IN THE UNITED STATES COURT OF APPEALS
FOR THE EIGHTH CIRCUIT

IOWA ENVIRONMENTAL COUNCIL and SIERRA CLUB, *Petitioners*, v. UNITED STATES ENVIRONMENTAL PROTECTION AGENCY; LEE ZELDIN, in his official capacity as Administrator, U.S. Environmental Protection Agency; and JIM MACY in his official capacity as Regional Administrator, Region 7, U.S. Environmental Protection Agency, *Respondents*.	)	Case No. 26-3374 MOTION TO SUPPLEMENT EMERGENCY MOTION FOR STAY PENDING DISPOSITION OF PETITION FOR REVIEW

MOTION TO SUPPLEMENT EMERGENCY MOTION FOR STAY PENDING DISPOSITION OF PETITION FOR REVIEW

Petitioners Iowa Environmental Council and Sierra Club, by and through undersigned counsel, respectfully move this Court for leave to file additional declarations in support of their Emergency Motion for Stay Pending Disposition of Petition for Review. Specifically, Petitioners seek leave to file the following affidavit and declarations, attached as Exhibit A:

1. Affidavit of Mark J. Thomas, PhD
2. Declaration of Dr. Ranajit Sahu, PhD
3. Declaration of Geoff Fruin, City Manager of the City of Iowa City

The declarations include factual attestations that support arguments made in the Motion for Stay, including: the inadequacy of public notice and information; challenges by subject matter experts to the accuracy of scientific claims relied upon by the Army and the Environmental Protection Agency, including whether a delay to allow judicial review would materially increase the hazard posed by the stored lead azide; and the lack of data to show that the permit conditions are adequate to protect human health and the environment from releases of hazardous waste constituents.

The declarations were unavailable when Petitioners filed the Emergency Motion, partly because of its emergency nature and partly because some respond to events that occurred after that filing. Undersigned counsel submits them as soon as practicable and before Respondents' opposition to Petitioners' Stay Motion has been filed. The declarations are material to the underlying matter, and Respondents will not be prejudiced because they corroborate facts and arguments already before the Court.

For the foregoing reasons, Petitioners respectfully request that the Court accept for filing the declarations attached as Exhibit A, and that they be considered as supplemental support for Petitioners' emergency motion.

Dated: November 22, 2026

Respectfully submitted,

/s/ *Thomas Cmar*
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Counsel for Petitioners Iowa Environmental Council and Sierra Club

CERTIFICATE OF COMPLIANCE

Pursuant to Federal Rules of Appellate Procedure 27 and 32(g)(1), the undersigned counsel for Petitioners certifies that this response complies with (1) the type-volume limitation of Federal Rule of Appellate Procedure 27(d)(2)(A), because it contains 565 words, and (2) the typeface and type-style requirements of Federal Rules of Appellate Procedure 27(d)(1)(E) and 32(a)(5)–(6), because it has been prepared using Microsoft Office Word for Office 365 and is set in Times New Roman font in size equivalent to 14 points or larger.

/s Thomas Cmar
Thomas Cmar

Counsel for Petitioners Iowa Environmental Council and Sierra Club

CERTIFICATE OF SERVICE

I certify that on November 22, 2026, this Motion to Supplement Emergency Motion to Stay Pending Disposition of Petition for Review was served on all parties via this Court's CM/ECF system.

/s Thomas Cmar
Thomas Cmar

Counsel for Petitioners Iowa Environmental Council and Sierra Club

EXHIBIT A

IN THE UNITED STATES COURT OF APPEALS
FOR THE EIGHTH CIRCUIT

IOWA ENVIRONMENTAL COUNCIL and SIERRA CLUB, Petitioners, v. UNITED STATES ENVIRONMENTAL PROTECTION AGENCY, et al., Respondents.	Case No. 26-3374 AFFIDAVIT OF MARK J. THOMAS, PH.D., IN SUPPORT OF PETITIONERS' EMERGENCY MOTION FOR STAY

STATE OF Iowa

COUNTY OF Des Moines County

I, Mark J. Thomas, being first duly sworn, depose and state as follows:

Identity and Qualifications

1. I am over eighteen years of age and competent to make this affidavit. I make it on personal knowledge, on my professional training and experience, and on the public sources identified below. I write this affidavit in support of the Petitioners Emergency Motion for a Stay.[1] If called as a witness, I could and would testify competently to the facts stated here.

2. I hold a Ph.D. in Environmental Health Science with a focus on micrometeorology from the University of Kansas in 1992. I was employed by the U.S. Environmental Protection Agency from 1990 until my retirement in 2019. During that time, I served as a federal On-Scene Coordinator and managed EPA's Airborne Spectral Photometric Environmental Collection

[1] Order Granting Administrative Stay, *Iowa Environmental Council v. U.S. Environmental Protection Agency*, No. 26-3374 (8th Cir. Nov. 19, 2026), Entry ID 5708083, https://cbs2iowa.com/resources/pdf/a9059b45-c99f-42fe-9b72-e07aeb8a51c4-StayorderSierraClub.pdf.

Technology (ASPECT) program from its inception in 2001 until my retirement. I currently work for Spectral Systems Integration.

3. Over my career I have conducted extensive air monitoring at chemical emergencies, including open-path Fourier Transform Infrared (FTIR) spectroscopy and whole-gas analytical measurements, much of it with Dr. Robert Kroutil. Kroutil is a retired senior Department of War scientist from the Department of the Army Edgewood Chemical Research and Development Center at Aberdeen Proving Ground (APG), Maryland. He has 40 years' experience involved with chemical matters associated with the Department of the Army. He also currently works for Spectral Systems Integration.

The Army's Stated Reason for a Monday Deadline

4. Bowing to public pressure, on Thursday, November 19, 2026, the U.S. Army postponed its planned detonation of approximately 9,500 to 10,000 pounds of lead azide at the Iowa Army Ammunition Plant near Middletown, Iowa, from November 20 to November 23, 2026.[2]

5. Acting Secretary of the Army Adam R. Telle stated that the postponement would "delay the detonation until the latest possible moment prior to a forecasted temperature drop," which he said, "would risk further destabilization of the material."[3]

[2] Tom Barton, "Army Delays Lead Azide Detonation until Monday, Says 'Public Safety' Is a Top Priority," Iowa Public Radio, November 19, 2026, https://www.iowapublicradio.org/ipr-news/2026-11-19/army-postpones-iowa-lead-azide-detonation.

[3] Adam R. Telle (@SecArmy), "Public safety is the Army's top priority, and I have directed Army Materiel Command to postpone tomorrow's controlled detonation at the Iowa Army Ammunition Plant," X, November 19, 2026, [time] p.m., https://x.com/SecArmy/status/2123574872559493304.

The Lead Azide Is Stored in Earth-Covered Magazines That Buffer Outdoor Temperature Swings

6. According to EPA's emergency permit, the 68 drums of lead azide are stored within Earth Covered Magazines at the plant.[4] The Army has stated that because of the material's hazard, it will be destroyed in place, so the drums will not be moved into the open. [Cite source.] Google Earth imagery of the storage area, which I reviewed on November 20, 2026, is consistent with earth-covered structures.

7. Soil is an effective thermal insulator. An earth-covered concrete magazine has substantial thermal mass, and its interior temperature responds slowly to changes in outdoor air temperature. In my professional opinion, a change in outdoor temperature of up to approximately 20 degrees Fahrenheit over a period of days would not produce an immediate or comparable change in temperature inside the magazines.

8. Reports indicate that, in preparation for the detonation, wetted sand has been placed against the sides and top of the magazines.[5] That material adds further thermal mass and would further slow any change in interior temperature.

[4] U.S. Environmental Protection Agency, Region 7, *Emergency Hazardous Waste Management Facility Permit for Storage and Treatment of Lead Azide, Iowa Army Ammunition Plant*, EPA RCRA ID No. IA7213820445 November 13, 2026, 1 to 2.

[5] U.S. Army, Iowa Army Ammunition Plant, "Public and Media Advisory Regarding the Detonation of Lead Azide at Iowa Army Ammunition Plant in Middletown, Iowa," November 18, 2026, https://d34w7g4gy10iej.cloudfront.net/pubs/pdf_78366.pdf.

The Forecast Does Not Present a Departure from Conditions the Material Has Already Experienced

9. The forecast for the Burlington, Iowa area through November 30, 2026, shows lows in the 20s and highs in the upper 30s degrees Fahrenheit, with temperatures forecast to return to the mid-50s after that date.[6]

10. Throughout November 2026, the Burlington area has already recorded lows in the mid-20s and highs in the mid-40s.[7] The forecast cold period is therefore comparable to conditions the stored material has already experienced this month without incident, and it is followed by forecast warming.

