

October 9, 2025

Kentucky Public Service Commission
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COMMISSION

Dear Commissioners,

I am asking your review of the following research on health and environmental concerns that is contradictory to the sworn testimony provided by Geenex employees during the evidentiary hearing on October 2, 2025. I am attaching over 12 studies which contradict their statements of no impact and their attempts to explain the harmful chemicals.

"When it becomes acceptable to destroy the planet to save the plant...there is no greater contradiction..."

There are various health concerns when dealing with Photovoltaic solar panels. The chemicals that are encapsulated inside of the panels is a deadly combination; thus, the requirement of hazardous waste provisions.

Multiple studies have linked underground and runoff water as flowing to Barren River Lake, Green River and the world-famous Mammoth Cave and other cave systems into Edmonson and Warren County. There is a host of underground waterways and rivers which flow to various cave systems. The studies from Wood Duck fail to acknowledge the potential for contamination and offer nothing for mitigation considerations. Everything is on the honor systems, "If" they find anything.

The project will destroy over 449.37 of acres of woodland which is 21.3% of the project area (Source: Critical Issues Analysis Wood Duck Solar Project by Stantec, page 3-1 dated 11/27/2022)

The noise and heat and insertion of 2,300 fenced acres will relocate habitat and destroy natural trees, flowers and grasses. In a community that is known for natural landscape and farming, this seems contradictory.

Please refer to the attached letter from the KY Energy and Environment Cabinet dated 5/12/2022 which states "your project does pose a concern at this time." Further evaluation is needed.

Wood Duck identified the make and model of the solar panel they are intending to use in their decommissioning plan (See Exhibit I, section 2.2, page 4). It is made by Canadian Solar and is CS7N-MB-AG. Canadian Solar has a checkered past with lawsuits and human rights violations using child and slave labor.

I'm lucky to serve on an international security committee and was aware that Europe has a law that requires them to disclose "substances of very high concern." Therefore, the European installation guide for the same make and model states they use copper ribbons in the solar panels which are coated in lead. According to their installation manual, "... a release of, and exposure to lead can take place....lead may damage fertility or the unborn child, causes damage to organs through prolonged or repeated exposure, is very toxic to aquatic life with long lasting effects, may cause cancer... may cause harm to breast-fed children." I submitted the installation manual under a separate letter. Regardless that Geenex's experts say these are safe, the data states they are harmful.

There are various studies about the toxins and the impact of the chemicals inside of the panels. Since this is a relatively new product, there aren't many studies on health-related issues; however, we do know what the chemicals can cause. Specific health concerns include:

1. Contaminated ground water
2. Contaminated well water
3. Contaminated air quality
4. Increased heat combined with corn humidity
5. Increased heat discomfort for residents and animals
6. Increased eye strain and glare on county roads (refer to Glare study analysis in our SAR response)
7. Increased noise from the inverters (refer to Noise study analysis in our SAR response)
8. Increased heat from the inverters (refer to Noise study analysis in our SAR response)
9. Toxins from fires (refer to fire analysis)
10. Toxins from leakage
11. Toxins from breakage
12. Glass shards
13. Cancer
14. Respiratory illness
15. Fertility
16. Headaches
17. Electromagnetic fields
18. Dust and allergies from construction

Recent research:

"A review of Safety ,Health and Environmental (SHE) issues of solar energy system" by M.M. Amana and others at the University of Malaya, April 2014.

“Toxic chemical content in solar panel manufacturing: Different chemicals are used in manufacturing of solar panels, particularly during extraction of solar cell. For example, Cadmium (Cd) is used in cadmium telluride based thin film solar cells as a semiconductor material to convert solar energy into electric energy which is highly toxic element.

The National Institute of Occupational Safety and Health (NIOSH) considers cadmium dust and vapors as carcinogens (causing cancer). Similarly, many hazardous chemicals are used as solvents to clean dust and dirt from the solar panels. European Union has initially banded Cd, Pb, Hg and other toxic compounds as per the regulation of the Restriction of Hazardous Substance Directive.

Table 11
Safety, Health and Environmental (SHE) impact from the toxic compounds [78,80,125–127].

