)

To Whom it May Concern,

My name is Taylor Nelms. I live at 11017 NW 20th St, Yukon, OK 73099 (OKC Limits). I'm 100% AGAINST PUD-1983. Frankly, myself and numerous other residents don't want an amphitheater near our homes for various reasons, including: noise levels past what city ordinance allows, heavier traffic, road noise, wrecks, etc. How will traffic control work? There aren't enough police officers on the streets as is, and I really don't think paying overtime for something we don't want is a good use of government resources and money.

My husband is a musician on the side. We completely understand the importance of the arts. But, that's love doesn't trump my desire not to have to listen to excessive noise house after my children are put to bed. Frankly, it's a terrible location for an amphitheater. People move out towards Yukon/Mustang to get away from the city and the noise. Don't bring the noise to our front door.

Feel free to build it near your homes, but don't build it by ours. Please reach out if you have any questions/concerns.

Taylor Nelms

-----Original Message-----

From: Zac Nelms <zacnelms@yahoo.com>
Sent: Wednesday, April 3, 2024 3:29 PM
To: City Clerk Email <CityClerk@okc.gov>
Cc: Ward1 <ward1@okc.gov>
Subject: PUD 1983

RECEIVED

By The City of Oklahoma City Office of the City Clerk at 5:04 pm, Apr 03, 2024

[You don't often get email from zacnelms@yahoo.com. Learn why this is important at <https://aka.ms/LearnAboutSenderIdentification>]

To Whom it May Concern,

My name is Zac Nelms. I live at 11017 NW 20th St, Yukon, OK 73099 (OKC Limits). I'm 100% AGAINST PUD-1983. Frankly, myself and numerous other residents don't want an amphitheater near our homes for various reasons, including: noise levels past what city ordinance allows, heavier traffic, road noise, wrecks, etc. How will traffic control work? There aren't enough police officers on the streets as is, and I really don't think paying overtime for traffic control is a good use of government resources and money, which city council has sworn to be good stewards of. I understand it'll bring in money, but that isn't more important than putting the residents first.

I'm a musician on the side. I completely understand the importance of the arts. But, that's love doesn't trump my desire not to have to listen to excessive noise house after my children are put to bed. Frankly, it's a terrible location for an amphitheater. People move out towards Yukon/Mustang to get away from the city and the noise. Don't bring the noise to our front door.

Feel free to build it near your homes, but don't build it by ours. Please reach out if you have any questions/concerns.

Zac Nelms
405-887-4152

RECEIVED

By The City of Oklahoma City Office of the City Clerk at 5:04 pm, Apr 03, 2024

From: tct1972 <tct1972@sbcglobal.net>
Sent: Wednesday, April 3, 2024 2:18 PM
To: City Clerk Email <CityClerk@okc.gov>
Subject: FW: Protest PUD - 1983

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To: Oklahoma City Council and Mayor:

RE: Protest PUD 1983, Sunset Amphitheater

I am writing in protest to PUD 1983 at 810 South John Kilpatrick Turnpike. I am gravely concerned about the problems that will occur if this is PUD is approved.

First, my name is Tara Tyree and I live at 913 Periwinkle Drive. My house is without the 1-mile radius of the proposed Sunset Amphitheater. I built this house and have lived here for over 24 years. Second, I am listing the reasons why I am opposed to PUD 1983, Sunset Amphitheater.

1. Emergency Vehicles response time/inability to reach my house if needed. The traffic before and after will impede our area. We are already in an area on the outskirts of the Oklahoma City Police Department; this will make response times intolerable.
2. I work from home and work odd hours. I am usually in bed by 8:30 PM. I will not be able to rest adequately, especially because of the bass (low-frequency) noise that will be a part of these concerts. This will rattle our windows and make inside and outside our homes unlivable. Our rest time is during the weekend and with this amphitheater we will have no peaceful weeks for the majority of the year. Please protect us from this noise pollution.

3. I know you have heard from people who have children and are worried about this disrupting their lives/sleep/schedules, so I'm not going to repeat that here. However, have you thought about our animal family members? The noise (bass and higher frequencies) will put them in constant pain/terror for several hours at least three times a week for months. This is not fair to those of us who choose to see our pets as family. Please help me protect my family, human and animal alike.

4. The parking. I know in October the planning commission was told all parking would be on site. Now there is talk about parking at other areas and moving concert goers to the location by bus. This will not happen. I know with all that I am, so many people are going to park right across the street in our neighborhood. This will lead to people who have been drinking coming to our neighborhood after dark. Our neighborhood roads are already narrow. We will not be able to sustain all the parking that will overflow into our neighborhood.

I respectfully ask that you take all our reasons for opposition into account and vote NO against PUD 1983 at 810 South John Kilpatrick Turnpike. We voted for you to be our representatives. Please protect our peace and our sanity.

Sincerely,

Tara Tyree

913 Periwinkle Dr.

RECEIVED

By The City of Oklahoma City Office of the City Clerk at 5:04 pm, Apr 03, 2024

From: RJ Vinyard <rj.vinyard@cox.net>
Sent: Wednesday, April 3, 2024 2:23 PM
To: City Clerk Email <CityClerk@okc.gov>
Subject: Protest PUD-1983 Sunset Amphitheatre

You don't often get email from rj.vinyard@cox.net. [Learn why this is important](#)

I am the homeowner of the property listed below and I want to make it clear that I protest PUD-1983, application by Mustang Creek Crossing, LLC in regards to re-zoning 810 South John Kilpatrick Turnpike.

I'm, 79 years of age and my health is on the decline, last year I've been dealing with auditory hallucinations, memory loss and anxiety, the latter of which I've dealt with the majority of my life. I fear that the stress of dealing with the noise pollution and the party goers will be too much for me to deal with.