Temperature and the Army's Destabilization Concern

11. I understand the Army's stated concern about "further destabilization" to mean that lead azide may become more sensitive to friction or shock in colder conditions. The Army has not, to my knowledge, published data or analysis showing that the sensitivity of this material changes over the temperature range forecast or quantifying any such change. Regardless of the chemistry, for the reasons stated in paragraphs 6 through 8, the forecast change in outdoor temperature would not translate into an immediate or comparable change in temperature inside the earth-covered magazines where the material is stored.

[6] National Weather Service, Quad Cities Forecast Office, "7-Day Forecast for Burlington, Iowa (40.81°N, 91.12°W)," accessed November 20, 2026, https://forecast.weather.gov/MapClick.php?lat=40.80696&lon=-91.11598.

[7] National Weather Service, Quad Cities Forecast Office, "Preliminary Monthly Climate Data (CF6), Burlington, Iowa (BRL), November 2026," accessed November 20, 2026, https://forecast.weather.gov/product.php?site=DVN&issuedby=BRL&product=CF6&format=TXT&version=1&glossary=0.

Conclusion

12. Based on my training and experience, the storage conditions described in EPA's permit, and historical and forecast weather for the Burlington area, it is my opinion that the forecast weather does not support the Army's position that the detonation must occur no later than November 23, 2026, or that a delay to allow judicial review would materially increase the hazard posed by the stored lead azide.

FURTHER AFFIANT SAYETH NOT.

Mark J. Thomas, Ph.D.
Dated: November 20, 2026

IN THE UNITED STATES COURT OF APPEALS
FOR THE EIGHTH CIRCUIT

IOWA ENVIRONMENTAL COUNCIL and SIERRA CLUB, *Petitioners*, v. UNITED STATES ENVIRONMENTAL PROTECTION AGENCY; LEE ZELDIN, in his official capacity as Administrator, U.S. Environmental Protection Agency; and JIM MACY in his official capacity as Regional Administrator, Region 7, U.S. Environmental Protection Agency, *Respondents*.	)	Case No. 26-3374 DECLARATION OF DR. RANAJIT (RON) SAHU

DECLARATION OF DR. RANAJIT (RON) SAHU

I, Ranajit Sahu, declare and state as follows:

Professional Background

1. I have over 33 years of experience in the fields of environmental, mechanical, and chemical engineering including: program and project management services, multimedia/multi-pathway human health risk assessments for toxics; air dispersion modeling; and multimedia environmental regulatory compliance, involving various statutes and regulations, including the federal Resource Conservation and Recovery Act, Clean Air Act, and Clean Water Act. In that time, I have conducted many environmental sampling campaigns, including all aspects from field sample collection to designing sampling plans, to managing large-scale sampling efforts.

2. I am, by training and experience, a mechanical engineer with advanced degrees that involved inter-disciplinary application of mechanical, chemical, and environmental engineering and science. Based on my education and training, I have conducted projects in all 50 states and around the world on all aspects of environmental analysis, compliance, and related matters. My work experience includes extensive air quality, water quality, and waste management consulting.

3. Specifically pertinent to this matter, I am a combustion and heat transfer expert by education, training, and professional practice. My Ph.D. work at Caltech, noted in the next paragraph, dealt with combustion of coal char. As a consultant I have dealt with numerous projects dealing not only with combustion and heat transfer but also the generation of air pollutants as a result of complete and incomplete combustion.

4. I received a Bachelor of Technology (Honors) degree in Mechanical Engineering from the Indian Institute of Technology followed in 1983. In 1984, I received an M.S. in Mechanical Engineering degree from the California Institute of Technology (Caltech), and in 1988 I completed a Ph.D. also in Mechanical Engineering from Caltech.

5. I have provided written and oral testimony before the United States Congress, House Subcommittee on Energy, and the Environment, and provided expert testimony in federal and state litigation and regulatory proceedings in hundreds of matters across the United States.

6. A copy of my current CV is provided in Attachment A.

Detonation of Lead Azide at Iowa Army Ammunition Plant

7. I understand that the U.S. Army has received an emergency permit to detonate 68 drums of degraded lead azide at the Iowa Army Ammunition Plant (IAAAP). I have reviewed this permit[1] and its conditions. It has an effective date of November 13, 2026 and an expiration date of February 11, 2027.

8. In addition to the Emergency Permit, I have also reviewed the scant publicly available materials[2] associated with this proposed action including: (i) a Questions and Answers document; (ii) the NEPA Environmental Assessment (EA); (iii) the Mitigated Finding of No Significant Impact (FONSI); (iv) the EPA's OSC Response page[3] on this matter on its website; and several press articles.

[1] https://www.epa.gov/system/files/documents/2026-11/iaaap-emergency-permit-for-treatment-and-storage-final_redacted.pdf

[2] Available at https://www.army.mil/asc#org-iowa-army-ammunition-plant

[3] https://www.epa.gov/ia/iowa-army-ammunition-plant-middletown-iowa-3

9. In addition to the documents above I have also reviewed a contract solicitation[4] regarding Lead Azide Neutralization at the IAAAP dated September 9, 2025 – which predates by many months the discovery in March 2026 of the crystallization of the lead azide that is noted in the EA at pdf page 6 pursuant to a "proactive facility safety review." It is unclear why the Army was soliciting a contract in September 2025, well before the supposed discovery of the danger via its safety review in March 2026. This raises questions about when the Army knew of the problem.

10. The EA (pdf page 7) claims that the Blow-in-Place mitigated detonation will "definitively" destroy the shock sensitive material. Later, at pdf page 9 the Army states that the objective is to "destroy the lead azide" and that the "end state of the action is the total destruction of unserviceable material…" Detonations of any energetic materials are never 100 percent effective in destroying energetic materials. In fact, so called "yields" of detonation (in simple terms, the percent of energetic material that is destroyed in a detonation or the percent of energy that is released in a detonation compared to the total energy in all of the energetic material to be destroyed) are often well below 1 or 100 percent, indicating that not all of the energetic material is destroyed, given the violent nature of the detonation and the resulting dispersal of the material itself as well as detonation/combustion by products. In fact, the EA, at pdf page 12 confirms that among the hazardous constituents that may be released are "…unreacted energetics…"

11. In addition to unreacted energetics, the EA at pdf page 12 notes that the airborne releases will include lead particulates and toxic gases (e.g., hydrazoic acid). Elsewhere the Army notes that the releases will include unspecified "combustion gases" (see EA pdf page 20).

12. I note that hydrazoic acid, which the EA admits will be produced, is a colorless, volatile, and explosive liquid at room temperature and pressure. It is also highly toxic.[5]

13. Yet, the only assessment I have seen to date has been for lead only and not for the unreacted energetics or hydrazoic acid. Based on my knowledge and experience, I cannot rule out the potential formation and release of a wider range of combustion toxics including many volatile organic compounds (because the lead azide is stored in an ethanol/water mixture[6]), hydrogen cyanide, and others.

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[4] https://www.highergov.com/contract-opportunity/lead-azide-neutralization-at-iowa-army-ammunition-w519tc-25-r-ia31-k-759d3/

[5] https://pubchem.ncbi.nlm.nih.gov/compound/24530#section=Other-Experimental-Properties

[6] FONSI, at page 1.

14. When lead azide, stored in the 68 drums in an ethanol/water mixture, while partially crystallized, is detonated using unspecified donor charges, as noted above the detonation will: (i) not destroy all of the lead azide and some of it will be released via the opening in the mitigation barrier; (ii) produce a range of lead compounds; and (iii) produce additional toxics such as hydrazoic acid and a range of toxic VOCs. These will be released to the ambient atmosphere and exposure to these chemicals can present serious risk to humans, animals, and the environment via inhalation, dermal contact, incidental ingestion, impacts on land, and impacts on streams and waterways.

15. Given the lack of detail provided to the public, it is clear that the potential for release of such dangerous chemicals and their impacts have not been fully assessed in planning for this detonation. It only appears that the Army and EPA have modeled the release of lead alone and assessed its impact using the National Ambient Air Quality Standard (NAAQS) for lead. It is important for the public to know about impacts of the non-lead toxics I have noted. This will require additional modeling and risk assessment.

16. I understand that there are mitigation measures in place for the detonation, however without additional information, it is not possible to assure that those measures will be effective in protecting human health. Little is publicly disclosed about the design basis for the mitigation such as the Integrated Engineering Blast Controls (see FONSI pdf page 2) which include "19,000 cubic yards …of lime-fill foundation and 300 sand-filled HESCO barriers…" How these quantities of foundation and barrier materials were determined in not clear. Therefore, their ability to contain the simultaneous blast energy from the detonation of the 68 drums in two separate earth-covered magazines (ECMs) is not at all clear.

