NOISE

1) DEIS uses old, very questionable noise data, and OMITS newer more reflective and comprehensive data:

The DEIS used old and questionable noise data from 1992 (pg. 3-28)—regarding percent annoyed at DNL levels. The data was updated in 2021 using a more comprehensive and aviation-specific study, and found to be insanely more severe—that is insanely higher percent annoyed that data in DEIS.

Updated noise data: https://www.gao.gov/assets/gao-21-103933.pdf (pg. 24); Compare to DEIS (pg. 3-28).

The data used from 1992 has a number of issues including but not limited to:
-Six data sets excluded from five separate studies "because they did not show a significant correlation between da-night average sound level and the percentage of the population reporting to be annoyed (%HA)."
-53 of 453 data points removed "This exclusion resulted in a loss of 53 data points (12% of the original data points, leaving 400 data points as the new total." Additionally, was the decision impacted by stopping at the even psychological number of 400? It just seems suspicious that the data removal was stopped at the whole number of 400—because something like the should not influence data analysis.
-This used multiple times of noise data from a combination of aviation, railway, and traffic whereas the 2021 data was just aviation—suggesting it would be more accurate

Noted in the Finegold paper:

"Noise from an aircraft overflight virtually surrounds a home, entering the living and sleeping areas through the roof and two or more sides of the dwelling, while street traffic noise enters predominantly through only one or two sides of the dwelling. This difference in sound exposure within a home is, typically, not accounted for, or discussed,in social surveys when researchers estimate the noise exposure of subiects."

See: https://nwtteis.com/portals/nwtteis/files/references/Finegold_1993_Community_Annoyance_and_Sleep_Disturbance.pdf

While the 2021 data is vastly better, this method of using A-weighted DNL are correlating it to percent annoyed is flawed. This is because as I note below it's reasonable to expect different impacts based on the actual flight volume and flight numbers (1 flight at 114.4 dB vs. 100 flights at 94.4 dB). Additionally, the A-weighing erases a substantial portion of the low frequencies, so if you found a different noise source that lacked lower-frequencies it is likely to get a different percent-annoyed response for same DNL. In summary, this begs for numerous studies to be done to see if A-weighted DNL or even C-weighted DNL are consistent across a wide variety of types of noise, such as machine noises (aviation, vehicles, etc.) and other noise sources such as natural streams and waterfalls. These points need to be studies—observation, asking questions, and hypoheses/predictions, are the first steps of the scientific method, the next steps are experiments and tests—but the public does not have the authority to do such experiments nor the resources—so you should carry them out.

2) DNL metric misleads and grossly misses real-world impacts:

Would you rather have:
a) 1 flight at 114.4 DB
or
b) 100 flights at 94.4 DB?
Both are considered the same impact in that they have equal DNL values of of 65 DB.
I'd guess most would rather have 1 flight at 114.4 DB, since it impacts you once a day/night period rather than 100 times in a day/night period—constantly waking you up at night or disturbing you during the day… and that one major reason why DNL is such an inaccurate measure of noise impact—it misleads by allowing for dilution of impacts.
The DNL data is from page 2 of https://www.gao.gov/assets/gao-21-103933.pdf

DNL also allows for dilution of impacts by incorporating short duration high noise events into an area with otherwise lower noise, and gives the impression that the noise impacts aren't as bad as they are.

Using DNL, especially for short term noise, is an extraordinary misuse of the metric as it dilutes and hides the short term noise impact, as well as hides potential for both short-term and long-term hearing and vestibular damage—-from the short-term exposures.

The noise will negate occupational workers adherence to 8-hour shift Recommended Exposure Levels by NIOSH, and thereby increase the odds of noise-induced hearing loss (NIHL)

NOISH's Recommended Exposure Limits (RELs): "The REL is based on exposures at work 5 days per week and **assumes that the individual spends the other 16 hours in the day, as well as weekends, in quieter conditions."**

[Citing DNL values in response to this hides the very high level—greater than 85 and 100 dBA values people will be exposed to—which are reasonable to assume will negate their adherence to NIOSH's RELs during their work hours]

The military aviation noise will not allow these workers to spent the other 16 hours and weekends in quieter conditions.

See: https://blogs.cdc.gov/niosh-science-blog/2016/02/08/noise/

This implies that NIHL is based on cumulative noise per time and has the DEIS addressed that they will substantially increase cumulative noise exposure? I think it's unlikely or if so it's most likely very inadequate.