Toxic Compounds	Purpose	Safety, health and environmental impact
Ammonia (NH ₃)	To produce anti-reflective coatings for solar PV modules.	Skin irritation, eyes irritation, throat problem, lungs problems, mouth and stomach burns.
Arsenic (As)	Used in GaAs solar PV cells, resulted from the decomposition of GaAs	Heart beat problems, throat infection, lung cancer, nausea, vomiting, reduced blood cells, skin darkening, red spot on skin, liver problem, etching in hands and feet.
Silicon (Si)	Used as a PV semiconductor material	Crystalline Si causes respiratory problems, irritating skin and eyes, lung and mucus problems
Lead (Pb)	To wire, solder photovoltaic electrical components.	Damages nervous system, weakness in bones, can also cause anaemia, high level exposure resulting in miscarriage for pregnant woman, damages the brain and kidneys, highly carcinogen element.
Nitric acid (HNO ₃)	To clean wafers and reactors, remove dopants.	Potential cause for chemical burns.
Sulfur hexafluoride (SF ₆)	Used to etch semiconductors and clean reactors in PV manufacturing.	The most powerful greenhouse gas known.
Cadmium (Cd)	Cd is used in cadmium telluride based solar cells as a semiconductor to convert solar energy into electricity.	Cd dust and vapours are highly toxic and considered as carcinogens. Also effect the respiratory system, kidneys and blood cells and can cause prostate, diarrhoea, chest tighten and lung cancer.
Hydrogen (H ₂)	Used in manufacturing amorphous-Si solar cells.	Highly explosive.
Hexavalent Chromium (Cr-VI)	Used in screw, solar chassis board and as a coating material in solar panel to absorb solar radiation.	Cr is a carcinogenic element, means causes cancer.
Polybrominated biphenyls (PBBs) and brominated diphenylethers (PBDEs)	Used in circuit boards and solar panel inverters	Recognized as toxic and carcinogenic and are described as endocrine disrupters.
Acetone	These solvents are used to clean microscopic dirt and dust off of chips.	Eyes and nose irritation, throat infection, kidney and liver problem, nerve damage, birth defects, sexual problems including lowered ability to reproduce males.
Iso-propanol	To clean microscopic dust and dirt from solar chips.	Vomiting, Eyes irritation, depression, dermatitis, nausea, unconsciousness, respiratory failure, death or coma.
Toulene		Headaches, hearing loss, confusion, memory loss, pregnancy problems, retarded growth.
Xylene		Skin irritation, eye irritation, nose infection, throat and breathing problems, pregnancy problems, liver and kidneys infection.
1,1,1-Trichloroethane		Dizziness and loss of mind, reduced blood pressure, unconsciousness, stop heart bearing.
Hydrochloric acid (HCl)	To produce electrical grade silicon, clean and etch semiconductors	Skin problem, eyes and nose infection, respiratory problem, food digestion, mouth and throat infection, respiratory depression.

Second study:

“Assessing the environmental health and safety risks of solar energy production” by Alex Olanrewaju Adekanmbi and others, printed in the World Journal of Biology Pharmacy and Health Sciences, 2024, 17(02), 225–2313.

This article explains the risks that workers face when assembling the solar panels. Obviously what goes in, must come out.

Safety Risks in Solar Energy Production Occupational health and safety hazards in solar energy production encompass various stages, from manufacturing to installation, maintenance, and decommissioning. In manufacturing facilities, **workers face exposure to hazardous materials such as lead and cadmium, necessitating stringent safety protocols** (Ndejjo et al., 2015; Ibekwe et al., 2024).

Similarly, during installation and maintenance, the risks of falls, working at heights, and electrical hazards are prevalent, along with other workplace accidents (Wright & Norval, 2021; Odeleye et al., 2018).

Furthermore, decommissioning and disposal pose risks associated with dismantling solar systems and the proper disposal or recycling of materials (Schulte et al., 2013; Etukudoh et al., 2024). The rapid growth of solar energy production, as well as other renewable energy sources, has led to an increased focus on identifying and eliminating hazards to workers, emphasizing the importance of occupational safety and health in these industries (Schulte et al., 2016; Ukoba et al., 2018). **Legislation needs to recognize solar ultraviolet radiation 226 World Journal of Biology Pharmacy and Health Sciences, 2024, 17(02), 225–231 exposure as an occupational health hazard**, with corresponding sun safety guidelines and training provided for employers and employees (Wright & Norval, 2021). Additionally, it is crucial to address PPE supply gaps, job-related pressures, and complacency in adhering to mitigation measures to ensure the occupational health and safety of workers (Ndejjo et al., 2015; Ezeigweneme et al., 2024). Moreover, the occupational safety and health challenges in solar energy production are not limited to physical hazards.

Vulnerable workforces, such as immigrant workers, require regulatory protections that are at least equivalent to those provided to workers in other industries (Liebman et al., 2013; Ilojanyanya et al., 2024). Furthermore, the awareness of occupational hazards among workers, including those in the solar energy sector, is essential to mitigate risks and enhance productivity (Kattof et al., 2022; Marahatta et al., 2018).

In conclusion, the occupational health and safety hazards in solar energy production are multifaceted, encompassing physical risks, **exposure to hazardous materials**, and the need for stringent safety protocols throughout the various stages of production. Legislative recognition of these hazards, coupled with comprehensive training, supply of personal protective equipment,

and heightened awareness among workers, is crucial to ensuring a safe working environment in the solar energy industry.