17. The public record also contains no information about what is contained in the other ECMs near the two in question that will be destroyed and what impacts the lead azide detonation might cause to the other nearby ECMs (see EA pdf page 17) and their unknown contents.

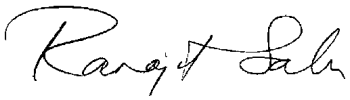
18. Without a more thorough analysis of the expected blast energy release, the type, numbers, and placement of the donor charges, the expected yield(s), and the combustion byproducts that will result from this proposed detonation action, a proper mitigation design cannot be assessed. The presence of water cannons and wetting mitigation is simply impossible to evaluate without additional details of how the detonation and its aftermath will unfold.

19. It is my opinion that the EA has hastily rejected the option of chemical neutralization. The Army and EPA should engage with independent experts to comprehensively and transparently consider all alternatives to detonating the crystallized lead azide (thus creating environmental and public health risks), including chemical neutralization and those identified by the National Academies of Sciences, and explain to the public why they were rejected (see Attachment B).

20. Even for the modeling of lead, the Emergency Permit states (at page 3 of 25) that a "conservative Emission Factor" was used. Later, at page 22 of 25 in the Permit, it notes that this Emission Factor was 1.00, with no units noted. It is not clear why this Emission Factor is conservative or, in fact, what is represents. I therefore reject the conclusions of the modeling for lead that its impacts are of no significance.

21. Condition N.1 of the Emergency Permit redacts the text for what is permitted to be "treated" except for the 68 drums of lead azide. The reason for this redaction is not clear..

22. Finally, I note that the EA at pdf page 19 states that a range of baseline assessments have been conducted or will have been conducted before the detonation. I could not find the results of any such baseline assessments anywhere in the public record.



(Ranajit Sahu)

Alhambra, CA

Attachment A

RANAJIT (RON) SAHU, PH.D, CEM (NEVADA)

CONSULTANT, ENVIRONMENTAL AND ENERGY ISSUES

311 North Story Place
Alhambra, CA 91801
Phone: 702.683.5466
e-mail (preferred): ronsahu@gmail.com; sahuron@earthlink.net

EXPERIENCE SUMMARY

Dr. Sahu has over thirty five years of experience in the fields of environmental, mechanical, and chemical engineering including: program and project management services; design and specification of pollution control equipment for a wide range of emissions sources including stationary and mobile sources; soils and groundwater remediation including landfills as remedy; combustion engineering evaluations; energy studies; multimedia environmental regulatory compliance (involving statutes and regulations such as the Federal CAA and its Amendments, Clean Water Act, TSCA, RCRA, CERCLA, SARA, OSHA, NEPA as well as various related state statutes); transportation air quality impact analysis; multimedia compliance audits; multimedia permitting (including air quality NSR/PSD permitting, Title V permitting, NPDES permitting for industrial and storm water discharges, RCRA permitting, etc.), multimedia/multi-pathway human health risk assessments for toxics; air dispersion modeling; and regulatory strategy development and support including negotiation of consent agreements and orders.

He has almost thirty six years of project management experience and has successfully managed and executed hundreds of projects in this time period. This includes basic and applied research projects, design projects, regulatory compliance projects, permitting projects, energy studies, risk assessment projects, and projects involving the communication of environmental data and information to the public.

He has provided consulting services to numerous private sector, public sector and public interest group clients. His major clients over the past three decades include various trade associations as well as individual companies such as steel mills, petroleum refineries, chemical plants, cement manufacturers, aerospace companies, power generation facilities, lawn and garden equipment manufacturers, spa manufacturers, chemical distribution facilities, land development companies, and various entities in the public sector including EPA, the US Dept. of Justice, several states (including Arizona, New York, New Jersey, Connecticut, Kansas, Oregon, New Mexico, Pennsylvania, Texas, and others), various agencies such as the California DTSC, Oregon Public Utility Commission, and various cities and municipalities. Dr. Sahu has executed projects in all 50 US states, numerous local jurisdictions and internationally.

In addition to consulting, for approximately two decades, Dr. Sahu taught numerous courses in several Southern California universities as adjunct faculty, including UCLA (air pollution), UC Riverside (air pollution, process hazard analysis), and Loyola Marymount University (air pollution, risk assessment, hazardous waste management). He also taught at Caltech, his alma mater (various engineering courses), at the University of Southern California (air pollution controls) and at California State University, Fullerton (transportation and air quality).

Dr. Sahu has and continues to provide expert witness services in a number of environmental and engineering areas discussed above in both state and Federal courts as well as before administrative bodies (please see Annex A).

EXPERIENCE RECORD

2000-present **Independent Consultant.** Providing a variety of private sector (industrial companies, land development companies, law firms, etc.), public sector (such as the US Department of Justice), and public interest group clients with project management, environmental

consulting, project management, as well as regulatory and engineering support consulting services.

1995-2000 Parsons ES, **Associate, Senior Project Manager and Department Manager for** Air Quality/Geosciences/Hazardous Waste Groups, Pasadena, CA.

Parsons ES, **Manager for Air Source Testing Services**. Responsible for the management of 8 individuals in the area of air source testing and air regulatory permitting projects located in Bakersfield, California.

1992-1995 Engineering-Science, Inc. **Principal Engineer and Senior Project Manager** in the air quality department.

1990-1992 Engineering-Science, Inc. **Principal Engineer and Project Manager** in the air quality department.

1989-1990 Kinetics Technology International, Corp. **Development Engineer.** Involved in thermal engineering R&D and project work related to low-NOx ceramic radiant burners, fired heater NOx reduction, SCR design, and fired heater retrofitting.

1988-1989 Heat Transfer Research, Inc. **Research Engineer**. Involved in the design of fired heaters, heat exchangers, air coolers, and other non-fired equipment. Also did research in the area of heat exchanger tube vibrations.

EDUCATION

1984-1988 Ph.D., Mechanical Engineering, California Institute of Technology (Caltech), Pasadena, CA.

1984 M. S., Mechanical Engineering, California Institute of Technology (Caltech), Pasadena, CA.

1978-1983 B. Tech (Honors), Mechanical Engineering, Indian Institute of Technology (IIT) Kharagpur, India

TEACHING EXPERIENCE

Caltech

"Thermodynamics," Teaching Assistant, California Institute of Technology, 1983, 1987.

"Air Pollution Control," Teaching Assistant, California Institute of Technology, 1985.

"Caltech Secondary and High School Saturday Program," - taught various mathematics (algebra through calculus) and science (physics and chemistry) courses to high school students, 1983-1989.

"Heat Transfer," - taught this course in the Fall and Winter terms of 1994-1995 in the Division of Engineering and Applied Science.

“Thermodynamics and Heat Transfer,” Fall and Winter Terms of 1996-1997.

U.C. Riverside, Extension

"Toxic and Hazardous Air Contaminants," University of California Extension Program, Riverside, California. Various years since 1992.

"Prevention and Management of Accidental Air Emissions," University of California Extension Program, Riverside, California. Various years since 1992.

"Air Pollution Control Systems and Strategies," University of California Extension Program, Riverside, California, Summer 1992-93, Summer 1993-1994.

"Air Pollution Calculations," University of California Extension Program, Riverside, California, Fall 1993-94, Winter 1993-94, Fall 1994-95.

"Process Safety Management," University of California Extension Program, Riverside, California. Various years since 1992-2010.

"Process Safety Management," University of California Extension Program, Riverside, California, at SCAQMD, Spring 1993-94.

"Advanced Hazard Analysis - A Special Course for LEPCs," University of California Extension Program, Riverside, California, taught at San Diego, California, Spring 1993-1994.

"Advanced Hazardous Waste Management" University of California Extension Program, Riverside, California. 2005.

Loyola Marymount University

"Fundamentals of Air Pollution - Regulations, Controls and Engineering," Loyola Marymount University, Dept. of Civil Engineering. Various years beginning 1993.

"Air Pollution Control," Loyola Marymount University, Dept. of Civil Engineering, Fall 1994.

"Environmental Risk Assessment," Loyola Marymount University, Dept. of Civil Engineering. Various years beginning 1998.

"Hazardous Waste Remediation" Loyola Marymount University, Dept. of Civil Engineering. Various years beginning 2006.

University of Southern California

"Air Pollution Controls," University of Southern California, Dept. of Civil Engineering, Fall 1993, Fall 1994.

"Air Pollution Fundamentals," University of Southern California, Dept. of Civil Engineering, Winter 1994.

University of California, Los Angeles

"Air Pollution Fundamentals," University of California, Los Angeles, Dept. of Civil and Environmental Engineering, Spring 1994, Spring 1999, Spring 2000, Spring 2003, Spring 2006, Spring 2007, Spring 2008, Spring 2009.

International Programs

"Environmental Planning and Management," 5 week program for visiting Chinese delegation, 1994.