A subset (~8%) of the population is a higher risk for noise-induced-hearing-loss (NIHL):

"Occupational noise exposure limits are established to simplify the complex question of risk and protect as many workers as possible from the effects of noise. The NIOSH REL is **not designed to protect all workers from all hearing damage**. When setting this limit, NIOSH acknowledged that approximately **8% of workers could still develop hearing loss**. In order to protect the most sensitive 8% of the population, NIOSH recommends that hearing protection be worn whenever noise levels exceed 85 dB(A) regardless of duration. "
[my bold/underline annotation]

Takeaway: Roughly 8% of population could get NIHL much easier than others.

See: https://blogs.cdc.gov/niosh-science-blog/2016/02/08/noise/

Noise-induced damage of vestibular organs not covered

Noise-induced vestibular damage not covered in DEIS:
-Vestibular organs (semicircular canals, utricle, and saccule) are in inner ear near the hearing organ
-Studies suggest vestibular organs more sensitive to lower frequency sounds (e.g. aviation).
-Numerous newer studies show casual (not correlation, but cause-effect) relationship of noise-induced vestibular damage
-Hearing Protection Apparatus did not protect vestibular organs from noise in environment where it protected against hearing loss.
-High magnitude impulse noise can damage cochlea and vestibular organs
-Single noise exposure can cause vestibular organ damage
-One study showed chronic exposure to 70 dB SPL (using weighing curves, this corresponds to 51 dBA) low-frequency noise caused impaired balance in mice. So if this corresponds to DNL 51 dB then for low-frequencies it is likely a health threat. The study also shows frequency-specific health effects of noise at equal dB SPL. The study is the one listed below titled “Chronic Exposure to Low Frequency Noise at Moderate Levels Causes Impaired Balance in Mice”;

Studies (includes brief points):

https://pubmed.ncbi.nlm.nih.gov/36093670/ (70% of workers exposed to occupational noise [which is typically low-frequency] had vestibular alterations ; 100% of control group had normal vestibular assessment)

https://pubmed.ncbi.nlm.nih.gov/32074366/ “Exposure to Intense Noise Causes Vestibular Loss”

https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3387207/ (“Chronic Exposure to Low Frequency Noise at Moderate Levels Causes Impaired Balance in Mice”; Equal decibel level—low-frequency noise group developed balance issues—high frequency noise group no symptoms)

https://pubmed.ncbi.nlm.nih.gov/31576414/ “Here, we show that acute exposure to LFN [low-frequency noise] at 100 Hz, 95 dB, but not at 85 dB or 90 dB, for only 1 h caused imbalance in mice”

https://pubmed.ncbi.nlm.nih.gov/31875485/ “Intense noise exposure alters peripheral vestibular structures and physiology” “These data suggest that a single intense noise exposure may impact synaptic function in calyx-only terminals in the striolar region of the sacculus.”

https://pubmed.ncbi.nlm.nih.gov/32978359/ “Three out of five cases displayed little or no hearing loss, indicating that vestibular function is more at risk than hearing acuity to continuous noise exposure in dental settings.” “Exposure to loud noise in dental laboratories severely impacts the functioning of the vestibular system of the inner ear more than the cochlea.” [Note: Dental noise is low-frequency]

https://pubmed.ncbi.nlm.nih.gov/37203123/ “Noise can lead to damage to both auditory and vestibular functions”

https://pubmed.ncbi.nlm.nih.gov/32523903/ “We have documented the possibility of vestibular lesion, along with cochlear damage, related to chronic acoustic trauma.”

https://pubmed.ncbi.nlm.nih.gov/22568995/ “These findings are consistent with previous studies that suggest that the sacculocollic pathway may be susceptible to noise-related damage”

https://pubmed.ncbi.nlm.nih.gov/26970474/ “These results suggest that noise exposure not only causes hearing loss, but also causes substantial damage in the peripheral vestibular system in the absence of immediate clinically measurable vestibular signs. These peripheral deficits, however, may lead to vestibular disorders over time.”