I also do not believe that such a place should be built so close to two schools. I don't want the noise or the possible violence to affect the children learning there. I taught school for 30 years and worked closely with special needs children, who will be very vulnerable to the disruption caused by the noise

Once again, I protest PUD-1983

Sincerely,

Rhonda Jean Vinyard

405-324-2245

10329 Birkenhead Road

Yukon, Ok. 7099

RECEIVED

By The City of Oklahoma City Office of the City Clerk at 5:05 pm, Apr 03, 2024

From: William Smith <bsmith@emeraldhospice.com>
Sent: Wednesday, April 3, 2024 2:04 PM
To: City Clerk Email <CityClerk@okc.gov>
Subject: Subject: Protest PUD – 1983, sunset, amphitheater

You don't often get email from bsmith@emeraldhospice.com. [Learn why this is important](#)

To: Oklahoma city clerk, mayor, city council ward #3 Barbara Peck

My wife and I want to protest PUD – 1983 application by Mustang Creek crossings, LLC to rezone 810 S. John Kilpatrick Turnpike.

To : Oklahoma city clerk, mayor, city council ward# 3 Barbara Peck

My wife and I have lived in our privately owned home located at 10025 Thompson Ave, Yukon, for 10 years. We are aware of the proposed plans for an amphitheater to be constructed near Southwest 15th and Sarah Road. This is approximately 1 mile from our home. We are aware that our hundreds of homes which are even closer proximity to this proposed location. This amphitheater would affect the following neighborhoods, just to name a few: Canyon Creek, Whispering Hollow, The Enclave, Crystal Creek in Westbury North, and Westbury South.

My wife and I both have very serious concerns about an amphitheater being constructed at this location.

Our concerns include:

A. Noise concerns: the noise concerns would be occurring predominantly when families are at home in the evening and would continue well past most children's bedtimes and likely some adult bedtimes. Bands start setting up their equipment as early as 10 AM and by the time the concerts over, you're looking at 11 to midnight. Therefore it could be a total of 12 hours of people having noise pollution.

B. Property values: Property values declining because of the amphitheater, increased traffic with congestion, high-volume sound disturbances related to actual productions, and potential for destruction to private property and increase crime.

“People might buy into a neighborhood because of a golf course but nobody ever buys into a neighborhood because of an amphitheater.”

B. Noise Concerns: The noise concerns would be occurring predominantly when families are at home in the evening and would continue well past most children’s bedtimes and likely some adult bedtimes.

C. Our Tax Funded Schools: the extra wear and tear on the parking lots of the schools. The schools will also be an increased target for vandalism and or trash on the property.

D. Our neighborhoods: People parking in our neighborhoods, leaving trash and possible destruction of private property.

We do not have personal concerns with the concept of an amphitheater being constructed in the OKC metro area, but why would anyone think this is a good idea to place in the middle of a highly populated neighborhoods?

E. Local Businesses: Businesses within 2 to 3 miles will have difficulty of conducting any business because of the volume. They won’t be able to hear the customers.

We are asking the city Council and the mayor to listen to the voters and please reject the proposed zoning for this project in its proposed location. My wife and I appreciate your consideration of these concerns. We have loved living in Yukon, and would hate to feel the need to move to another municipality because of the potential encroachment upon the safe, quiet, family – oriented environment we have come to love and enjoy. Please, listen to the citizens and vote no on PUD-1983.

Thank you,

Bill and Sue Smith
10025 Thompson Ave.
Yukon, Ok 73099

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RECEIVED

By The City of Oklahoma City Office of the City Clerk at 5:05 pm, Apr 03, 2024

From: Patricia Cantrell <ptrish1@cox.net>
Sent: Wednesday, April 3, 2024 1:16 PM
To: City Clerk Email <CityClerk@okc.gov>
Subject: PROTEST PUD-1983

You don't often get email from ptrish1@cox.net. [Learn why this is important](#)

I, Patricia J Cantrell, do hereby protest the Sunset Amphitheater, PUD-1983, application by Mustang Creek Crossing LLC to rezone 810 South John Kilpatrick Turnpike.

Why would you put an open air concert venue in a residential area? It doesn't matter which way the stage faces, the music will be heard for miles. And apparently you've already agreed to a higher decibel level that's 5db over the city sound ordinance!

You've also extended the noise time frames, Sun-Thur until 10:30pm and Fri-Sat until 11:00pm. Concerts are well known to extend past their stated curfews. They just pay the fine and move on.

Very limited parking is available. A 12,500 seat venue needs a lot more than 3,500 parking spaces. Don't fool yourselves, people won't be using UBER/LYFT as much as you seem to think.

The surrounding neighborhoods will have to deal with:

- 1 Loud music that they'll hear in their backyards, and possibly inside their houses.
- 2 Cars parking in our neighborhoods, along with even more traffic congestion than we already have. Plus, the road condition of SW 15th is terrible already. It will only get worse.
- 3 More trash blowing into the neighborhoods. It's a sad reality that a lot of people (esp those that have been drinking) just throw their trash down wherever they happen to be.

I like concerts and loud music, but I want to be able to choose when I hear it and what kind of music I hear. If approved, this takes away my right to do that. I am the homeowner of 10317 Glasgow Drive.

Thank you, Patricia J Cantrell

RECEIVED

By The City of Oklahoma City Office of the City Clerk at 5:05 pm, Apr 03, 2024

From: Casey Witvoet <casey.witvoet@yahoo.com>
Sent: Wednesday, April 3, 2024 12:41 PM
To: City Clerk Email <CityClerk@okc.gov>; City Clerk Email <CityClerk@okc.gov>
Subject: Protest PUD-1983

[You don't often get email from casey.witvoet@yahoo.com. Learn why this is important at <https://aka.ms/LearnAboutSenderIdentification>]

To whom it may concern,

We are writing to protest the PUD-1983 to rezone the property located at 810 S John Kilpatrick. We were legally notified about the rezoning on February 14th by the Oklahoma City Clerk. We have lived in our home for 13 years and we do not want an outdoor amphitheater literally across the street, 350 feet from our residence! We petition all members of the City Council and the Mayor of Oklahoma City to vote NO on April 9th, 2024. If any on the council are still undecided, we hope that these facts will inspire you to stand with our community!