"Environmental Planning and Management," 1 day program for visiting Russian delegation, 1995.

"Air Pollution Planning and Management," IEP, UCR, Spring 1996.

"Environmental Issues and Air Pollution," IEP, UCR, October 1996.

PROFESSIONAL AFFILIATIONS AND HONORS

President of India Gold Medal, IIT Kharagpur, India, 1983.

Member of the Alternatives Assessment Committee of the Grand Canyon Visibility Transport Commission, established by the Clean Air Act Amendments of 1990, 1992.

American Society of Mechanical Engineers: Los Angeles Section Executive Committee, Heat Transfer Division, and Fuels and Combustion Technology Division, 1987-mid-1990s.

Air and Waste Management Association, West Coast Section, 1989-mid-2000s.

PROFESSIONAL CERTIFICATIONS

EIT, California (#XE088305), 1993.

REA I, California (#07438), 2000.

Certified Permitting Professional, South Coast AQMD (#C8320), since 1993.

QEP, Institute of Professional Environmental Practice, 2000 - 2021.

CEM, State of Nevada (#EM-1699).

PUBLICATIONS (PARTIAL LIST)

"Physical Properties and Oxidation Rates of Chars from Bituminous Coals," with Y.A. Levendis, R.C. Flagan and G.R. Gavalas, *Fuel*, **67**, 275-283 (1988).

"Char Combustion: Measurement and Analysis of Particle Temperature Histories," with R.C. Flagan, G.R. Gavalas and P.S. Northrop, *Comb. Sci. Tech.* **60**, 215-230 (1988).

"On the Combustion of Bituminous Coal Chars," PhD Thesis, California Institute of Technology (1988).

"Optical Pyrometry: A Powerful Tool for Coal Combustion Diagnostics," *J. Coal Quality*, **8**, 17-22 (1989).

"Post-Ignition Transients in the Combustion of Single Char Particles," with Y.A. Levendis, R.C. Flagan and G.R. Gavalas, *Fuel*, **68**, 849-855 (1989).

"A Model for Single Particle Combustion of Bituminous Coal Char." Proc. ASME National Heat Transfer Conference, Philadelphia, **HTD-Vol. 106**, 505-513 (1989).

"Discrete Simulation of Cenospheric Coal-Char Combustion," with R.C. Flagan and G.R. Gavalas, *Combust. Flame*, **77**, 337-346 (1989).

"Particle Measurements in Coal Combustion," with R.C. Flagan, in "**Combustion Measurements**" (ed. N. Chigier), Hemisphere Publishing Corp. (1991).

"Cross Linking in Pore Structures and Its Effect on Reactivity," with G.R. Gavalas in preparation.

"Natural Frequencies and Mode Shapes of Straight Tubes," Proprietary Report for Heat Transfer Research Institute, Alhambra, CA (1990).

"Optimal Tube Layouts for Kamui SL-Series Exchangers," with K. Ishihara, Proprietary Report for Kamui Company Limited, Tokyo, Japan (1990).

"HTRI Process Heater Conceptual Design," Proprietary Report for Heat Transfer Research Institute, Alhambra, CA (1990).

"Asymptotic Theory of Transonic Wind Tunnel Wall Interference," with N.D. Malmuth and others, Arnold Engineering Development Center, Air Force Systems Command, USAF (1990).

"Gas Radiation in a Fired Heater Convection Section," Proprietary Report for Heat Transfer Research Institute, College Station, TX (1990).

"Heat Transfer and Pressure Drop in NTIW Heat Exchangers," Proprietary Report for Heat Transfer Research Institute, College Station, TX (1991).

"NOx Control and Thermal Design," Thermal Engineering Tech Briefs, (1994).

“From Purchase of Landmark Environmental Insurance to Remediation: Case Study in Henderson, Nevada,” with Robin E. Bain and Jill Quillin, presented at the AQMA Annual Meeting, Florida, 2001.

“The Jones Act Contribution to Global Warming, Acid Rain and Toxic Air Contaminants,” with Charles W. Botsford, presented at the AQMA Annual Meeting, Florida, 2001.

PRESENTATIONS (PARTIAL LIST)

"Pore Structure and Combustion Kinetics - Interpretation of Single Particle Temperature-Time Histories," with P.S. Northrop, R.C. Flagan and G.R. Gavalas, presented at the AIChE Annual Meeting, New York (1987).

"Measurement of Temperature-Time Histories of Burning Single Coal Char Particles," with R.C. Flagan, presented at the American Flame Research Committee Fall International Symposium, Pittsburgh, (1988).

"Physical Characterization of a Cenospheric Coal Char Burned at High Temperatures," with R.C. Flagan and G.R. Gavalas, presented at the Fall Meeting of the Western States Section of the Combustion Institute, Laguna Beach, California (1988).

"Control of Nitrogen Oxide Emissions in Gas Fired Heaters - The Retrofit Experience," with G. P. Croce and R. Patel, presented at the International Conference on Environmental Control of Combustion Processes (Jointly sponsored by the American Flame Research Committee and the Japan Flame Research Committee), Honolulu, Hawaii (1991).

"Air Toxics - Past, Present and the Future," presented at the Joint AIChE/AAEE Breakfast Meeting at the AIChE 1991 Annual Meeting, Los Angeles, California, November 17-22 (1991).

"Air Toxics Emissions and Risk Impacts from Automobiles Using Reformulated Gasolines," presented at the Third Annual Current Issues in Air Toxics Conference, Sacramento, California, November 9-10 (1992).

"Air Toxics from Mobile Sources," presented at the Environmental Health Sciences (ESE) Seminar Series, UCLA, Los Angeles, California, November 12, (1992).

"Kilns, Ovens, and Dryers - Present and Future," presented at the Gas Company Air Quality Permit Assistance Seminar, Industry Hills Sheraton, California, November 20, (1992).

"The Design and Implementation of Vehicle Scrapping Programs," presented at the 86th Annual Meeting of the Air and Waste Management Association, Denver, Colorado, June 12, 1993.

"Air Quality Planning and Control in Beijing, China," presented at the 87th Annual Meeting of the Air and Waste Management Association, Cincinnati, Ohio, June 19-24, 1994.

Annex A

Expert Litigation Support

A. Occasions where Dr. Sahu has provided Written or Oral testimony before Congress:

1. In July 2012, provided expert written and oral testimony to the House Subcommittee on Energy and the Environment, Committee on Science, Space, and Technology at a Hearing entitled "Hitting the Ethanol Blend Wall – Examining the Science on E15."

B. Matters for which Dr. Sahu has provided affidavits and expert reports include:

2. Affidavit for Rocky Mountain Steel Mills, Inc. located in Pueblo Colorado – dealing with the technical uncertainties associated with night-time opacity measurements in general and at this steel mini-mill.

3. Expert reports and depositions (2/28/2002 and 3/1/2002; 12/2/2003 and 12/3/2003; 5/24/2004) on behalf of the United States in connection with the Ohio Edison NSR Cases. *United States, et al. v. Ohio Edison Co., et al.*, C2-99-1181 (Southern District of Ohio).

4. Expert reports and depositions (5/23/2002 and 5/24/2002) on behalf of the United States in connection with the Illinois Power NSR Case. *United States v. Illinois Power Co., et al.*, 99-833-MJR (Southern District of Illinois).

5. Expert reports and depositions (11/25/2002 and 11/26/2002) on behalf of the United States in connection with the Duke Power NSR Case. *United States, et al. v. Duke Energy Corp.*, 1:00-CV-1262 (Middle District of North Carolina).

6. Expert reports and depositions (10/6/2004 and 10/7/2004; 7/10/2006) on behalf of the United States in connection with the American Electric Power NSR Cases. *United States, et al. v. American Electric Power Service Corp., et al.*, C2-99-1182, C2-99-1250 (Southern District of Ohio).

7. Affidavit (March 2005) on behalf of the Minnesota Center for Environmental Advocacy and others in the matter of the Application of Heron Lake BioEnergy LLC to construct and operate an ethanol production facility – submitted to the Minnesota Pollution Control Agency.

8. Expert Report and Deposition (10/31/2005 and 11/1/2005) on behalf of the United States in connection with the East Kentucky Power Cooperative NSR Case. *United States v. East Kentucky Power Cooperative, Inc*., 5:04-cv-00034-KSF (Eastern District of Kentucky).

9. Affidavits and deposition on behalf of Basic Management Inc. (BMI) Companies in connection with the BMI vs. USA remediation cost recovery Case.

10. Expert Report on behalf of Penn Future and others in the Cambria Coke plant permit challenge in Pennsylvania.

11. Expert Report on behalf of the Appalachian Center for the Economy and the Environment and others in the Western Greenbrier permit challenge in West Virginia.