https://pubmed.ncbi.nlm.nih.gov/36742751/ “Vestibular Hypersensitivity in Patients with Chronic Noise Exposure”

https://pubmed.ncbi.nlm.nih.gov/37849955/ “Peripheral vestibular loss in noise-exposed firefighters”

https://pubmed.ncbi.nlm.nih.gov/1733458/ “It concludes that the verdict must be "not proven"--that is, although such damage is possible, the evidence is not strong enough to regard it as probable.” [1992 review study here, before the emergence of better done studies above, including newer controlled studies above. It’s also a subjective opinion Shows the importance of relying on newer studies in acoustic damage, as more evidence has emerged, as the pool studies is limited all together, and especially pre-2000]

https://pubmed.ncbi.nlm.nih.gov/34629003/ “ This study demonstrated that HPAs [Hearing Protection Apparatus] do not protect the vestibular system but protect the hearing system in the inner ear from the harmful effects of noise.” [Since hearing protectors are much less effective at under 125Hz low-

frequencies, it is reasonable to assume low-frequency noise likely contributed the most to the vestibular loss. Additionally conventional hearing tests only go down to 250Hz,so who knows what effects on hearing this noise has below that.]

https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7986451/ "The Effect of Noise Exposure on the Vestibular Systems of Dental Technicians" —"All test subjects experienced some form of vestibular impairment, including benign paroxysmal positional vertigo (BPPV), endolymphatic hydrops (Meniere disease), or a combination of both. Three out of five cases displayed little or no hearing loss, indicating that vestibular function is more at risk than hearing acuity to continuous noise exposure in dental settings."

https://pubmed.ncbi.nlm.nih.gov/37497526/ "Balance beam crossing times are slower after noise exposure in rats"

https://pubmed.ncbi.nlm.nih.gov/29118200/ "Vestibular short-latency evoked potential abolished by low-frequency"

https://pubmed.ncbi.nlm.nih.gov/37767687/ "Noise-induced damage in the zebrafish inner ear end organs: evidence for higher acoustic sensitivity of saccular [Saccule is part of the vestibular organs] and lagenar hair cells"

https://pubmed.ncbi.nlm.nih.gov/38440558/ "We highlight the importance of assessing the effect of noise exposure on vestibular function, especially among those prone to occupation-related vestibular loss."

https://pubmed.ncbi.nlm.nih.gov/30205364/ "Inner Ear Damage by Firecracker Trauma"…."This blast injury simultaneously damaged the cochlea, saccule and utricle [saccule and utricle are vestibular organs], but spared the semicircular canals, indicating that blast exposure potentiates the adverse effect of noise exposure on both cochlear and vestibular partitions."

[The cumulation of all these studies and observational data suggest vestibular organs are more sensitive to low-frequency noise, which is characteristic of aviation sonic booms, so I would expect worse damage to the vestibular organs from them.]

https://pubmed.ncbi.nlm.nih.gov/23143507/ "Sequence of vestibular deficits in patients with noise-induced hearing loss"

https://pubmed.ncbi.nlm.nih.gov/18936359/ “The saccule [saccule is a vestibular organ] can exhibit temporary or permanent functional loss resembling hearing threshold shifts in guinea pigs following noise exposure.”

https://pubmed.ncbi.nlm.nih.gov/35325777/ “Our study demonstrates not only that noise-induced hearing loss is frequency-dependent but also that the degree of hearing loss is affected by sex in zebrafish, emphasizing the need to consider sex in NIHL studies.” “Moreover, the number of hair cells remarkably decreased in the rostral region of the saccule, after exposure to 1 kHz and white noise, whereas zebrafish exposed to 200 Hz noise showed a decrease in hair cells in the caudal region. “

https://pubmed.ncbi.nlm.nih.gov/24282646/ “Sound sensitivity of the saccule [saccule is a vestibular organ] for low frequencies in healthy adults”

https://pubmed.ncbi.nlm.nih.gov/38961203/. (“Blast wave exposure, a leading cause of hearing loss and balance dysfunction among military personnel, arises primarily from direct mechanical damage to the mechanosensory hair cells and supporting structures or indirectly through excessive oxidative stress.”)

https://pubmed.ncbi.nlm.nih.gov/38440558/
(“A literature search identified only three studies involving 137 patients (mean age: 44.4). Semicircular canal deficit was found in 50.4% of the included participants, with lateral canal predominantly affected (71%). We highlight the importance of assessing the effect of noise exposure on vestibular function, especially among those prone to occupation-related vestibular loss”

https://pubmed.ncbi.nlm.nih.gov/39245964/
(“Self-reported assessment of spatial orientation does not robustly correlate with objective peripheral vestibular function.”