This rezoning, if passed, would allow Notes Live to come into our community and fundamentally change it forever. There are many reasons why we are against this rezoning, but the most important reason is that if passed the quality of life for thousands of Oklahomans that live within a one to five plus mile radius will be forever changed. City codes and ordinances are put into place to keep people in their communities safe and set a standard of quality that must be upheld. What good are laws if everyone is not required to follow them? Giving special concessions for certain businesses is a slippery slope that should never be allowed! This leaves us questioning why so many concessions have been made for Notes Live that would not have been made for any other business? If approved, they will be allowed to break our city codes and ordinances that were put into place to protect the people who live here. They will be able to break the city sound ordinance to allow the noise level to be equivalent to a freight train running on the tracks without the horn as stated in the Planning Commission Meeting on January 11, 2024. How will we be able to hear the tornado sirens being tested on Saturdays when they are having concerts during the noon tests? Better yet how will our community be able to hear a tornado siren warning of an approaching storm with this level of noise for hours on end. Keep in mind the warning of storms with the potential to produce a tornado go off way before we even get a drop of rain. This could potentially put thousands of people in our community at risk and many people could be harmed by not being able to hear the tornado sirens to take shelter.

As a parent I am very concerned that sound checks will start at 2 pm while school is still in session! School is not dismissed for the Elementary school until 2:50 pm for bus riders. The Middle school dismisses at 3:35 pm but buses run until 5:30 pm in our neighborhood. Some Middle Schoolers walk to and from school and many parents are concerned about their child's safety if people camp out like they did at the Paycom Center for the recent Drake concert. These children need to be taken into consideration because many children need a quiet and safe environment to be able to learn and not the noise of a concert venue warming up hundreds of feet from the back of the school. Many children who attend these schools have sensory issues, ADHD and other health problems. How will this affect them?

Allowing Notes Live the ability to start at 8 am until 10:30 pm during the week and 11 pm on weekends, which is around 15 hours of constant noise, is unacceptable! Many parents put their children to bed before 9 pm and will not be able to do so with the noise and their homes vibrating. How will our community be able to live in peace in our homes? I feel we are being discriminated against because we

are a middle-class community and if you vote yes, the very laws that were put into place to protect our quiet community will be taken from us to accommodate a million-dollar company at the expense of the Oklahoma people living in Ward 3.

Active shooters target outdoor concert venues like the one in Las Vegas in 2017. Many people were killed and injured. Not to mention that amphitheaters have a hard time vetting employees since many people travel with bands so you do not know who will be working directly behind the schools while children are on the premises and on the playgrounds. When you put things behind homes and schools' careful consideration needs to be taken!

Another concession given to Notes Live is that they are not required to purchase seven more acres of land to provide adequate parking. They were given permission by the Planning Commission to only have 3,600 parking spaces for 12,500 people, plus the people who will be employed by them. This means that thousands of people will be looking for parking at the two public schools and our neighborhood. If the school is having an after-school sport event this could put children in danger of child predators trying to find parking at the school or in our neighborhoods. This will also mean that intoxicated people leaving the events will be coming into our community after 10:30 pm on weeknights trying to find their cars and being loud and disrupting our quiet neighborhood!

Notes Live has said that they will have sound monitoring stations at the corners of the property but there is no one specified in the current PUD on who would be monitoring them except that they are policing themselves. When the Planning Commission asked Notes Live how they would handle the influx of noise nuisance complaints they said their plan was to overwhelm the local police department until they created a special unit to handle the call volume. Do you think that we should allow this approach to overwhelm our local police departments instead of this company doing the right thing and hiring a third party to make them stay within the boundaries of our Oklahoma laws? I also want to bring to your attention that this location is between Mustang, Yukon and the Portland OKC police departments, so it is likely that all three police stations will be overwhelmed with noise complaints from an outdoor venue of this size.

Even if the best mitigation is used to direct the sound to the north you cannot control the sound of 12,500 people screaming, especially with the strong winds we have in Oklahoma. This venue will disrupt everyone who lives within miles of it! We are not against an outdoor amphitheater, but it does not belong behind schools or homes! The way this PUD-1983 has been written and amended puts the Oklahoma people in our community at risk for having our streets overcrowded, property values to plummet, school learning and test scores to decline, health and the wellbeing of people to decline and our quality of life to erode away very quickly! We ask you as homeowners of North Westbury to do what is right for the people who have invested all that they have to live in a quiet and peaceful community.

Sincerely,
Albert and Casey Witvoet
Homeowners at 1209 Edinburg Drive, Yukon, Oklahoma

RECEIVED

By The City of Oklahoma City Office of the City Clerk at 5:05 pm, Apr 03, 2024

From: robert watson <robertwatson1990@gmail.com>

Sent: Wednesday, April 3, 2024 12:20 PM

To: City Clerk Email <CityClerk@okc.gov>

Subject: protest PUD-1983

You don't often get email from robertwatson1990@gmail.com. [Learn why this is important](#)

I hereby protest PUD-1983 application by Mustang Creek Crossings, LLC to rezone 810 South John Kilpatrick Turnpike.

- A problem I have with this is the disturbance it will cause to our community. This community is full of children that will be kept up due to the noise. This will cause negative effects far beyond lack of sleep.

- Another issue that I have is the influx of people to the area, we do not have the infrastructure to support such a large venue. There are multiple safety concerns such as restrictions to emergency vehicles as the roads are not capable of supporting the traffic flow that will be caused by a large venue. The concerns of drivers trying to "cut through" the neighborhood after the shows to avoid traffic. This is introducing the potential of large amounts of people using out neighborhood streets as Sara Rd is not going to allow flow of traffic.

- This venue is proposed to be built backing up against the property of two schools. We have to stop and consider not only the traffic coming into the area but the disorderly conduct that often comes with concerts. This poses concerns with school property and homeowners property.

We have to consider the consequences as much if not more than the benefits that a venue may bring.