12. Expert Report, deposition (via telephone on January 26, 2007) on behalf of various Montana petitioners (Citizens Awareness Network (CAN), Women's Voices for the Earth (WVE) and the Clark Fork Coalition (CFC)) in the Thompson River Cogeneration LLC Permit No. 3175-04 challenge.

13. Expert Report and deposition (2/2/07) on behalf of the Texas Clean Air Cities Coalition at the Texas State Office of Administrative Hearings (SOAH) in the matter of the permit challenges to TXU Project Apollo's eight new proposed PRB-fired PC boilers located at seven TX sites.

14. Expert Testimony (July 2007) on behalf of the Izaak Walton League of America and others in connection with the acquisition of power by Xcel Energy from the proposed Gascoyne Power Plant – at the State of Minnesota, Office of Administrative Hearings for the Minnesota PUC (MPUC No. E002/CN-06-1518; OAH No. 12-2500-17857-2).

15. Affidavit (July 2007) Comments on the Big Cajun I Draft Permit on behalf of the Sierra Club – submitted to the Louisiana DEQ.

16. Expert Report and Deposition (12/13/2007) on behalf of Commonwealth of Pennsylvania – Dept. of Environmental Protection, State of Connecticut, State of New York, and State of New Jersey (Plaintiffs) in connection with the Allegheny Energy NSR Case. *Plaintiffs v. Allegheny Energy Inc., et al.,* 2:05cv0885 (Western District of Pennsylvania).

17. Expert Reports and Pre-filed Testimony before the Utah Air Quality Board on behalf of Sierra Club in the Sevier Power Plant permit challenge.

18. Expert Report and Deposition (October 2007) on behalf of MTD Products Inc., in connection with *General Power Products, LLC v MTD Products Inc*., 1:06 CVA 0143 (Southern District of Ohio, Western Division) .

19. Expert Report and Deposition (June 2008) on behalf of Sierra Club and others in the matter of permit challenges (Title V: 28.0801-29 and PSD: 28.0803-PSD) for the Big Stone II unit, proposed to be located near Milbank, South Dakota.

20. Expert Reports, Affidavit, and Deposition (August 15, 2008) on behalf of Earthjustice in the matter of air permit challenge (CT-4631) for the Basin Electric Dry Fork station, under construction near Gillette, Wyoming before the Environmental Quality Council of the State of Wyoming.

21. Affidavits (May 2010/June 2010 in the Office of Administrative Hearings))/Declaration and Expert Report (November 2009 in the Office of Administrative Hearings) on behalf of NRDC and the Southern Environmental Law Center in the matter of the air permit challenge for Duke Cliffside Unit 6. Office of Administrative Hearing Matters 08 EHR 0771, 0835 and 0836 and 09 HER 3102, 3174, and 3176 (consolidated).

22. Declaration (August 2008), Expert Report (January 2009), and Declaration (May 2009) on behalf of Southern Alliance for Clean Energy in the matter of the air permit challenge for Duke Cliffside Unit 6. *Southern Alliance for Clean Energy et al., v. Duke Energy Carolinas, LLC*, Case No. 1:08-cv-00318-LHT-DLH (Western District of North Carolina, Asheville Division).

23. Declaration (August 2008) on behalf of the Sierra Club in the matter of Dominion Wise County plant MACT.us

24. Expert Report (June 2008) on behalf of Sierra Club for the Green Energy Resource Recovery Project, MACT Analysis.

25. Expert Report (February 2009) on behalf of Sierra Club and the Environmental Integrity Project in the matter of the air permit challenge for NRG Limestone's proposed Unit 3 in Texas.

26. Expert Report (June 2009) on behalf of MTD Products, Inc., in the matter of *Alice Holmes and Vernon Holmes v. Home Depot USA, Inc., et al.*

27. Expert Report (August 2009) on behalf of Sierra Club and the Southern Environmental Law Center in the matter of the air permit challenge for Santee Cooper's proposed Pee Dee plant in South Carolina).

28. Statements (May 2008 and September 2009) on behalf of the Minnesota Center for Environmental Advocacy to the Minnesota Pollution Control Agency in the matter of the Minnesota Haze State Implementation Plans.

29. Expert Report (August 2009) on behalf of Environmental Defense, in the matter of permit challenges to the proposed Las Brisas coal fired power plant project at the Texas State Office of Administrative Hearings (SOAH).

30. Expert Report and Rebuttal Report (September 2009) on behalf of the Sierra Club, in the matter of challenges to the proposed Medicine Bow Fuel and Power IGL plant in Cheyenne, Wyoming.

31. Expert Report (December 2009) and Rebuttal reports (May 2010 and June 2010) on behalf of the United States in connection with the Alabama Power Company NSR Case. *United States v. Alabama Power Company*, CV-01-HS-152-S (Northern District of Alabama, Southern Division).

32. Pre-filed Testimony (October 2009) on behalf of Environmental Defense and others, in the matter of challenges to the proposed White Stallion Energy Center coal fired power plant project at the Texas State Office of Administrative Hearings (SOAH).

33. Pre-filed Testimony (July 2010) and Written Rebuttal Testimony (August 2010) on behalf of the State of New Mexico Environment Department in the matter of Proposed Regulation 20.2.350 NMAC – *Greenhouse Gas Cap and Trade Provisions,* No. EIB 10-04 (R), to the State of New Mexico, Environmental Improvement Board.

34. Expert Report (August 2010) and Rebuttal Expert Report (October 2010) on behalf of the United States in connection with the Louisiana Generating NSR Case. *United States v. Louisiana Generating, LLC*, 09-CV100-RET-CN (Middle District of Louisiana) – Liability Phase.

35. Declaration (August 2010), Reply Declaration (November 2010), Expert Report (April 2011), Supplemental and Rebuttal Expert Report (July 2011) on behalf of the United States in the matter of DTE Energy Company and Detroit Edison Company (Monroe Unit 2). *United States of America v. DTE Energy Company and Detroit Edison Company*, Civil Action No. 2:10-cv-13101-BAF-RSW (Eastern District of Michigan).

36. Expert Report and Deposition (August 2010) as well as Affidavit (September 2010) on behalf of Kentucky Waterways Alliance, Sierra Club, and Valley Watch in the matter of challenges to the NPDES permit issued for the Trimble County power plant by the Kentucky Energy and Environment Cabinet to Louisville Gas and Electric, File No. DOW-41106-047.

37. Expert Report (August 2010), Rebuttal Expert Report (September 2010), Supplemental Expert Report (September 2011), and Declaration (November 2011) on behalf of Wild Earth Guardians in the matter of opacity exceedances and monitor downtime at the Public Service Company of Colorado (Xcel)'s Cherokee power plant. No. 09-cv-1862 (District of Colorado).

38. Written Direct Expert Testimony (August 2010) and Affidavit (February 2012) on behalf of Fall-Line Alliance for a Clean Environment and others in the matter of the PSD Air Permit for Plant Washington issued by Georgia DNR at the Office of State Administrative Hearing, State of Georgia (OSAH-BNR-AQ-1031707-98-WALKER).

39. Deposition (August 2010) on behalf of Environmental Defense, in the matter of the remanded permit challenge to the proposed Las Brisas coal fired power plant project at the Texas State Office of Administrative Hearings (SOAH).

40. Expert Report, Supplemental/Rebuttal Expert Report, and Declarations (October 2010, November 2010, September 2012) on behalf of New Mexico Environment Department (Plaintiff-Intervenor), Grand Canyon Trust and Sierra Club (Plaintiffs) in the matter of *Plaintiffs v. Public Service Company of New Mexico* (PNM), Civil No. 1:02-CV-0552 BB/ATC (ACE) (District of New Mexico).

41. Expert Report (October 2010) and Rebuttal Expert Report (November 2010) (BART Determinations for PSCo Hayden and CSU Martin Drake units) to the Colorado Air Quality Commission on behalf of Coalition of Environmental Organizations.

42. Expert Report (November 2010) (BART Determinations for TriState Craig Units, CSU Nixon Unit, and PRPA Rawhide Unit) to the Colorado Air Quality Commission on behalf of Coalition of Environmental Organizations.

43. Declaration (November 2010) on behalf of the Sierra Club in connection with the Martin Lake Station Units 1, 2, and 3. *Sierra Club v. Energy Future Holdings Corporation and Luminant*

Generation Company LLC, Case No. 5:10-cv-00156-DF-CMC (Eastern District of Texas, Texarkana Division).

44. Pre-Filed Testimony (January 2011) and Declaration (February 2011) to the Georgia Office of State Administrative Hearings (OSAH) in the matter of Minor Source HAPs status for the proposed Longleaf Energy Associates power plant (OSAH-BNR-AQ-1115157-60-HOWELLS) on behalf of the Friends of the Chattahoochee and the Sierra Club).