https://pubmed.ncbi.nlm.nih.gov/30218385/
“Canal deficit was detected in 20 (55.5%) of 36 patients in the noise exposure hearing loss group and was detected in 2 (6.6%) of 30 participants in the control group. There was significant loss of capacity for VOR gain in patients with noise exposure hearing loss.” “In the present study we found that exposure to noise can cause vestibular dysfunction. “

Regarding exposure time: Following NIOSH and OSHA recommended exposure levels methodology, where NIHL hearing loss is a function of time of exposure and sound level, it is reasonable to assume that similar is true for vestibular

damage (in fact the mice studies point to this showing that 95db for 1 h of low-frequency caused damage, and 1 month of 70 dB SPL low-frequency caused damage—https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3387207/**,** and https://pubmed.ncbi.nlm.nih.gov/31576414/**),** so it would be incorrect to disregard these studies on the basis that they don't precisely match the noise exposures the public will face, but it would make more sense to use them as a guide to study your noise amounts and see if they cause vestibular damage—such doing the same type of studies on mice and on people exposed to high levels military aircraft noise.

Usage of A-weighed decibels hides acoustic impact:

-Potential for ear damage (e.g. vestibular damage) seems to depends on the unweighted acoustic energy according to newer studies listed above.
-A-weighted decibels erases portions of the lower-frequencies that contribute to vestibular damage
-A-weighted does not accurately reflect the amount of noise, and ease by which noises, enter homes. You can have two noises with the same A-weighted decibel level but the lower-frequency noise will more easily penetrate walls and wake up or disturb occupants.
-It should be studied if A-weighted decibels reflect hearing sensitivity for people with vestibular impairment, compared to those without it. And, additionally it should be studied what percentage of the population has vestibular impairments as the studies above suggest a significant portion.

Aviation noise is practically impossible to soundproof:

Noise from aviation (sub-100Hz low-frequency) very easily travels for many many miles, easily goes through multiple layers of wall and insulation. C-130s at higher altitude can be heard over 20 miles away indoors under the right conditions allowing noise to travel well beyond the boundary of the MOAs.

As a reference, a study on Navy growler jet noise found "Jet noise was heard at depths of 30m (approx. 100 feet) below the sea surface, at noise levels above thresholds known to trigger behavioral changes in fish, seabirds and marine mammals, including orca whales, which are known to inhabit the area." It was also noted " and can be heard deeper underwater than previously estimated."

Source: https://www.npca.org/articles/2776-new-studies-find-navy-growler-jet-noise-around-olympic-national-park

The Navy Growler Jets are likely comparable or lower in sound levels that Air Force jets proposed here.

So 100 feet of water—think about how much mass that it is and how practically impossible it would be to match that level of mass in trying to build a soundproof home—and still caused effects on the animals!

Even the most soundproof places in the world cannot completely block this kind of noise. I've been told first-hand by a well-known anechoic chamber. When I asked if the "chamber was completely soundproof against the noise and vibration from low flying helicopters, louder motorcycles, and all other low-frequency dominant outside noises? " the answer implied that it was not.

Chart here shows the huge discrepancy in ability to sound-reduce sub-100Hz noise compared to higher frequencies shown in graphs on this website: https://www.tmsoundproofing.com/decoupling-explained.html —even with these advanced, extremely expensive, and likely structure-limiting soundproofing techniques (i.e. the mobile homes that are common in rural areas likely cannot accommodate this kind of renovation due to structural limitations.)

Noise pollution affects sleep even if you don't consciously wake up:

"There are people who live on busy roads who say things like, 'I don't even hear the noise.' But even if you don't hear it, or you don't consciously notice it, it's potentially still harmful to your health. I think that was the biggest surprise to me when I started to look into this research."

Source: https://www.hsph.harvard.edu/news/features/noise-can-harm-your-health-even-if-you-sleep-through-it/

Impulse noise/sonic boom effects on ear
Both OSHA and NIOSH have a peak impulse noise limit of 140dB. The sonic booms noise data in the DEIS is not in DB so doesn't allow for the public to cross-reference these values easily.