Sincerely,
Robert Watson
9924 fairfax terr
Yukon OK 73099.

RECEIVED

By The City of Oklahoma City Office of the City Clerk at 5:05 pm, Apr 03, 2024

-----Original Message-----

From: Karen Spivey <k_spivey@att.net>
Sent: Wednesday, April 3, 2024 11:32 AM
To: City Clerk Email <CityClerk@okc.gov>
Subject: Protest PUD 1983

[You don't often get email from k_spivey@att.net. Learn why this is important at <https://aka.ms/LearnAboutSenderIdentification>]

WARNING: The sender of this email could not be validated and may not match the person in the "From" field..

We Jerry & Karen Spivey protest the Sunset Amphitheater PUD-1983 application by Mustang Creek Crossing LLC to rezone 810 South John Kilpatrick Turnpike.

We ask for your protection from the nuisance this proposed project will cause. We ask for your help protecting my home, my family and my neighborhood by denying the rezoning of this project.

We are the homeowners of 2104 Hackberry Creek Ave a resident of Mustang Creek for one year.

Thank you

Jerry and Karen Spivey
2104 Hackberry Creek Ave
Sent from my iPhone

RECEIVED

By The City of Oklahoma City Office of the City Clerk at 4:51 pm, Apr 02, 2024

From: Sara Fox <sarayvonne13@gmail.com>

Sent: Tuesday, April 2, 2024 4:23 PM

To: City Clerk Email <CityClerk@okc.gov>

Subject: Protest PUD-1983

You don't often get email from sarayvonne13@gmail.com. [Learn why this is important](#)

I, Sara Fox, hereby protest PUD-1983 application by Mustang Creek Crossing LLC to rezone 810 South John Kilpatrick Turnpike.

I ask you to protect our neighborhoods and families from the nuisance this venue will cause so please deny this rezoning.

10437 Aberdeen Dr Yukon, OK 73099

RECEIVED

By The City of Oklahoma City Office of the City Clerk at 4:51 pm, Apr 02, 2024

From: Karl Edgin <kje56@hotmail.com>
Sent: Tuesday, April 2, 2024 3:23 PM
To: City Clerk Email <CityClerk@okc.gov>
Subject: Protest PUD1983 Amphitheater

You don't often get email from kje56@hotmail.com. [Learn why this is important](#)

I'm writing in protest of PUD 1983 Amphitheater application by Mustang Creek Crossing., LLC to rezone 810 South John Kilpatric Turnpike.

My name is Karl Edgin and I live at 10412 Fairfax Ln. Changing the zoning to allow this company to build this amphitheater would horribly effect ever person that lives in these neighborhood that is directly across the street from these communities.

The loud music would not end until 11:00 pm at the earliest. Disrupting everyone's sleep, Babies, grade school children, middle school, high school, college as well as advanced education.

We will lose our time to continue making memories with our kids and grandkids because we want be able to enjoy our time outside nor hear what they are saying to us hearing that they love us nor them hearing us telling them how special they are.

Enjoy a fire in the backyard roasting marshmallows' and making smores will no longer be enjoyable because we won't be able to hear each other..

Our established neighborhoods have been peaceful for decades, Allowing this to be built by your vote to change the code will greatly change our community from one that is peaceful to a negative image and impact on the surrounding neighborhoods.

Vote NO to NOT change the zoning to allow this PUd 1983 move forward

Sincerely, Karl Edgin

-----Original Message-----

From: Joe Cox <cox6735@sbcglobal.net>

Sent: Tuesday, April 2, 2024 3:15 PM

To: City Clerk Email <CityClerk@okc.gov>

Subject: Protest PUD- 1983,Sunset Amp.

RECEIVED

By The City of Oklahoma City Office of the City Clerk at 4:51 pm, Apr 02, 2024

[You don't often get email from cox6735@sbcglobal.net. Learn why this is important at <https://aka.ms/LearnAboutSenderIdentification>]

WARNING: The sender of this email could not be validated and may not match the person in the "From" field..

I herby protest PUD-1983, application by Mustang Creek Crossings,LLC to rezone 810 South John Kilpatrick Turnpike.

We have lived in our home for 32 years and have enjoyed the quiet neighborhood. This will impact the sleep quality and the excess noise will cause hearing problems.

With the Venue being directly behind the Schools, the excessive noise will interrupt their quiet School environment. This could cause learning problems.

School Children go to bed at an early hour. The excessive noise will keep them awake and can cause learning problems from lack of a good sleep.

We own our home in the Westbury North addition.
Please deny the rezoning of this PUD.

Sincerely
Joe and Connie Cox
10416 Birkenhead Road
Yukon, Ok 73099
405 760 6503
Sent from my iPad

From: Donna Hough <donnahough@sbcglobal.net>
Sent: Tuesday, April 2, 2024 3:04 PM
To: City Clerk Email <CityClerk@okc.gov>
Subject: PUD 1983, Sunset amphitheater attn. Amy K .Simpson

RECEIVED

By The City of Oklahoma City Office of the City Clerk at 4:51 pm, Apr 02, 2024

You don't often get email from donnahough@sbcglobal.net. [Learn why this is important](#)

WARNING: The sender of this email could not be validated and may not match the person in the "From" field..

I am writing this letter out of concern for our neighborhood, Westbury South. We have lived here 44 years. We have lived here because of the location and safety. The older we have gotten we have had to call EMSA several times. We have a daughter who is multi handicapped and we have always been thankful for fast emergency help. I had a heart attack 2 years ago. It only took first responders a few minutes to get to our home.

We definitely protesting against rezoning as well as an amphitheater being build so close to our neighborhood and schools. Very simply please consider the quality of life we have compared to what it would look like with an amphitheater. The noise, the traffic, safety, too close to schools and quality of life. I pray that you would show wisdom on a very important issueand vote no.