45. Declaration (February 2011) in the matter of the Draft Title V Permit for RRI Energy MidAtlantic Power Holdings LLC Shawville Generating Station (Pennsylvania), ID No. 17-00001 on behalf of the Sierra Club.

46. Expert Report (March 2011), Rebuttal Expert Report (June 2011) on behalf of the United States in *United States of America v. Cemex, Inc.*, Civil Action No. 09-cv-00019-MSK-MEH (District of Colorado).

47. Declaration (April 2011) and Expert Report (July 16, 2012) in the matter of the Lower Colorado River Authority (LCRA)'s Fayette (Sam Seymour) Power Plant on behalf of the Texas Campaign for the Environment. *Texas Campaign for the Environment v. Lower Colorado River Authority,* Civil Action No. 4:11-cv-00791 (Southern District of Texas, Houston Division).

48. Declaration (June 2011) on behalf of the Plaintiffs MYTAPN in the matter of Microsoft-Yes, Toxic Air Pollution-No (MYTAPN) v. State of Washington, Department of Ecology and Microsoft Corporation Columbia Data Center to the Pollution Control Hearings Board, State of Washington, Matter No. PCHB No. 10-162.

49. Expert Report (June 2011) on behalf of the New Hampshire Sierra Club at the State of New Hampshire Public Utilities Commission, Docket No. 10-261 – the 2010 Least Cost Integrated Resource Plan (LCIRP) submitted by the Public Service Company of New Hampshire (re. Merrimack Station Units 1 and 2).

50. Declaration (August 2011) in the matter of the Sandy Creek Energy Associates L.P. Sandy Creek Power Plant on behalf of Sierra Club and Public Citizen. *Sierra Club, Inc. and Public Citizen, Inc. v. Sandy Creek Energy Associates, L.P.,* Civil Action No. A-08-CA-648-LY (Western District of Texas, Austin Division).

51. Expert Report (October 2011) on behalf of the Defendants in the matter of *John Quiles and Jeanette Quiles et al. v. Bradford-White Corporation, MTD Products, Inc., Kohler Co., et al.,* Case No. 3:10-cv-747 (TJM/DEP) (Northern District of New York).

52. Declaration (October 2011) on behalf of the Plaintiffs in the matter of *American Nurses Association et. al. (Plaintiffs), v. US EPA (Defendant)*, Case No. 1:08-cv-02198-RMC (US District Court for the District of Columbia).

53. Declaration (February 2012) and Second Declaration (February 2012) in the matter of *Washington Environmental Council and Sierra Club Washington State Chapter v. Washington State Department of Ecology and Western States Petroleum Association,* Case No. 11-417-MJP (Western District of Washington).

54. Expert Report (March 2012) and Supplemental Expert Report (November 2013) in the matter of *Environment Texas Citizen Lobby, Inc and Sierra Club v. ExxonMobil Corporation et al.,* Civil Action No. 4:10-cv-4969 (Southern District of Texas, Houston Division).

55. Declaration (March 2012) in the matter of *Center for Biological Diversity, et al. v. United States Environmental Protection Agency,* Case No. 11-1101 (consolidated with 11-1285, 11-1328 and 11-1336) (US Court of Appeals for the District of Columbia Circuit).

56. Declaration (March 2012) in the matter of *Sierra Club v. The Kansas Department of Health and Environment*, Case No. 11-105,493-AS (Holcomb power plant) (Supreme Court of the State of Kansas).

57. Declaration (March 2012) in the matter of the Las Brisas Energy Center *Environmental Defense Fund et al., v. Texas Commission on Environmental Quality,* Cause No. D-1-GN-11-001364 (District Court of Travis County, Texas, 261st Judicial District).

58. Expert Report (April 2012), Supplemental and Rebuttal Expert Report (July 2012), and Supplemental Rebuttal Expert Report (August 2012) on behalf of the states of New Jersey and Connecticut in the matter of the Portland Power plant *State of New Jersey and State of Connecticut (Intervenor-Plaintiff) v. RRI Energy Mid-Atlantic Power Holdings et al.,* Civil Action No. 07-CV-5298 (JKG) (Eastern District of Pennsylvania).

59. Declaration (April 2012) in the matter of the EPA's EGU MATS Rule, on behalf of the Environmental Integrity Project.

60. Expert Report (August 2012) on behalf of the United States in connection with the Louisiana Generating NSR Case. *United States v. Louisiana Generating, LLC*, 09-CV100-RET-CN (Middle District of Louisiana) – Harm Phase.

61. Declaration (September 2012) in the Matter of the Application of *Energy Answers Incinerator, Inc.* for a Certificate of Public Convenience and Necessity to Construct a 120 MW Generating Facility in Baltimore City, Maryland, before the Public Service Commission of Maryland, Case No. 9199.

62. Expert Report (October 2012) on behalf of the Appellants (Robert Concilus and Leah Humes) in the matter of Robert Concilus and Leah Humes v. Commonwealth of Pennsylvania Department of Environmental Protection and Crawford Renewable Energy, before the Commonwealth of Pennsylvania Environmental Hearing Board, Docket No. 2011-167-R.

63. Expert Report (October 2012), Supplemental Expert Report (January 2013), and Affidavit (June 2013) in the matter of various Environmental Petitioners v. North Carolina DENR/DAQ and Carolinas Cement Company, before the Office of Administrative Hearings, State of North Carolina.

64. Pre-filed Testimony (October 2012) on behalf of No-Sag in the matter of the North Springfield Sustainable Energy Project before the State of Vermont, Public Service Board.

65. Pre-filed Testimony (November 2012) on behalf of Clean Wisconsin in the matter of Application of Wisconsin Public Service Corporation for Authority to Construct and Place in Operation a New Multi-Pollutant Control Technology System (ReACT) for Unit 3 of the Weston Generating Station, before the Public Service Commission of Wisconsin, Docket No. 6690-CE-197.

66. Expert Report (February 2013) on behalf of Petitioners in the matter of Credence Crematory, Cause No. 12-A-J-4538 before the Indiana Office of Environmental Adjudication.

67. Expert Report (April 2013), Rebuttal report (July 2013), and Declarations (October 2013, November 2013) on behalf of the Sierra Club in connection with the Luminant Big Brown Case. *Sierra Club v. Energy Future Holdings Corporation and Luminant Generation Company LLC*, Civil Action No. 6:12-cv-00108-WSS (Western District of Texas, Waco Division).

68. Declaration (April 2013) on behalf of Petitioners in the matter of *Sierra Club, et al., (Petitioners) v Environmental Protection Agency et al. (Respondents),* Case No., 13-1112, (Court of Appeals, District of Columbia Circuit).

69. Expert Report (May 2013) and Rebuttal Expert Report (July 2013) on behalf of the Sierra Club in connection with the Luminant Martin Lake Case. *Sierra Club v. Energy Future Holdings Corporation and Luminant Generation Company LLC*, Civil Action No. 5:10-cv-0156-MHS-CMC (Eastern District of Texas, Texarkana Division).

70. Declaration (August 2013) on behalf of A. J. Acosta Company, Inc., in the matter of *A. J. Acosta Company, Inc., v. County of San Bernardino*, Case No. CIVSS803651.

71. Comments (October 2013) on behalf of the Washington Environmental Council and the Sierra Club in the matter of the Washington State Oil Refinery RACT (for Greenhouse Gases), submitted to the Washington State Department of Ecology, the Northwest Clean Air Agency, and the Puget Sound Clean Air Agency.

72. Statement (November 2013) on behalf of various Environmental Organizations in the matter of the Boswell Energy Center (BEC) Unit 4 Environmental Retrofit Project, to the Minnesota Public Utilities Commission, Docket No. E-015/M-12-920.

73. Expert Report (December 2013) on behalf of the United States in *United States of America v. Ameren Missouri*, Civil Action No. 4:11-cv-00077-RWS (Eastern District of Missouri, Eastern Division).

74. Expert Testimony (December 2013) on behalf of the Sierra Club in the matter of Public Service Company of New Hampshire Merrimack Station Scrubber Project and Cost Recovery, Docket No. DE 11-250, to the State of New Hampshire Public Utilities Commission.

75. Expert Report (January 2014) on behalf of Baja, Inc., in *Baja, Inc., v. Automotive Testing and Development Services, Inc. et. al*, Civil Action No. 8:13-CV-02057-GRA (District of South Carolina, Anderson/Greenwood Division).

76. Declaration (March 2014) on behalf of the Center for International Environmental Law, Chesapeake Climate Action Network, Friends of the Earth, Pacific Environment, and the Sierra Club (Plaintiffs) in the matter of *Plaintiffs v. the Export-Import Bank (Ex-Im Bank) of the United States*, Civil Action No. 13-1820 RC (District Court for the District of Columbia).