Third Study:

“The photovoltaic industry on the path to a sustainable future — Environmental and occupational health issues” by Bouchra Bakhiya and others in the Department of Environmental and Occupational Health, School of Public Health, University of Montreal, January 2014.

This article examines some of the materials used in the building of the solar panels and the process to decommission panels at the end-of-life cycle. Photovoltaic waste is nowadays considered e-waste and there are concerns with manufacturing waste such as broken and/or defective panels and production process waste.

“Components such as inverters, mounting structures and cabling are poorly documented (researched), apart from inverters electronics compounds and aluminum frame which are associated with a substantial level of toxicity risk that contribute significantly to the global PV system environmental and health impacts.” They use potential toxic raw materials (such as cadmium sulfide) and processes (such as indium or zinc based-deposition.)

“A wide range of potential toxic chemicals are used, generated or manipulated in the PV industry, routinely or accidentally. Potential exposure can occur through dust, smoke and/or vapor inhalation but also through ingestion and eye contact. “

“Workers are exposed to arsenic, bromine-containing flame retardants, cadmium and hexavalent chromium. Recycling creates exposure to lead, arsenic, strong acid and dioxins.” Toxic potential of PV waste in case of landfilling and/or incineration not clarified, although possible leaching of metals, Ag: silver, Al: Aluminum, Cd: Cadmium, CdTe: cadmium telluride, Co: cobalt, CrVI: hexavalent chromium, Pb: lead, PBDE: polybrominated diphenyl ethers,”

“The toxic effects of several chemicals, in particular telluride, cad, iu, telluride, gallium and germanium are still under study. The PV industry interest toward engineered nanomaterials could raise occupational safety and health concerns despite their anticipated technological and economical contribution to “green and sustainable growth>” Indeed, the toxicology of these nanomaterials is still not fully understood, and some animal studies show pulmonary toxicity.”

“Indium phosphide is classified as probably carcinogenic to humans and occupational exposure to indium compounds is associated with lung diseases, from pulmonary alveolar proteinosis to emphysema and eventually death.”

Table 7

Main hazardous substances associated to PV modules manufacturing considering their principal usage and hazardous properties

Chemical substance ^a	Principal usage	Hazardous properties ^b			
		A	C	I	F
Ammonia	Anti-reflective coating				
Argon gas	Thin film deposition				
Boron trifluoride	Dopant				
Diborane	a-Si dopant				
Helium gas	Thin film deposition				
Hydrochloric acid	x-Si raw material Etching and cleaning				
Hydrofluoric acid	x-Si cleaning and etching				
Hydrogen gas	a-Si deposition				
Hydrogen selenide	CIS sputtering				
Hydrogen sulfide	CIS sputtering				
Methane gas	a-Si and GaAs manufacturing				
Nitrogen trifluoride	Silicon wafer plasma etching and a-Si PECVP chamber cleaning				
Phosphine gas	Thin film dopant				
Phosphorous oxychloride	x-Si dopant				
Selenium	CIS/CIGS raw material				
Silane gas	Intermediate product during x-Si production – a-Si deposition				
Silicon tetrachloride (tetrachlorosilane)	x-Si and a-Si deposition				
Strong bases (e.g. soda, potash)	Cleaning				
Tellurium	CdTe and CIS raw material				
Trichlorosilane	x-Si and a-Si deposition				

A: asphyxiant; C: corrosive; I: irritating; F: flammable; E: explosive; CdTe: cadmium telluride; a-Si: Amorphous silicon; x-Si: crystalline silicon; CIS: copper indium selenide; CIGS: copper indium gallium selenide; GaAs: gallium arsenide; PV: photovoltaic.

^aExtracted from: Baldwin and Gerami (2011), EPRI (2003), Ferrazza (2013), Fthenakis (2013), Fthenakis et al. (2006), INRS (2013a), Miquel (2009), Ngai (2012), and Pham et al. (2013).

Fourth Study:

Additionally, the California Department of Toxic Substances Control (DTSC) has specific requirements for the disposal of solar panels. <https://dtsc.ca.gov/solar-panel-faqs/#easy-faq-363959>

"Analytical test results, using federal and California specific toxicity test procedures, show that older PV modules have more potential for the hazardous characteristic of toxicity due to the use of substances of concern, such as lead in solders and hexavalent chromium in coatings. Cadmium telluride (CdTe) modules could have hazardous characteristic of toxicity due to the cadmium; Gallium arsenide (GaAs) modules due to arsenic; Thin film modules, such as copper indium gallium selenide (CIS/CIGS) modules due to copper and/or selenium.