Source for OSHA: https://www.osha.gov/laws-regs/regulations/standardnumber/1910/1910.95

Additionally, there is no analysis of the potential for vestibular organ damage from this noise. See noise-induced vestibular damage study list above where I reference this topic in bold. Also I have highlighted a few of those studies below that are related to intense and/or impulse noise causing noise-induced vestibular damage—including just one exposure.

https://pubmed.ncbi.nlm.nih.gov/38961203/. (“Blast wave exposure, a leading cause of hearing loss and balance dysfunction among military personnel, arises primarily from direct mechanical damage to the mechanosensory hair cells and supporting structures or indirectly through excessive oxidative stress.”)

https://pubmed.ncbi.nlm.nih.gov/30205364/ “Inner Ear Damage by Firecracker Trauma”….“This blast injury simultaneously damaged the cochlea, saccule and utricle [saccule and utricle are vestibular organs], but spared the semicircular canals, indicating that blast exposure potentiates the adverse effect of noise exposure on both cochlear and vestibular partitions.”

https://pubmed.ncbi.nlm.nih.gov/32074366/ “Exposure to Intense Noise Causes Vestibular Loss”

https://pubmed.ncbi.nlm.nih.gov/31875485/ “Intense noise exposure alters peripheral vestibular structures and physiology” “These data suggest that a single intense noise exposure may impact synaptic function in calyx-only terminals in the striolar region of the sacculus.” [Saccule is one of the vestibular organs]

With the sun’s UV rays it’s customary to consider the impact on inanimate surfaces, BUT also on the skin. However with sonic boom, noise there seems to be only a consideration of the impact on inanimate objects aside from the use of DNL metrics which dilute away the short-duration massive acoustic energy.

Focused Sonic Booms pose even greater risk for hearing and vestibular damage

It’s acknowledged that **focused sonic booms can be 2- 5 times greater overpressure** but there is no mention of the decibel levels. As noted above a single intense exposure can cause damage and these may be above OSHA and NIOSH’s impulse noise ceiling.

Additionally I will make the reasonable assumption that the sonic boom PSF data given assumes constant acceleration, flight in a straight line, which of course are both unrealistic and inconsistent with real world combat environment training style.

The sonic boom PSF noise does not say at what angle the plane is to generate those noise values, as that impact the levels.

The data on structures done by the military are bias. Additionally, they are vary vague because the word “structure” can emphases different type of structures and we don’t know what kind of structures were used in the testing? Different materials can respond differently to overpressures, and there was a very brief and vague touch on that only rather than an in-depth serious analysis. Also it focuses on 2 PSF cutoff when that is unreasonable to assume for military sonic

booms. **It's also unreasonable to assume people's homes especially in these rural communities are in "good condition"—a term that isn't even defined nor told to us what percentage of homes in these rural communities would even fall under that standard?** The rural areas of Cochise County have a lot of unique builds, mobile and portable homes, and the effects could be different but no analysis on that.
"Sonic boom intensity varies upward or downward from the values in **Table 7.2-1** for aircraft executing maneuvers while flying at supersonic speeds. Plotkin (1990) noted that aircraft maneuvers may create "focus booms" with overpressures 2 to 5 times the magnitude of steady state sonic booms. Due to the many variables involved in the training use of the existing and proposed MOAs/ATCAAs, it is impossible to predict when and where sonic booms or focus booms may occur. "-DEIS Appendix Sonic boom section

Nationwide geographic cumulative impact on availability of quiet places
The existing military airspaces combined with FAA policies for civilian flights leave no where to escape aviation noise pollution, Also, they make it nearly impossible to find areas with low-level civilian aviation noise pollution and simultaneously outside of military training airspace—these areas are largely public land or huge parcels (500+ acres each) owned by corporations (mining, pipelines, etc.), huge agricultural businesses, etc. Effectively, this makes it nearly impossible to find very low aviation pollution noise, and overall noise pollution (i.e. mining companies owning land in those areas) areas to live in.

These factors should have and should be considered when devising or altering any airspaces, including military airspace.

"

The "no change in noise"claims for areas are false
-They don't consider sound frequency it's been shown equal sound frequencies at same db cause vestibular damage at low frequencies (https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3387207/) . Also if this conclusion was based on DNL it's a false analogy because DNL metric dilutes the impacts. **The correct wording would be "no change in DNL" which is markedly different than "no change in noise."** I have already provided evidence for how poor DNL is above.