77. Declaration (April 2014) on behalf of Respondent-Intervenors in the matter of *Mexichem Specialty Resins Inc., et al., (Petitioners) v Environmental Protection Agency et al.,* Case No., 12-1260 (and Consolidated Case Nos. 12-1263, 12-1265, 12-1266, and 12-1267), (Court of Appeals, District of Columbia Circuit).

78. Direct Prefiled Testimony (June 2014) on behalf of the Michigan Environmental Council and the Sierra Club in the matter of the Application of DTE Electric Company for Authority to Implement a Power Supply Cost Recovery (PSCR) Plan in its Rate Schedules for 2014 Metered Jurisdictional Sales of Electricity, Case No. U-17319 (Michigan Public Service Commission).

79. Expert Report (June 2014) on behalf of ECM Biofilms in the matter of the US Federal Trade Commission (FTC) v. ECM Biofilms (FTC Docket #9358).

80. Direct Prefiled Testimony (August 2014) on behalf of the Michigan Environmental Council and the Sierra Club in the matter of the Application of Consumers Energy Company for Authority to Implement a Power Supply Cost Recovery (PSCR) Plan in its Rate Schedules for 2014 Metered Jurisdictional Sales of Electricity, Case No. U-17317 (Michigan Public Service Commission).

81. Declaration (July 2014) on behalf of Public Health Intervenors in the matter of *EME Homer City Generation v. US EPA* (Case No. 11-1302 and consolidated cases) relating to the lifting of the stay entered by the Court on December 30, 2011 (US Court of Appeals for the District of Columbia).

82. Expert Report (September 2014), Rebuttal Expert Report (December 2014) and Supplemental Expert Report (March 2015) on behalf of Plaintiffs in the matter of *Sierra Club and Montana Environmental Information Center (Plaintiffs) v. PPL Montana LLC, Avista Corporation, Puget Sound Energy, Portland General Electric Company, Northwestern Corporation, and Pacificorp (Defendants)*, Civil Action No. CV 13-32-BLG-DLC-JCL (US District Court for the District of Montana, Billings Division).

83. Expert Report (November 2014) on behalf of Niagara County, the Town of Lewiston, and the Villages of Lewiston and Youngstown in the matter of CWM Chemical Services, LLC New York State Department of Environmental Conservation (NYSDEC) Permit Application Nos.: 9-2934-00022/00225, 9-2934-00022/00231, 9-2934-00022/00232, and 9-2934-00022/00249 (pending).

84. *Declaration (January 2015) relating to Startup/Shutdown in the MATS Rule (EPA Docket ID No. EPA-HQ-OAR-2009-0234) on behalf of the Environmental Integrity Project.*

85. Pre-filed Direct Testimony (March 2015), Supplemental Testimony (May 2015), and Surrebuttal Testimony (December 2015) on behalf of Friends of the Columbia Gorge in the matter of the Application for a Site Certificate for the Troutdale Energy Center before the Oregon Energy Facility Siting Council.

86. Brief of Amici Curiae Experts in Air Pollution Control and Air Quality Regulation in Support of the Respondents, On Writs of Certiorari to the US Court of Appeals for the District of Columbia, No. 14-46, 47, 48. *Michigan et. al., (Petitioners) v. EPA et. al., Utility Air Regulatory Group (Petitioners) v. EPA et. al., National Mining Association et. al., (Petitioner) v. EPA et. al.,* (Supreme Court of the United States).

87. Expert Report (March 2015) and Rebuttal Expert Report (January 2016) on behalf of Plaintiffs in the matter of *Conservation Law Foundation v. Broadrock Gas Services LLC, Rhode Island LFG GENCO LLC, and Rhode Island Resource Recovery Corporation (Defendants)*, Civil Action No. 1:13-cv-00777-M-PAS (US District Court for the District of Rhode Island).

88. Declaration (April 2015) relating to various Technical Corrections for the MATS Rule (EPA Docket ID No. EPA-HQ-OAR-2009-0234) on behalf of the Environmental Integrity Project.

89. Direct Prefiled Testimony (May 2015) on behalf of the Michigan Environmental Council, the Natural Resources Defense Council, and the Sierra Club in the matter of the Application of DTE Electric Company for Authority to Increase its Rates, Amend its Rate Schedules and Rules Governing the Distribution and Supply of Electric Energy and for Miscellaneous Accounting Authority, Case No. U-17767 (Michigan Public Service Commission).

90. Expert Report (July 2015) and Rebuttal Expert Report (July 2015) on behalf of Plaintiffs in the matter of *Northwest Environmental Defense Center et. al., v. Cascade Kelly Holdings LLC, d/b/a Columbia Pacific Bio-Refinery, and Global Partners LP (Defendants)*, Civil Action No. 3:14-cv-01059-SI (US District Court for the District of Oregon, Portland Division).

91. Declaration (August 2015, Docket No. 1570376) in support of "Opposition of Respondent-Intervenors American Lung Association, et. al., to Tri-State Generation's Emergency Motion;" Declaration (September 2015, Docket No. 1574820) in support of "Joint Motion of the State, Local Government, and Public Health Respondent-Intervenors for Remand Without Vacatur;" Declaration (October 2015) in support of "Joint Motion of the State, Local Government, and Public Health Respondent-Intervenors to State and Certain Industry Petitioners' Motion to Govern, *White Stallion Energy Center, LLC v. US EPA*, Case No. 12-1100 (US Court of Appeals for the District of Columbia).

92. Declaration (September 2015) in support of the Draft Title V Permit for Dickerson Generating Station (Proposed Permit No 24-031-0019) on behalf of the Environmental Integrity Project.

93. Expert Report (Liability Phase) (December 2015) and Rebuttal Expert Report (February 2016) on behalf of Plaintiffs in the matter of *Natural Resources Defense Council, Inc., Sierra Club, Inc., Environmental Law and Policy Center, and Respiratory Health Association v. Illinois Power Resources LLC, and Illinois Power Resources Generating LLC (Defendants)*, Civil Action No. 1:13-cv-01181 (US District Court for the Central District of Illinois, Peoria Division).

94. Declaration (December 2015) in support of the Petition to Object to the Title V Permit for Morgantown Generating Station (Proposed Permit No 24-017-0014) on behalf of the Environmental Integrity Project.

95. Expert Report (November 2015) on behalf of Appellants in the matter of *Sierra Club, et al. v. Craig W. Butler, Director of Ohio Environmental Protection Agency et al.,* ERAC Case No. 14-256814.

96. Affidavit (January 2016) on behalf of Bridgewatch Detroit in the matter of *Bridgewatch Detroit v. Waterfront Petroleum Terminal Co., and Waterfront Terminal Holdings, LLC.*, in the Circuit Court for the County of Wayne, State of Michigan.

97. Expert Report (February 2016) and Rebuttal Expert Report (July 2016) on behalf of the challengers in the matter of the Delaware Riverkeeper Network, Clean Air Council, et. al., vs. Commonwealth of Pennsylvania Department of Environmental Protection and R. E. Gas Development LLC regarding the Geyer well site before the Pennsylvania Environmental Hearing Board.

98. Direct Testimony (May 2016) in the matter of Tesoro Savage LLC Vancouver Energy Distribution Terminal, Case No. 15-001 before the State of Washington Energy Facility Site Evaluation Council.

99. Declaration (June 2016) relating to deficiencies in air quality analysis for the proposed Millenium Bulk Terminal, Port of Longview, Washington.

100. Declaration (December 2016) relating to EPA's refusal to set limits on PM emissions from coal-fired power plants that reflect pollution reductions achievable with fabric filters on behalf of Environmental Integrity Project, Clean Air Council, Chesapeake Climate Action Network, Downwinders at Risk represented by Earthjustice in the matter of *ARIPPA v EPA, Case No. 15-1180.* (D.C. Circuit Court of Appeals).

101. Expert Report (January 2017) on the Environmental Impacts Analysis associated with the Huntley and Huntley Poseidon Well Pad on behalf citizens in the matter of the special exception use Zoning Hearing Board of Penn Township, Westmoreland County, Pennsylvania.

102. Expert Report (January 2017) on the Environmental Impacts Analysis associated with the Apex Energy Backus Well Pad on behalf citizens in the matter of the special exception use Zoning Hearing Board of Penn Township, Westmoreland County, Pennsylvania.

103. Expert Report (January 2017) on the Environmental Impacts Analysis associated with the Apex Energy Drakulic Well Pad on behalf citizens in the matter of the special exception use Zoning Hearing Board of Penn Township, Westmoreland County, Pennsylvania.

104. Expert Report (January 2017) on the Environmental Impacts Analysis associated with the Apex Energy Deutsch Well Pad on behalf citizens in the matter of the special exception use Zoning Hearing Board of Penn Township, Westmoreland County, Pennsylvania.