Thank you for your time,

Dr. Jack and Donna Hough
2123 Bentham Place
Yukon, OK 73099
(405)921-2603



Virus-free. www.avast.com

From: Steve & Bonnie Winter <stevenbonniew@sbcglobal.net>
Sent: Tuesday, April 2, 2024 11:51 PM
To: City Clerk Email <CityClerk@okc.gov>
Subject: Protest PUD 1983, Sunset Amphitheater

You don't often get email from stevenbonniew@sbcglobal.net. [Learn why this is important](#)

WARNING: The sender of this email could not be validated and may not match the person in the "From" field..

Dear Amy K Simpson,

We have owned our home in Westbury, at 2104 Bentham Way, Yukon, Oklahoma, since 1980. We are writing in protest to PUD 1983 at 810 South John Kilpatrick Turnpike. Rezoning this area to allow the proposed amphitheater will negatively impact the quality of life in our community. We chose to live in this location to be away from the city with its noise and congestion. There are several reasons we strongly oppose this rezoning to allow the amphitheater project to proceed. They are real life consequences of someone's seeking financial gain at the expense of families living nearby.

1. Having taught school in Mustang for fourteen years, I know noise from the Amphitheatre sound checks as currently proposed (as early as 2:00 PM) will distract the Creek Elementary and Mustang North Middle School students during their afternoon classes. Afternoon and evening activities such as tutoring sessions, practices, parent meetings, recitals, and outdoor matches or games, will also be adversely affected by noise and traffic associated with an amphitheater.
2. There are many families with young children in this neighborhood whose sleep will be disrupted by the noise from the amphitheater that can last until 11:00 PM. Adults whose morning schedules require an early bedtime will also have their sleep disturbed.
3. My husband and other combat veterans in the surrounding neighborhoods are adversely affected by loud noises, whether it is Fourth of July fireworks, cars equipped with boom boxes or a car backfiring. Booming noises associated with amphitheaters can be profoundly distressing for combat veterans with Post Traumatic Stress Disorder (PTSD), triggering memories, avoidance behaviors, and exacerbating their symptoms. It can cause flashbacks, nightmares and severe anxiety, as well as uncontrollable thoughts about combat experiences. They may have difficulty sleeping or concentrating which can make it difficult to function in daily life and can lead to anxiety, depression and suicidal thoughts. For those who do not already have PTSD it can cause late onset PTSD. It would be wrong to intentionally torment our combat veterans by bringing into our otherwise quiet neighborhoods the types of booming noises associated with an amphitheater which often includes pyrotechnics. Our veterans deserve better!
4. Ms. Hefner has assured residents that noise from the amphitheater would not be a problem, but she has not offered evidence to validate her claims. To the contrary, a letter to the editor at evanstonroundtable.com reports from other communities where residents were given the same promises only to discover they had been deceived. Residents in Virginia Beach, Palo Alto, Costa Mesa, Austin, Jacksonville, Nashville, and Gainesville have complained that artists

brought their own sound equipment with noise levels that the design of the amphitheaters did not control. Even inside their homes residents were disturbed by noise from the music and concert goers. Residents were disturbed by the thumping of the bass and percussion instruments. They were not able to enjoy their own patios because of noise from concerts from the nearby amphitheater. These are consequences of living near an outdoor amphitheater.

We ask you to seriously consider the consequences of allowing an amphitheater next to our neighborhood and to please vote against the PUD in its current form.

Sincerely,
Steve and Bonnie Winter

From: amber.simpson84@yahoo.com <amber.simpson84@yahoo.com>

Sent: Tuesday, April 2, 2024 11:15 PM

To: City Clerk Email <CityClerk@okc.gov>

Subject: PUD-1983 Protest Letter

RECEIVED

By The City of Oklahoma City Office of the City Clerk at 12:28 pm, Apr 03, 2024

You don't often get email from amber.simpson84@yahoo.com. [Learn why this is important](#)

I, Amber Simpson, hereby protest PUD-1983 application by Mustang Creek Crossings, LLC to rezone 810 South John Kilpatrick Turnpike. This land is not suitable for the proposed development. I wish to protect my, and my neighbors, quality of life. This development would negatively impact us in several ways. The noise pollution that will occur as a direct result of this amphitheater will be detrimental to the many residential areas surrounding the proposed site. Similar amphitheaters in other areas have caused noise and vibrations for miles, disturbing the peace one should have in their home. The land in question backs up to 2 Mustang schools. The children attending these schools deserve a quiet, safe, and peaceful learning environment. This will be impossible with a 2pm soundcheck. The roads surrounding the proposed site cannot handle the current traffic, much less the sudden influx of thousands of vehicles. Traffic already backs up during rush hour and school pickup and drop off times. Events of the proposed magnitude will cause gridlock, or steady traffic through the neighborhoods immediately surrounding the site. While I understand this land is prime for development, it is wholly inappropriate for this amphitheater.

I am the homeowner at 12429 SW 15th Ter. I respectfully ask you to deny the rezoning of this application.

Sincerely,

Amber Simpson

From: Steve and Kathy Miller <stevesaccount@live.com>

Sent: Tuesday, April 2, 2024 9:46 PM

To: City Clerk Email <CityClerk@okc.gov>

Subject: PUD 1983 Protest letter

RECEIVED

By The City of Oklahoma City Office of the City Clerk at 12:28 pm, Apr 03, 2024

You don't often get email from stevesaccount@live.com. [Learn why this is important](#)

I am writing to protest the Amphitheater being built on the land off the turnpike.

There are several things I think should be considered (maybe they have and maybe these will be some new things).