Fifth Study: "The Photovoltaic Heat Island Effect: Larger Solar power plants increase local temperatures" by Greg A. Barron-Gafford and others, in Scientific Reports, May 26, 2016

"Transitions to Photovoltaic (PV) plants alter the way that incoming energy is reflected back to the atmosphere or absorbed, stored and reradiated because PV plants change the albedo, vegetation, and structure of the terrain. We found temperatures over a PV plant were regularly 3-4 degrees C warmer than wildlands at night which is in direct contrast to other studies based on models that suggested the PV systems should decrease ambient temperatures."

The conversion of Celsius to Fahrenheit is 37.4 - 39.2 degree Fahrenheit warmer. That is substantial.

"A growing concern that remains understudied is whether or not PV installations cause a "heat island" (PVHI) effect that warms surrounding area, thereby potentially influencing wildlife habitat, ecosystem function in wildlands and human health and even home values in residential areas."

"PV models are thin and have little heat capacity per unit area, but PV modules emit thermal radiation both up and down and this is particularly significant during the day when PV modules are often 20 degrees Celsius warmer than ambient temperatures". Conversion to Fahrenheit is 69 degrees WARMER.

PV modules delay the cooling of ambient temperatures in the evening, yielding the most significant difference in overnight temperatures across all seasons."

The research further states that PV creates concerns over potential reduction in real estate value and health issues tied to "Human Thermal Comfort (HTC).

Sixth Article: Does Solar have a dark side? Solar impacts on rural landscapes and the family farm by Alice Jones Webb, February 6, 2024.

This article states, “Solar installations on the scale needed to supply power grids are massive, transforming pastoral vistas into industrialized landscapes of metal and glass surrounded by security fences. These sprawling arrays can alter everything from sun exposure to surface temperatures which can have vast and unexpected impacts on plants and animals and even alter the area’s microbiome.”

“The dark surfaces of solar panels absorb most of the light and heat that reaches them. However, only about 15% of incoming energy is converted to electricity. The rest is returned to the environment as heat. Because the panels are so much darker than the surrounding vegetation, large swathes of solar fields will absorb and emit heat at higher rates, which can have unknown consequences on the surrounding environment.”

According to Jeffrey Lovich, a research ecologist with the U.S. Geological Survey, “Solar panels can incinerate insects and burn the feathers of birds that fly through.” Cicadas and Lightning bugs will disappear.

“Solar panels harbor a cocktail of toxic chemicals including cadmium compounds, silicon tetrachloride, hexafluoroethane and lead. There is concern that a panel can leak these substances if damaged.”

“If you were to take a field out of solar, the infrastructure that was put in the ground to support the panels, the concrete, the galvanized metal, these things sit on, they’re going to leach zinc into the ground. The galvanized metal under the surface can result in high readings of zinc in soil samples. Zinc may be essential micronutrient, but if too much leaches into the soil, there’s no way of getting it out.”

The article supports the theory of sacrifice zones. “..the push to go solar is strong, especially in economically disadvantaged areas...vast majority of new solar facilities are being built in rural communities where land is more plentiful than money and the locals regularly struggle to pay bills.” Sacrifice zones in the context of renewable energy, like solar panels, refers to areas where the transition to renewable energy causes disproportionate environmental, health consequences and social harm, often affecting marginalized communities. This can involve land use, habitat loss, health risks, pollution from manufacturing and other issues.

The concept of sacrifice zones highlights the unequal distribution of benefits and harms associated with the energy transition, where some communities bear the brunt of environmental and health impacts while others benefit from the “green” economy.

Personal note: At no time was the community included in the decision-making processes and many did not receive any compensation for negative impacts. The solar elites who function as land brokers and assemble multiple farms into large parcels for developers speak of using mechanisms ranging from social ties, to persuasion to subtle and no-so-subtle threats and coercion to get farmers to sign leases or sell their land. Many promises are made, but few are kept.

Seventh Article: Air and Climate Report, Case Study: Mammoth Cave National Park, National Parks Conservatism Association.

“Despite its reputation as one of the most beautiful autumn destinations for its foliage and dramatic views, polluting industrial facilities across Kentucky and the surrounding regions from the southeast to the Ohio River Valley continue to threaten Mammoth Cave’s biodiversity, vistas and visitor’s health.”

Mammoth Cave is threatened by coal-fired power plants, elevated pollutants, pollution, and airborne contaminants. Local residents suffer from asthma, bronchitis and other respiratory illnesses. Mammoth Cave faces significant concern levels for harm to nature due to nitrogen and sulfur deposition in soil and water. The park reached unsatisfactory levels in the categories of Hazy Skies and Unhealthy Air. “Climate change negatively affects Mammoth Cave through introduction and proliferation of invasive species that disrupt the ecological balance and compromise the health of its habitat.