Increased short-term noise when multiple aircraft flying together:
The DEIS needs to disclose the increased noise values under the common occurrence when multiple fighter jets are flying together compared to single alone values which are likely what is in the DEIS.

More shortcomings on noise data in DEIS:

-No Spectrum analysis. As I just noted above sound frequency-matters when it comes to noise-induced vestibular damage (https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3387207/). Additionally sound frequency matters when it comes too soundproofing capability. It also matters when it comes to how far a noise travels and how easily it penetrates structures.

-There should be a section to discuss how often the noise will be audible inside a home, particularly the types of homes that are common in the rural areas such as mobile homes. And, to what level the noise will be audible in the home.

-Given the newer findings on noise-induced vestibular damage, a lot of the older noise studies may not be reliable, especially if they did not do an in-depth analysis of potential vestibular loss. So citing older studies should be scrutinized to a greater degree, and cross-reference with newer science shown in newer studies.

Various chemical pollutants

What are the air concentrations of potential **toxic pollutants from the fuel or exhaust**, such as **perchlorates, other suspect organic compounds**, and elements-including but not limited to during unusual events such as fuel dumping or fuel dumping fallout that falls further than usual?

Perchlorate in food/water is a concern and already happening: https://www.usatoday.com/story/news/health/2024/08/15/consumer-reports-rocket-fuel-chemical-perchlorate-food-water/74783445007/

Fluorocarbons/PFAs

DEIS does not disclose the levels of fluorocarbons to be released over civilians. It notes that flares contain Teflon and some other fluorocarbon polymer. It also notes that the flares are heated, I believe to 2000F. It's noted from numerous sources that when Teflon is heated it can convert to PFAs. It's reasonable to wonder if the heat can also degrade the polymer into monomer units? Given how toxic PFAs are, it's imperative to conduct real-world tests under the same conductions these flares are released to assess the air levels, soil levels, groundwater levels, and levels in tissues of livestock and wild animals, and compare to areas where flares aren't released and no other known PFAs contamination nearby.

See: https://www.epa.gov/pfas

“PA is considering removing from the inert ingredient list the chemical polytetrafluoroethylene (CAS No. 9002-84-0), also known as Teflon®.”

https://www.federalregister.gov/documents/2024/02/28/2024-04059/pesticides-proposed-removal-of-polytetrafluoroethylene-from-list-of-approved-inert-ingredients-for#:~:text=EPA%20is%20considering%20removing%20from,to%20no%20longer%20contain%20polytetrafluoroethylene.

Other air quality concerns regrading flares:

If there was a fire at a chemical plant that houses fluorocarbons, such as Teflon, the neighbors likely would be told to evacuate to avoid the fumes, or be alerted about the potential health ramifications, but when it comes to releasing these fluorocarbons from heating flares it’s somehow completely OK and not even remotely considered a health threat—in fact not even acknowledged in the DEIS. Why is this?

It’s acknowledged that air quality after fireworks is bad, and concern has been raised over this. However, don’t the flares or other aspects of the sorties release similar chemicals such as perchlorate, and other potentially toxic substances. Why is that for fireworks that happen only a few times a year the air quality health concerns make the news, but for flares that can happen every day over civilians, there is not really much if any talk about the health impacts and air quality? Why no graphs of particulate matter, organic compounds, VOCs, and metals that might be released?

As an example this is a study with a chart on perchlorate release into the environment from fireworks. https://www.sciencedirect.com/science/article/abs/pii/S0269749119307900 or https://www.sciencedirect.com/science/article/abs/pii/S1352231010010277

General news even talking about it: https://www.foxweather.com/lifestyle/america-independence-day-air-pollution-map

Lack of transparency on existing low-level flight routes

The DEIS often fails to mention the existence of a large amount of low-level Military Training Routes (MTRs) where sub-1000' AGL flight, including 100' AGL flight are already authorized, misleading the public into thinking the military is lacking this kind of airspace and that the only airspaces in that interactive map you have linked on the project website only shows MOAs involved in the project —this causes the public to exaggerate the need for the Air Forces claim to need more sub-1000' AGL training airspace—more than they would if the Air Force was fully transparent about entirety of the existing training airspace (e.g. MTRs) —not just the airspace under review in this project. While the MTRs may be mentioned here and there, they are omitted in contexts which are important in the public knowing the existence or lack-of low-level training airspace, such as that interactive map, and the diagrams on the project website for each group of under-review airspaces.