1. I know from a city point this will bring in tax dollars which is what makes the world go around. However, I feel the property values around the area will go down due to the excess traffic and noise. This in turn will cause less tax dollars. Since the amphitheater will not operate year around there will be a lot of tax dollars that would not be collected if the area was built up to be shopping. You could be collecting tax dollars every day of the year (maybe not Christmas but for sure all the others). I would be willing to bet that Crest will bring in more tax dollars than the amphitheater why not get a Costco built on the land there is not a Costco on this side of town.
2. I am pretty sure that with the heat in Oklahoma not many of the bigger concert groups will want to be playing outdoors in that kind of heat. Which I would assume the owners of the theater are saying big name groups will be coming. (We should think that through).
3. I think the roads to the location were not set up to handle the traffic that they will be getting. I have not seen any survey crews checking on the traffic. Not all people will use the turnpike like a lot of people think. I will not pay a toll if there is a free road to use.
4. Mentioning the noise level and decreasing the home values one thing I do not understand. Why would the city allow louder music at this venue as opposed to the Zoo theater. Why do we need louder music when we were told by our parents that the loud music will cause you hearing loss later in life. I can testify to the hearing loss. They do not need the music louder.
5. I am not sure if drinking will be allowed but I am sure if not at first they will be trying to get it approved. If they do then when the concert is over and all the people and cars are leaving they will find the fastest way out and some of that will be the neighborhoods. This could possibly cause cars parked on the street to be hit or even if a pedestrian if they are out which they could be. We surely do not want that.
6. Last thing that I would like to mention is about what kind of activity will be happening in the area when the concerts are not going. Will this be a place that people come to buy and sell drugs. I personally do not want this being done around my neighborhood.

Thank you for your time reading my concerns, please vote to reject the PUD 1983

Steve Miller

11845 SW 3rd St

Yukon, OK 73099

stevesaccount@live.com

RECEIVED

By The City of Oklahoma City Office of the City Clerk at 12:28 pm, Apr 03, 2024

From: Deborah Pemberton <grandmadnok@yahoo.com>

Sent: Tuesday, April 2, 2024 5:58 PM

To: City Clerk Email <CityClerk@okc.gov>; The Mayor <mayor@okc.gov>; Ward3 <ward3@okc.gov>

Subject: Protest PUD-1983 Sunset Amp

You don't often get email from grandmadnok@yahoo.com. [Learn why this is important](#)

I am writing to protest PUD-1983 application by Mustang Creek Crossings, LLC to rezone 810 South John Kilpatrick Turnpike.

I am asking the City Council to protect the homeowners and occupants of the surrounding neighborhoods from the excessive noise levels venues such as the Sunset Amphitheater generate. I am deeply concerned that these noise levels will affect my quality of life, as well as my neighbor's, especially children and those suffering from anxiety disorders.

I reside at 10305 Exter Ave, Yukon in the Westbury North division and I am respectfully asking you to deny the rezoning of this PUD.

Sincerely,

Deborah Pemberton
10305 Exter Ave
Yukon, Oklahoma 73099
405-324-8155

RECEIVED

By The City of Oklahoma City Office of the City Clerk at 12:28 pm, Apr 03, 2024

From: Alvin <chipmunkokc@aol.com>
Sent: Tuesday, April 2, 2024 5:31 PM
To: City Clerk Email <CityClerk@okc.gov>
Cc: Ward3 <ward3@okc.gov>
Subject: Protest PUD-1983, Sunset Amp

You don't often get email from chipmunkokc@aol.com. [Learn why this is important](#)

I hereby protest PUD-1983 application by Mustang Creek Crossings, LLC to rezone 810 South John Kilpatrick Turnpike.

I oppose this rezoning and building of the Sunset Amphitheater near my home. I am concerned that the noise level will affect the property value of my home of 43 years.

I am the homeowner of property at 10305 Exter Ave and ask you to deny the rezoning of this PUD.

Sincerely,

Alvin Pemberton
10305 Exter Ave
Yukon, OK 73099-7565
405-414-2943

From: Hot Dog <hotdogokc@yahoo.com>
Sent: Tuesday, April 2, 2024 5:19 PM
To: City Clerk Email <CityClerk@okc.gov>
Subject: Protest PUD 1983

RECEIVED

By The City of Oklahoma City Office of the City Clerk at 12:28 pm, Apr 03, 2024

You don't often get email from hotdogokc@yahoo.com. [Learn why this is important](#)

Amy Simpson,

First off, something is raising a red flag with Bob Mudd. He is the President and Chief Operating Officer of Notes Live which is the company that owns the Sunset Amphitheater. Prior to him joining Notes Live in 2021, he came from an extensive line of work in which he founded orphanages in other countries. He also had foster care operations in the United States. He was the President of a company called Adventures in Missions for 15 years, a multi million dollar "non profit" missionary operation that sent hundreds of thousands of young high school aged Christian students to go do God's Work abroad. The mission trips cost upwards to \$16,000 per student that was raised by fundraising. After some online digging and hours of researching, I've come across some online threads where some of these missionary students are claiming their fundraising money was stolen by the leaders and directors of Adventures in Missions. Many of the students are claiming their experience was very "cult like". They said the leaders are "false prophets" and that they were deceived by them. Parents of some these missionary students joined in on these online threads where they shared their concerns. They said the leaders and directors of Adventures in Missions aren't who they claim to be and that the operation is corrupt. The deeper I dig, the creepier it gets.

My question is: How does a person go from running a Christian based missionary operation and being in ministry....to having orphanages.....to doing a 180 degree turn and is now selling \$500,000 fire pit suites for Sunset Amphitheater with direct ties to the music industry? Something doesn't add up here. And that brings me to my main concern about the amphitheater. They want to place it at the foot of 2 Mustang public schools??? The amphitheater has no business sharing the same space and facilities with children....PERIOD! I say facilities because they will pay Mustang Schools a large amount of money to use the school parking lot for their overflow parking just as they are going to do at their Colorado Springs location. They will be sharing the same space due to overlapping events that will take place at the Mustang Creek schools. This is UNACCEPTABLE, predatory and disgusting!!!

As far as noise goes, the location of the proposed site of the Sunset Amphitheater is absolutely too close to Westbury North, Westbury South and Westpointe housing additions. Our house backs up the the intersection of SW 15th & Sara Rd. The noise levels will be unbearable for us. I have three cats that won't enjoy concert nights either. They will be stressed out.