There is no date on the report. However, as Kentuckians, we need to do what we can to ensure a development in our county doesn’t negatively impact the cave and we believe the Wood Duck Solar project will do just that. Please deny this project and protect Mammoth Cave.

Eighth Article: “Co-exposures of acid rain and ZnO (zinc oxide) nanoparticles accelerate decomposition of aquatic leaf litter.” By Jingjing Du and others, Journal of Hazardous Materials, March 2022.

This article states that acid rain and ZnO nanoparticles accelerate leaf decomposition. The pattern of acid rain is dependent on the ratio of acid rain and nitrate, which change may affect the dissolution activity of dull heavy metals in the aquatic environment and further complicate the ongoing challenge of ecosystem stability and increase risks. **KEY:** “When this important ecological process is simultaneously exposed to acid rain and other environmental stressors such as metallic nanoparticles, whether the mixed acid rain can change the ionic strength of stream water and affect the dissolution of these dull metals and therefore lead to combined effects on plant litter decomposition should be addressed.” It has been documented for years that the Mammoth Cave

area has acid rain. This will cause the metal used in the solar project to rust much quicker, creating ZnO and killing aquatic life.

Kentucky urged to curb air pollution that makes Mammoth Cave one of the haziest

national parks BY: [LIAM NIEMEYER](#) - AUGUST 1, 2024 5:50 AM

Canoeing the Green River is one of Mammoth Cave National Park's many above ground attractions. (National Park Service)

Mammoth Cave National Park is famous for what's below the ground, featuring the world's longest explored cave system with hundreds of miles of passages and a unique ecosystem of fish, insects, worms and crustaceans. But it's what's happening in the air above the cave system that has Kentucky environmentalists concerned.



Mammoth Cave is [one of the country's haziest national parks](#), says a national group dedicated to conserving the parks. Environmental groups say a Kentucky plan being drafted for controlling the air pollution that causes haze falls short — criticisms state officials largely refute. Milkweed is one of the ozone sensitive species found at Mammoth Cave National Park. (National Park Service)

Haze is [tiny, airborne particulate matter](#) that can obscure outdoor visibility. It can be created from natural sources such as wildfires but largely comes from man-made sources, such as emissions from motor vehicles and power plants. This pollution can impact people's health by aggravating asthma, reducing lung function and leading to heart problems. It can also [negatively impact wildlife](#).

“We’re seeing more of these haze pollutants depositing into the soil and the water and impacting wildlife, because they eat a lot of things that are in the soil and in the water,” said Natalie Levine, the senior manager for clean air and climate programs at the National Parks Conservation Association (NPCA), the group that analyzed haze pollution in national parks.

According to the NPCA, the large majority of that haze drifting into national parks is man-made. And at Mammoth Cave, more than 70% of pollution contributing to haze is coming from electricity generation — specifically coal-fired power plants.

Smokestack emissions from coal-fired power plants contain toxic gasses sulfur dioxide and nitrogen dioxide, which can react with water and other atmospheric gasses to become acid rain that acidifies water and soil and harms the wildlife that rely on them. Excess nitrogen and sulfur from these gasses can be deposited into the soil and water through acid rain or by settling onto surfaces through the air, potentially killing and inhibiting the growth of trees and other plants.

Hikers on the Bluffs Trail at Mammoth Cave National Park. The air pollution that causes haze can harm human health, aggravating asthma, reducing lung function and leading to heart problems. (National Park Service)

“We are concerned about our national parks. We’re concerned about their biodiversity. We’re concerned about hazy skies and giving people the best outdoor experience possible. But we’re really talking about the health of the communities as well,” said Julia Finch, the director of the Sierra Club’s Kentucky chapter.

A spokesperson for Kentucky’s environmental protection cabinet, however, says its efforts to reduce haze “are significantly reducing emissions” and that air quality around the national park is better than national standards.

John Mura, a spokesperson for the Kentucky Energy and Environment Cabinet that houses the Division for Air Quality, in a statement said the state is committed to working with federal agencies “and other interested parties to ensure the cleanest air quality possible for our citizens by understanding and addressing the emission sources that are contributing to visibility issues at Mammoth Cave National Park.”