The totality of existing airspace especially existing low-level training airspaces (e.g. MTRs) is relevant in assessing the claim that the Air Force needs even more, and also is relevant to the public to assess whether they should be willing to sacrifice their peace and quiet and environment for this cause. But the DEIS does not allow for this.

Examples are numerous but some notable ones include diagram on pages:
3-125: Pictorial misleads since doesn't include ample existing MTR sub-1000' AGL training airspace
3-1-3:Pictorial also misleads by not showing huge amounts of 100' AGL training airspace over than same land as the Tombstone MOAs

I think there might have been one part that said 100' not allowed in tombstone MOAs. If so that's misleading again because there is huge military training route that runs over the same shared ground as Tombstone MOA—I think it's around 25 miles side too.

"Sorties" terminology is vague
Sorties being defined as takeoff, mission, then landing—doesn't give the time-in-flight or flight hours. It could be 1 hour or 6 hours. So it allows hiding of the flight hours, hiding of the number of low passes over a region. It would be more descriptive to mention flight hours of audible noise over any region, and total flight hours, and total number of planes at any given hour.

They use "flight hours" in describing each base in **Table 1.2-2, but when describing individual MOA impact they do not mention flight hours—instead they**

Mention number of "sorties.' The issue is that sorties can vary on their impact, on their loudness, on their time length, and on he quality of noise (e.g. C130 that can travel very far, versus low flying pass that might not travel as far) which doesn't allow for a good understanding of the impact.

Lack of transparency with "Other times by NOTAM"
"Other times by NOTAM" hides from the public the amount of activity there will be outside published hours. It's presentation misleads people to think it will be just once-in-a-while. However, I know first hand in Tombstone C MOA that at least most nights after published hours, that is between 21:00-0:600 UTC-7, there is what sounds like military aircraft noise, if not almost every night. So it comes off as just a technique to hide the impact. It's highly likely that if instead you said "24 hours, 7 days/week" then the comments would be much more adversarial toward this project. And so by using this phrase "other times by NOTAM" it causes the public to comment without knowing the real extent of the extended time periods of training.

The historical data of "Other times by NOTAM" for the past at least 5 years should be shown, as well as projected future data. Without this data, it's a complete lack of transparency and doesn't give the public any idea what to expect or enough base information to make an informed comment. By data, I mean the all the times of flight outside the published hours, number aircraft, number of flight hours, and number of hours each timespan outside published hours there are flights going on…in each MOA.

Also is the listed number of sorties just for published hours? Or does that include ATCAA and "other times by NOTAM?"

Regarding noise and sleep
"There is clear evidence that sleep disturbances are associated with health deterioration, and growing evidence that exposure to noise pollution, around-the-clock, negatively affects health, too."

https://pmc.ncbi.nlm.nih.gov/articles/PMC4608916/

And since the noise is very low-frequency it easily pierces walls and is audible inside.

Increased noise under particular environmental conditions:
Report should cover noise information when clouds, which are common during monsoon season but also existent other times, coupled with humid air, and also

under conditions where artificial clouds are created by aircraft releases. These conditions can increase the noise. Same should be done for noise while hiking in canyons. Again this is especially important here since the very high unweighted acoustic energy of these flights have potential to cause ear damage, and simply 1 or 2 decibel differences likely make a significant difference in this potential.

Increased noise with multiple aircraft flying together:
I forgot if I already mentioned this, but when there are multiple aircraft flying together, how much does the noise increase? As noted above since we are dealing with dangerous levels of noise knowing these little differences is important as the small marginal differences can be the difference between ear damage or not.

Fire-risk with non-fully discharged flares?
The fire risk of non-fully discharged flares on the ground should be thoroughly investigated. As an example, wildlife can come in contact with one and cause it to discharge, leading to a fire.

Flare burnout rate chart needs a distribution curve. What is the 95% in reference to? What about outliers? Also has empirical data under realistic conditions been used to verify the conjectures made?

Can the residue chaff or flare material cause wildfires to spread faster?
Flammability tests on both chaff and flare fallout to see if they would accelerate wild fires.

Chaff:
There should be a thorough investigation into the degradation of chaff into it's constants, such as crystalline silica, or any other potentially harmful compound.