My boyfriend Bobby has lived here for 35 years. It saddens me to see him in distress with this proposed site infringing upon him. He will be 70 years old this year. Several years ago, we celebrated him paying off this home. He puts his heart and soul into his house and his yard work. The thought of us having to pack up and move due to these people preying upon us is heartbreaking. We don't deserve this.

Another concern is SAFETY. The gridlock traffic that the proposed Sunset Amphitheater will cause is going to be a nightmare. We live a mile and a half from Fire Station 33. We've had to use them several times due to Bobby having heart issues. Our concern is that gridlock traffic will prevent help from arriving in a quick manner. There are a lot of older people that live in Westbury and fire trucks and ambulances frequent this neighborhood quite often. Also, 2 housing additions will literally be trapped from coming or going due to gridlock traffic. They do not have any back exits out of their neighborhood....only the one off of Sara Rd.

As far as crime goes, we both have worked Bricktown for many years and know exactly what will happen: overflow parking in front of our house, people urinating in public or people's yards where children might be, beer cans and drug paraphernalia thrown on the ground, trash, honking, road rage, drunk driving, violent fights, stabbings, shootings, murders, rapes, drugs, SEX TRAFFICKING....it will be very stressful. The cops will not be there to protect us! We will be on our own fending for

ourselves. Please vote NO and prevent this operation of Notes Live from destroying us, our neighborhood, and the children of this community.

To conclude, I, Gale VanCampen, hereby protest PUD-1983 application by Mustang Creek Crossings, LLC to rezone 810 South John Kilpatrick Turnpike.

Thank you for your time and consideration,
Gale VanCampen
1605 Edinburg Drive
Yukon, OK

RECEIVED

By The City of Oklahoma City Office of the City Clerk at 12:28 pm, Apr 03, 2024

From: Regina Allen <lilonerfa@gmail.com>

Sent: Wednesday, April 3, 2024 7:56 AM

To: City Clerk Email <CityClerk@okc.gov>; The Mayor <mayor@okc.gov>; Ward3 <ward3@okc.gov>

Subject: Protestpud-1983 ampitheater/yukon

Some people who received this message don't often get email from lilonerfa@gmail.com. [Learn why this is important](#)

I, Regina Allen, hereby protest PUD-1983 application by Mustang Creek Crossing LLC to rezone 810 South John Kilpatrick Turnpike.

I am a homeowner at 1020 Hyacinth Hollow Drive.

This is not a welcome business in our neighborhood. Please do not vote it in.

Thank You,
Regina Allen

RECEIVED

By The City of Oklahoma City Office of the City Clerk at 12:28 pm, Apr 03, 2024

From: Ethan Hall <ehall758@gmail.com>
Sent: Tuesday, April 2, 2024 10:01 PM
To: City Clerk Email <CityClerk@okc.gov>
Subject: Protest - PUD 1983

You don't often get email from ehall758@gmail.com. [Learn why this is important](#)

To whom it may concern:

I, Ethan Hall, protest PUD-1983 by Mustang Creek Crossing, LLC to rezone 810 S John Kilpatrick Turnpike.

I have been a resident in Westbury North for 27 years and the main concerns I have are listed below.

1. **Noise Pollution:** This venue will sit directly beside numerous homes, daycares, and multiple public schools. Based on the information I have seen posted by the proposed developers, there is no way for them to manage the sound waves in a way that it would not affect local residents in their homes or children at school. I have attached a PDF to this email that contains studies conducted on the effects of noise frequencies and the direct impact on human health. Based on these studies, humans experience increase levels of sleep disorders, anxiety, mental fatigue and decreased mental performance. Our children are already under additional daily stresses, how can we knowingly put in a venue that could directly affect their home life and subsequently their ability to perform during the school day? I'd like you to imagine a car driving through your neighborhood with their base speakers on full blast and all of their windows down. We've all heard these sounds at one point or another and recognize that they are an annoyance. Now imagine that the car doesn't continue to drive past, the music continues to play for hours on end through the entirety of a concert, multiple nights a week, year-round. I did not see any noise mitigation or physical noise abatement structures listed in the proposal from Live Notes, how are they planning to manage the way these sound waves carry through the air and the ground? Regardless of the additional reasons I will list below, this noise pollution issue should be the number one reason why this project does not get approved for rezoning.
2. **Increased Traffic:** I believe that the addition of the Sunset Amphitheater would make the current traffic situation in our area much worse. If you have not driven down SW. 15th St. from 7AM - 8:30 AM, 2:15 PM - 4PM or 5PM - 6:30 PM I would encourage you to take that drive. Between people trying to drop their children off at two different public schools and additional people trying to get to work or back home from work, driving down SW. 15th St. is almost impossible to navigate for a large portion of the day. What should take 2 to 3 minutes ends up taking 20 to 30 minutes. Even with the proposed road widening and proposed turnpike tunnel there is no way to see how this area will be able to handle the additional traffic from a concert venue. We can barely handle having 2 schools let kids out in the afternoons, now we think these roads will be able to manage thousands upon thousands of extra vehicles with no access to I-40 on Sara Road? The truth is that

people will inevitably use my neighborhood to cut through to avoid traffic which will only add to more traffic issues at other exits onto SW 15th or Sara Rd. That doesn't include the individuals who will want to park their cars in Westbury streets and walk to the concert to avoid parking fees. There are currently 3,500 parking spots planned for 12,500 people. Knowing that individuals will need to drive to the venue, how will 1/4 of spots accommodate all of the vehicles needed. What about the addition of rideshare vehicles parked and waiting for passenger pick ups? The traffic issues will be endless and unavoidable, just like when an event is released from Paycom Arena. Are we to expect that main roads will be blocked off by police and concert traffic will take precedence over those who need to access our neighborhood to get to our homes? This is a public safety concern that should also be top of mind.