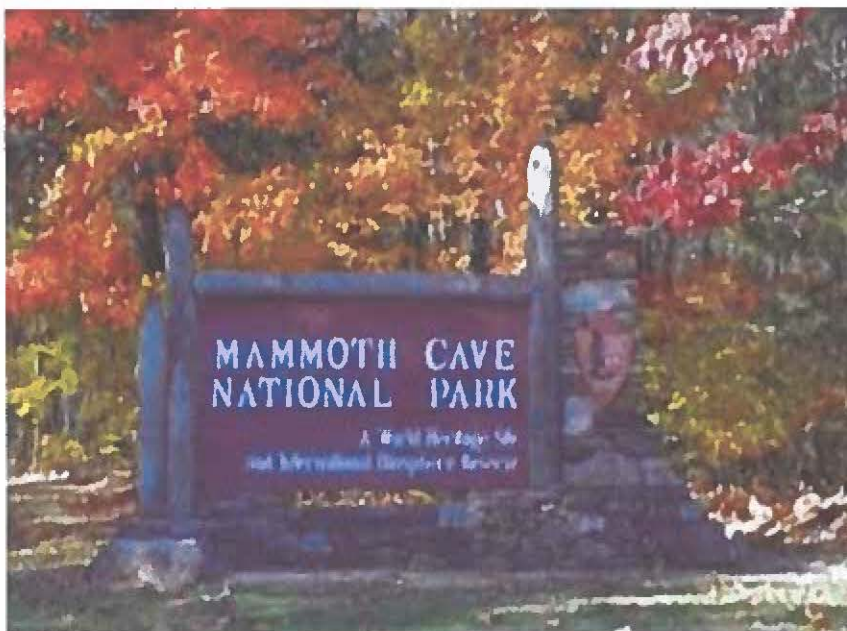
Slow improvements in haze

Haze protections for national parks date back to the establishment of the Clean Air Act in the 1960s and the additions and amendments added to it over the decades,

In 1999, the U.S. Environmental Protection Agency (EPA), empowered through the Clean Air Act, issued new regulations requiring states to develop regional plans to reduce haze in national parks and control the pollution sources contributing to it. Such regional plans, for example, could require coal-fired power plants to install smokestack scrubbers or controls to filter out sulfur dioxide and nitrogen dioxide emissions. The long-term goal of the plans is to return national parks to their original natural visibility by 2064.

An entrance to Mammoth Cave National Park (National Park Service)

But there have been a number of delays in getting states to submit these plans, Kentucky included. The EPA required the first version of these plans to be submitted by the end of 2007; Kentucky did, but [37 states did not](#).



Progress reports on how states are meeting goals set in their haze plans are due every five years, and new versions of the regional haze plans are due every 10 years.

The EPA set another deadline for states to submit their second version of regional haze plans in July 2021, a deadline that Kentucky and [14 other states did not meet](#). Kentucky is now trying to submit a new draft haze plan for the EPA to consider by a new deadline of Sept. 29 under the potential threat the EPA could step in and create its own haze plan for Kentucky.

State officials say Kentucky's first regional plan has decreased the state's sulfur dioxide emissions by 310,047 tons since 2008, and that air quality at the park is better than national standards.

Data from the National Park Service (NPS) does show visibility and the impacts of acid rain and ozone at the park have improved in a little over a decade since the state's first haze plan was submitted, though acid rain and ozone are still impacting wildlife and human health.

Median visibility at the park only reached a "fair" classification as of 2021 after having "poor" visibility since 2009, according to NPS data. The amount of sulfur and nitrogen deposited into the park's soil and water every year through acid rain and the air has decreased, though sulfur levels have decreased much more significantly than nitrogen levels.

The levels of ozone, a reactive gas largely created from emissions from power plants and cars that can harm human health, have also decreased since 2009. Ozone impacts to vegetation in the park are rated at a "good" level but remain as only "fair" for human health, according to the NPS.

Environmentalists say more should be done

Even with that progress, environmental groups including the Kentucky Chapter of the Sierra Club and the Kentucky Resources Council, say the updated haze plan Kentucky is considering doesn't do nearly enough to reduce air pollution impacting the park through haze and acid rain.

These environmental groups say only two coal-fired power plants — the Tennessee Valley Authority's Shawnee Fossil Plant in McCracken County and the Big Rivers Electric Corporation's D.B. Wilson Generating Station — were analyzed by the state as potential sources of haze pollution in the draft plan when over a dozen more pollution sources including other power plants and industry are also contributing to the haze.

Among the two power plants analyzed, these groups say, the state decided to not require any additional emissions controls to reduce nitrogen dioxide and sulfur dioxide emissions from the plants. The groups say state officials also only accounted for controlling sulfur dioxide emissions and not nitrogen dioxide emissions, which also can create haze.

“In the excluded list were five coal plants and nine other industrial facilities, including those with aluminum and metal smelter operations, oil and gas operations, and lime and cement operations,” said Audrey Ernstberger, a lobbyist with the Kentucky Resources Council at a public hearing on the draft haze plan last month.



TVA's Shawnee Fossil Plant is located about 10 miles northwest of Paducah at the confluence of the Ohio and Cumberland rivers. (TVA)

Ernstberger said the result, according to KRC's analysis, is that more than 82,000 tons of haze pollution will still

be released under the draft plan.

In Kentucky's draft plan, state officials write that because the electric utility Big Rivers Electric Corp. had installed a device in November 2022 to control sulfur dioxide at its Wilson coal-fired power plant, a deeper analysis into potential emissions controls wasn't needed.