If chaff is released at high temperatures, such as with flares or just a hot engine, it would be reasonable to assume it would more easily degrade. So any studies or modeling would have to take details like this into account for accuracy.

As chaff floats in the air for a long time— it will be exposed to a lot of direct sunlight, heat, and elements in the air column which can contribute to it's degradation leading to exposing crystalline silica and potentially other harmful substances.

There have been reports of people under high concentration of chaff, presumably near the release of it. There should be studies on the health effects of this.

The effect of chaff on soil health, such as pH and soil microbiology should be thoroughly investigated.

Other points:
-Specific potentially health impactful pollutants such as PFAs, other fluorocarbons, perchlorate, metals, VOCs, organic compounds (e.g. halogen containing) should be individually identified/disclosed and thoroughly investigated, due to their individual toxicity—as opposed to generalizing the pollution into PM2.5, PM10, VOCs, or other oxides which comparably are not as potentially toxic. Also ultrafine particle concentrations should be given as they have received publicity in the last several year as being potentially very toxic.

-CDNL misleads when used for short-term noise impacts such as sonic booms (e.g. pg. 3-24 of DEIS)) or other short-term subsonic noise. This is because you can take dangerous impulsive supersonic or subsonic noise levels and dilute their impact and health threat by using DNL—it both hides the health impacts and other impacts.

-Bottom of pg. 3-24 is incorrect regarding noise-induced hearing loss (NIHL) as it uses DNL. Even NIOSH and OSHA acknowledge via their recommended exposure levels (RELs) for workplace noise, that NIHL is a function of dB level and time, and as result they don't use DNL otherwise it would cover up potentially dangerous noise events that wouldn't adhere to their RELs, which is effectively what the DEIS is doing—covering up the potentially dangerous noise exposures by using DNL based metrics, or other metrics that dilute high amplitude noise exposures.

-Another example of noise metrics that downplay the impacts (e.g pg. 3-24) is L50, as it basically allows you to make enormous amounts of noise for 12 hours of the day, and then the other 12 hours the noise can be very low. It doesn't tell you to what degree above the base point noise—you could be 1 dB above or 100dB above, so it's extremely misleading and unsubstantial in its noise information.
-Pg. 3-30

—In multiple areas of the DEIS it mentions that experiencing 100 ft. AGL (and possibly other sub-1000'AGL overflights?) overflights would be relatively rare. I don't buy that, because I know in the Douglas, Az countryside there is a C130 that flys very low often and usually around the same vicinity. I've had it fly either directly over or very close to directly over a number of times. This also suggests that if they fly the same routes often that depending on specific locations, some people may experience far greater exposure than others—this should be thoroughly investigated and assessed for noise exposure. This also downplays the health impacts of just one exposure by writing it off as infrequent (alleging).

—On page 3-32 the number of very low overflights should be an absolute number not a percentage, because it is the absolute number that determines the noise injury risk and impact. For example if someone has 10,000 flights over them and 8% are 500 ft. Or lower that is still 800 flights at those very extreme noise levels. But if only 1000 flights, then it's 80 flights. So using percentage doesn't tell the noise impact risks. Also are these numbers per sortie or per flight pass? Because one sortie, such as C130 doing circles ,could result in numerous low levels passes and again would be extremely downplaying and misleading if you use sorties rather than the actual amount of flight passes.

-The noise data should combine the noise generated from Military Training Routes (MTRs) that overlapping horizontal dimensions (in the sense they are both airspace over the same ground, although have different vertical dimensions) or close to overlapping since the noise travels outside the airspaces. Otherwise it doesn't give the full impact.

-The high amplitude military noise proposed is inharmonious with the remote backcountry wilderness areas in these MOAs. It doesn't make sense to do it here as these levels of noise are higher amplitude and louder than what people in noisy cities are exposed to—and so effectively reduces the space available to move away from high amplitude artificial noise because now both the city/town ares and remote areas have these with the ongoing military training airspaces expanses, as well as presently, but it's just getting worse and worse.

-DEIS is arguably inconsistent with it's assertions about DNL. It says on page 3-23 "The DNL is an A-weighted cumulative noise metric that measures noise based on annual average daily aircraft operations. " which can suggest it shouldn't be used for short term high noise events yet the DEIS does use it for short term noise events such as sonic booms (CDNL), and I wouldn't be surprised if for short term subsonic noise events too.