3. **Increase in Crime & Potential Emergencies:** When bringing 12,500 additional people to a suburban area you can anticipate that there will be emergencies of some nature. When we have an unstable traffic situation and already delayed response times from OKCPD. There is no OKCPD or Canadian County Sheriff's station close to this area. What if a resident has an emergency and first responders are unable to reach us due to traffic blocks? Minutes, even seconds, count when an emergency situation arises. How will we be reached in a timely manner? These emergencies wouldn't just include medical or those of residents but concert goers as well. With any concert venue there is alcohol present and the use of drugs - numerous situations could happen - medical emergencies, physical assaults, robbery, etc. How can we ensure the public's safety and not expect an increase of DUIs and those driving impaired from drugs? What about the fact that these potential situations will be a mere hundred feet from 2 schools and close to 3,000+ homes that have families. Lastly, we have already seen a significant increase in crimes in the Westbury North & South neighborhoods. Personally, our vehicles have been broken into on 4 separate occasions. Like with anything, the more people it attracts the more crime that will come with it. We can't handle more break-ins and random people wandering the neighborhood streets while our families sleep. The "ifs" are too important to wonder and hope they don't happen.

In closing, I hope you and the rest of the Council will see there is much more to be lost here than can ever be gained by an "economic impact". Dropping a concert venue for 12,500 people in the middle of almost 4,000 residents and a town that is already growing too fast is a recipe for disaster. Please think about the long term effects on our residents, our children, and our community. I reside at [10016 Fairfax Terrace Yukon, OK](#) and I ask you to please **vote against rezoning for PUD-1983**.

Articles of similar amphitheaters and the issues they have caused local residents:

[Round Rock Amphitheater, Round Rock, Texas](#)

[Hayden Homes Amphitheater, Bend, Oregon:](#)

Thank you,
Ethan Hall

[10016 Fairfax Terrace](#)
[Yukon, OK 73099](#)

March 13, 2024

2024 MAR 29 PM 5:14
HOLST AND ASSOCIATES

Dear Mr. Mayor and Members of City Council,

We are contacting you in protest to PUD 1983 at 810 South John Kilpatrick Turnpike. There will be a problem if this is approved.

Point 1: The noise from the 12,000 seat amphitheater will be very loud to the surrounding neighborhoods. We have a family and pets just like you and deserve a peaceful neighborhood.



Point 2: There is evidence that the level of low frequency vibrating bass permeates the entire house and to some it is unbearable.

Point 3: If the venue is responsible for self-regulating their noise levels. I feel our neighborhood will be left helpless and our peaceful evenings will be a thing of the past.

Point 4: This will cause a hardship for Abigail as she works from home overnights and since our property backs up to Sara Road there will be no way to block the sound while she is working.

I am renting and soon to own the property at 1507 Edingburg Drive Yukon, Oklahoma 73099. I ask you to vote against the PUD in its current form.

Sincerely,

Rodney L Schmerfeld

Abigail A Schmerfeld

405-209-8600

RECEIVED

By The City of Oklahoma City Office of the City Clerk at 5:06 pm, Apr 03, 2024

To: Oklahoma City Council & Mayor

Subject: PROTEST PUD 1983,
Sunset Amphitheater

From: Homeowner Carlisa Hudspeth
at 10425 Leicester Dr. Yukon, OK 73099
(405) - 245-0537

I am the homeowner and my protest
is included on the next several pages.

I ask you all to vote NO = AGAINST this
PUD 1983.

10425 Leicester Dr.
Yukon Ok 73099

Carlisa Hudspeth

To: Oklahoma City Council and Mayor

Subject: Protest PUD 1983, Sunset
Amphitheater

I am writing in PROTEST to PUD 1983
at 810 South John Kilpatrick Turnpike.
There will be many serious problems if this
change is approved.

① Noise Pollution-

The studies I have read with similar venues
with similar noise levels create sound being
heard & felt. My daughter has ADHD and struggles
with sleep, the noise and vibration along with
falling objects in our home will not be conducive
for her or anyone living within 5 miles of
this. This noise pollution will also affect all animal
life. We already deal with Earthquakes and now
as a residential homeowner I and many others
will have to deal with vibration from noise.

② Safety-

I am a single mother of an 8 year old. The
reason I bought my home 14 years ago was
because this is a safe neighborhood with
close schools. Westbury South is a wonderful
neighborhood to raise children but now I'm going
Pg. 2

to be concerned about individuals driving into our neighborhood & parking, and then coming back after concert being drunk and high. I will have to be concerned with the employees that this venue will be hiring being in such close proximity to 2 of our schools and my home along with homes being turned into short term rentals for these shows and having to deal with all that each weekend. I know that none of you on the City Council would appreciate this venue being across the street from your home. There are so many issues w/ short term rentals like; drugs, alcohol and major crimes.

③ Traffic-

It is a big one as well. It already takes me 25 minutes to get from Mustang Rd on SW 15th traveling east to Sara Rd, I can't imagine or I can what chaos it will be on concert days. I have many older neighbors who often need EMS and my Mother lives with me and almost passed in 2021 from COVID. She was on a ventilator for 14 days and in Mercy for 2 months before she could be released. She has never fully recovered and still suffers from

10425 Leicester Dr.
Yukon OK 73099

Carlisa
Hudspeth

many serious illnesses and at times have needed emergency assistance. It's not just that but this will rob all of us from leaving our homes for simple pleasures of going out to eat or shopping because of the traffic issue. This will take away from our rights to have a peaceful, safe and advantageous home ownership.

(4) Home Property Values.

I am a real estate broker and own my own real estate company. The homeowners that surround this proposed venue will be negatively impacted by this venture. I will be negatively impacted by this venture. The asset of my home equity is at least \$180K. That will be severely reduced because of this project. This is so wrong to do this to hard working Oklahomans. It's not the ~~OK~~ Oklahoma way or is it American to destroy the average Oklahoman to put millions of dollars into the pockets of the rich and destroy all of the people that will be hurt financially by this project. You cannot take an event center like the Paycom and dump it in a family-friendly, residential and public school area. You will be destroying our way of life along with our finances.

Sincerely, Carlisa Hudspeth

405-245-0537

Pg 4