Officials also write that the emission levels of nitrogen dioxide coming from the Wilson and Shawnee plants didn't exceed "screening thresholds" in the state's modeling, so officials "did not perform any reasonable progress analyses" for nitrogen dioxide emissions.

For the Shawnee Fossil Plant, Mura said the state worked with the Tennessee Valley Authority to modify its state air permit to limit sulfur dioxide from the plant to 8,208 tons per year starting in 2028. State officials chose that limit following a deeper "four-factor" analysis conducted into potential emission controls for the coal-fired plant.

When asked by the Lantern why the state chose only the Wilson and Shawnee plants to analyze for haze pollution, Mura said the state used modeling to determine the plants were "significantly impacting Mammoth Cave National Park and that limiting SO₂ emissions at these facilities would have the greatest impact in improving visibility in the region."

If Kentucky meets the September deadline for submitting a haze plan, the EPA could approve the plan as is, ask the state to make revisions or step in and make its own plan. A federal judge [last month signed a consent decree](#) directing the EPA to speed up action on haze plans submitted by 32 other states.

Hilary Lambert, a former Lexington resident who led a New York-based water protection nonprofit, said at the July public hearing she owns a cabin in Green County less than 50 miles east of Mammoth Cave National Park. She echoed what she wrote in a [Louisville Courier-Journal column](#) saying the state needs to do more to curb pollution and ensure compliance with state and federal regulations.

"It's the state's own, the commonwealth's only big national park, and it's a jewel for people to visit," Lambert said at the hearing. "Please get up to date and bring a number of businesses into compliance with the law to clean up the air for everybody." Mammoth Cave National Park is more than its famous cave system. (National Park Service)

Ninth Article: "Investigation of Corrosion-Resistant Materials for Security Fencing" by Richard G. Lamp, Department of Defense Corrosion Conference 2011.

"Traditional galvanized steel wire fencing can become severely corroded in just 5-7 years in coastal and tropical regions where the atmosphere is humid and laden with salt. Even conventional polyvinylchloride (PVC) coated galvanized steel fencing can corrode in severe environments. Military equipment, supplies, and buildings requiring controlled access need security fencing that is not compromised by corrosion. Besides fencing, traditional galvanized steel and painted steel guard and hand railings can also become severely corroded in a short time in coastal environments, and these pose safety hazards for personnel."

We must ensure that steel pieces are not coated with a zinc oxide primer and alkyd enamel topcoat due to rapid material degradation.

This research supports the findings of the 2 previous articles and the impact of acid rain in the Mammoth Cave area. There is no way the metal fences, posts, wire, and steel frames to hold the solar panels will not rust, creating zinc oxide which is deadly to crustaceans and aquatic life. The underground water systems will deliver the deadly cocktail to the cave. This project must be stopped.

Tenth Article: “Spontaneous glass breakage on solar panels on the rise” by Ryan Kennedy, PV Magazine, June 21, 2024

This article reports that solar panels are breaking due to the thinness of the panels. “It shows up as a small star-shaped mark that seems insignificant. But when extreme weather condition with very high or low temperatures cycle through, the severity of the damage is fully realized and suddenly a large crack is visible across the whole surface.”

The rise in breakage is likely due to the trend solar glass getting thinner over time, said Mike Pilliod from Central Tension who spoke at The National Renewable Energy Laboratory’s (NREL)’s 2024 PV Module Reliability Workshop. Any manufacturer can temper glass that is 3 mm, but under 3 mm, glass tempering is a difficult process. He said that as the glass gets thinner, it takes fewer defects to create strength limiting flaws in the glass. These flaws are actively being studied by NREL to understand some of the potential pitfalls of using thin glass in solar manufacturing.”

54% of all solar losses are attributed to hail damage.”

We cannot take this risk...spontaneous breakage, hail damage, lightning strikes – it is too risky. We must protect Mammoth Cave and all farms and residences in Barren County.

Eleventh Article: “Environmental impact of PV Power Systems” by Mladen Bosnjakovic and others, published in Sustainability 2023.

“Some of the most significant environmental impacts of PV solar power plants are related to land use, greenhouse emissions (GHG), water consumption, hazardous materials, visual impact and noise.” Land use refers to the amount and type of land occupied by a PV solar power plant which can affect the natural habitat and biodiversity of the area. Depending on the location, size and design of the PV power plant, land use impacts can vary significantly. Greenhouse emissions refer to the amount of carbon dioxide and other gases released in the atmosphere by PV power plant activities that can contribute to global warming and climate change. Water must be used for cleaning.”

“PV cells contain toxic materials such as cadmium or lead that can leach into soil or groundwater if damaged or disposed of. Some PV modules also use chemicals such as hydrofluoric acid or sulfuric acid for cleaning or etching, which can cause air or water pollution if released.”

This article references the potential fate and transport of leached metal contents from PV systems and estimated the risks to the environment and human health via dermal exposure and ingestion for subgroups of children and adults. Results showed that children were more at risk from lead. Children and adults are more at danger from exposure to metals like cadmium, lead,

indium, molybdenum and tellurium through the skin and soil ingestion. Exposure to contaminated soil results in an overall hazard. In every case, lead poses a serious cancer risk while other metals pose an acceptable non-cancer risk through groundwater exposure.”

“Solar modules that are disposed of in landfills after use have the greatest negative impact on the environment. The most harmful metals for health and environmental quality are PA6, cadmium, nickel, copper, lead and silver.”

Twelfth Article: “Does Galvanized Steel Rust? Lifespan, Protection Methods and Key Factors”
April 24, 2025 by HLC Metal Parts, www.hlc-metalparts.com

This article discusses the benefits to using galvanized steel because it is submerged in a bath of molten zinc. As the steel cools, a series of zinc-iron alloy layers form topped with pure zinc. This creates a powerful barrier that protects the underlying steel from harsh environmental conditions. However, zinc runoff may create environmental concerns and **ACID RAIN ACCELERATES ZINC CORROSION.**

“Moisture rich environments, especially those with high humidity or frequent acid rain can cause the zinc to corrode more rapidly. Acid rain contains sulfuric and nitric acids that react with the zinc, wearing away the protective barrier faster than in dry climates.”

“It is recommended that steel be cleaned with mild soap and water to remove dirt, dust, bird droppings and other debris which can trap moisture against the surface, accelerating corrosion.”

“Galvanized steel in contact with copper, brass or untreated steel can experience galvanic corrosion, especially in wet environments. Standing water accelerates corrosion-even on galvanized steel.”

We cannot introduce 204,525 metal frames, over 28,000 steel posts and over 30 miles of metal fence into this area of Barren County. We just can't do it. With all of the flooding and standing water, we just can't do this.

In conclusion, the chemicals that are encapsulated in a solar panel have the potential to leach and leak into the soil and groundwater at any time it is disturbed via a storm, hail, lightning, fire, malfunction, overheating, rodent damage, gunshot damage etc.

They are hazardous. This is why when they are damaged or decommissioned, the workers must wear haz mat suits. This is why the panels must be taken to specific sites to be recycled and for commercial solar panels there is often a cost associated with this service.

Mammoth Cave has expressed concerns over batteries and containments. While Wood Duck has told Mammoth Cave, there are no batteries, residents do not believe this to be true.

But, what is true, is that the underground waterways flow to Mammoth Cave and to the second largest spring in the cave and then to Green River. We cannot risk contamination of any type.

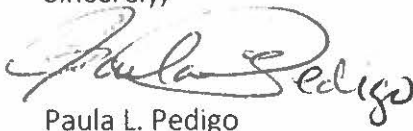
We have several reasons of concern which support Mammoth Cave's opposition to the project:

1. Batteries – Wood Duck has said “no batteries:”. We want this verified by an independent engineer and the owner of Geenex, Juergen Fehr. If there are any batteries, the project should be canceled. Immediately.
2. Toxins (as demonstrated in the scholarly research referenced above) from the solar panels can leak and leach into the ground and underground water systems.
3. Toxins and rust, zinc oxide, etc. from the metal posts, metal frames, metal wire, fence posts, etc. can create harmful chemicals which are deadly to crustaceans in the water and can pollute the underground waterways. The solar panels are held by metal/steel frames and posts which will rust. The chain link and “game” fence will rust. The rubber coated wires underground can deteriorate. The rubber coated wires above ground can be damaged by rodents and sunlight can deteriorate the plastic, causing it to break into small particles.
4. The panels are 90% glass and this creates the potential for glass shards to be deposited into the soil and carried in the water systems. The ground water can be polluted by the chemicals through flooding, run off, leaching and leaks and soil erosion. All of this can harm the underground waterways.
5. There will be chemicals needed to wash the solar panels to remove bird droppings, mold, pollen and dirt. This must be removed or the panels can over heat, leading to increase potential for fires.
6. Zinc Oxide is used as an anti-reflective treatment on top of the panels. This is deadly to crustaceans in water.
7. Concrete pads and concrete around posts can accelerate the development of rust which creates Zinc oxide which is deadly to crustaceans in water. The minutes from the Barren County Planning Commission reference poured concrete.

We cannot afford this risk for the health of our citizens, our children and the habitat in our beloved cave.

Thank you for your careful review of this research. Please do not let the testimony of an employee taint the facts and the research.

Sincerely,



Paula L. Pedigo