105. Affidavit (February 2017) pertaining to deficiencies water discharge compliance issues at the Wood River Refinery in the matter of *People of the State of Illinois (Plaintiff) v. Phillips 66 Company, ConocoPhillips Company, WRB Refining LP (Defendants)*, Case No. 16-CH-656, (Circuit Court for the Third Judicial Circuit, Madison County, Illinois).

106. Expert Report (March 2017) on behalf of the Plaintiff pertaining to non-degradation analysis for waste water discharges from a power plant in the matter of *Sierra Club (Plaintiff) v. Pennsylvania Department of Environmental Protection (PADEP) and Lackawanna Energy Center*, Docket No. 2016-047-L (consolidated), (Pennsylvania Environmental Hearing Board).

107. Expert Report (March 2017) on behalf of the Plaintiff pertaining to air emissions from the Heritage incinerator in East Liverpool, Ohio in the matter of *Save our County (Plaintiff) v. Heritage Thermal Services, Inc. (Defendant), Case No. 4:16-CV-1544-BYP*, (US District Court for the Northern District of Ohio, Eastern Division).

108. Rebuttal Expert Report (June 2017) on behalf of Plaintiffs in the matter of *Casey Voight and Julie Voight (Plaintiffs) v Coyote Creek Mining Company LLC (Defendant),* Civil Action No. 1:15-CV-00109 (US District Court for the District of North Dakota, Western Division).

109. Expert Affidavit (August 2017) and Penalty/Remedy Expert Affidavit (October 2017) on behalf of Plaintiff in the matter of *Wildearth Guardians (Plaintiff) v Colorado Springs Utility Board (Defendant,)* Civil Action No. 1:15-cv-00357-CMA-CBS (US District Court for the District of Colorado).

110. Expert Report (August 2017) on behalf of Appellant in the matter of *Patricia Ann Troiano (Appellant) v. Upper Burrell Township Zoning Hearing Board (Appellee)*, Court of Common Pleas of Westmoreland County, Pennsylvania, Civil Division.

111. Expert Report (October 2017), Supplemental Expert Report (October 2017), and Rebuttal Expert Report (November 2017) on behalf of Defendant in the matter of *Oakland Bulk and Oversized Terminal (Plaintiff) v City of Oakland (Defendant,)* Civil Action No. 3:16-cv-07014-VC (US District Court for the Northern District of California, San Francisco Division).

112. Declaration (December 2017) on behalf of the Environmental Integrity Project in the matter of permit issuance for ATI Flat Rolled Products Holdings, Breckenridge, PA to the Allegheny County Health Department.

113. Expert Report (Harm Phase) (January 2018), Rebuttal Expert Report (Harm Phase) (May 2018) and Supplemental Expert Report (Harm Phase) (April 2019) on behalf of Plaintiffs in the matter of *Natural Resources Defense Council, Inc., Sierra Club, Inc., and Respiratory Health Association v. Illinois Power Resources LLC, and Illinois Power Resources Generating LLC (Defendants)*, Civil Action No. 1:13-cv-01181 (US District Court for the Central District of Illinois, Peoria Division).

114. Declaration (February 2018) on behalf of the Chesapeake Bay Foundation, et. al., in the matter of the Section 126 Petition filed by the state of Maryland in *State of Maryland v. Pruitt (Defendant)*, Civil Action No. JKB-17-2939 (Consolidated with No. JKB-17-2873) (US District Court for the District of Maryland).

115. Direct Pre-filed Testimony (March 2018) on behalf of the National Parks Conservation Association (NPCA) in the matter of *NPCA v State of Washington, Department of Ecology and BP West Coast Products, LLC*, PCHB No. 17-055 (Pollution Control Hearings Board for the State of Washington.

116. Expert Affidavit (April 2018) and Second Expert Affidavit (May 2018) on behalf of Petitioners in the matter of *Coosa River Basin Initiative and Sierra Club (Petitioners) v State of Georgia Environmental Protection Division, Georgia Department of Natural Resources (Respondent) and Georgia Power Company (Intervenor/Respondent)*, Docket Nos: 1825406-BNR-WW-57-Howells and 1826761-BNR-WW-57-Howells, Office of State Administrative Hearings, State of Georgia.

117. Direct Pre-filed Testimony and Affidavit (December 2018) on behalf of Sierra Club and Texas Campaign for the Environment (Appellants) in the contested case hearing before the Texas State Office of Administrative Hearings in Docket Nos. 582-18-4846, 582-18-4847 (Application of GCGV Asset Holding, LLC for Air Quality Permit Nos. 146425/PSDTX1518 and 146459/PSDTX1520 in San Patricio County, Texas).

118. Expert Report (February 2019) on behalf of Sierra Club in the State of Florida, Division of Administrative Hearings, Case No. 18-2124EPP, Tampa Electric Company Big Bend Unit 1 Modernization Project Power Plant Siting Application No. PA79-12-A2.

119. Declaration (March 2019) on behalf of Earthjustice in the matter of comments on the renewal of the Title V Federal Operating Permit for Valero Houston refinery.

120. Expert Report (March 2019) on behalf of Plaintiffs for Class Certification in the matter of *Resendez et al v Precision Castparts Corporation* in the Circuit Court for the State of Oregon, County of Multnomah, Case No. 16cv16164.

121. Expert Report (June 2019), Affidavit (July 2019) and Rebuttal Expert Report (September 2019) on behalf of Appellants relating to the NPDES permit for the Cheswick power plant in the matter of *Three Rivers Waterkeeper and Sierra Club (Appellants) v. State of Pennsylvania Department of Environmental Protection (Appellee) and NRG Power Midwest (Permittee)*, before the Commonwealth of Pennsylvania Environmental Hearing Board, EHB Docket No. 2018-088-R.

122. Affidavit/Expert Report (August 2019) relating to the appeal of air permits issued to PTTGCA on behalf of Appellants in the matter of *Sierra Club (Appellants) v. Craig Butler, Director, et. al., Ohio EPA (Appellees)* before the State of Ohio Environmental Review Appeals Commission (ERAC), Case Nos. ERAC-19-6988 through -6991.

123. Expert Report (October 2019) relating to the appeal of air permit (Plan Approval) on behalf of Appellants in the matter of *Clean Air Council and Environmental Integrity Project (Appellants) v. Commonwealth of Pennsylvania Department of Environmental Protection and Sunoco Partners Marketing and Terminals L.P.*, before the Commonwealth of Pennsylvania Environmental Hearing Board, EHB Docket No. 2018-057-L.

124. Expert Report (December 2019), Affidavit (March 2020), Supplemental Expert Report (July 2020), and Declaration (February 2021) on behalf of Earthjustice in the matter of *Objection to the*

Issuance of PSD/NSR and Title V permits for Riverview Energy Corporation, Dale, Indiana, before the Indiana Office of Environmental Adjudication, Cause No. 19-A-J-5073.

125. Affidavit (December 2019) on behalf of Plaintiff-Intervenor (Surfrider Foundation) in the matter of *United States and the State of Indiana (Plaintiffs), Surfrider Foundation (Plaintiff-Intervenor), and City of Chicago (Plaintiff-Intervenor) v. United States Steel Corporation (Defendant),* Civil Action No. 2:18-cv-00127 (US District Court for the Northern District of Indiana, Hammond Division).

126. Declarations (January 2020, February 2020, May 2020, July 2020, and August 2020) and Pre-filed Testimony (April 2021) in support of Petitioner's Motion for Stay of PSCAA NOC Order of Approval No. 11386 in the matter of the *Puyallup Tribe of Indians v. Puget Sound Clean Air Agency (PSCAA) and Puget Sound Energy (PSE),* before the State of Washington Pollution Control Hearings Board, PCHB No. P19-088.

127. Expert Report (April 2020) on behalf of the plaintiff in the matter of Orion Engineered Carbons, GmbH (Plaintiff) vs. Evonik Operations, GmbH (formerly Evonik Degussa GmbH) (Respondent), before the German Arbitration Institute, Case No. DIS-SV-2019-00216.

128. Expert Independent Evaluation Report (June 2020) for *PacifiCorp's Decommissioning Costs Study Reports dated January 15, 2020 and March 13, 2020 relating to the closures of the Hunter, Huntington, Dave Johnston, Jim Bridger, Naughton, Wyodak, Hayden, and Colstrip (Units 3&4) plants*, prepared for the Oregon Public Utility Commission (Oregon PUC).

129. Direct Pre-filed Testimony (July 2020) on behalf of the Sierra Club in the matter of *the Application of the Ohio State University for a certificate of Environmental Compatibility and Public Need to Construct a Combined Heat and Power Facility in Franklin County, Ohio*, before the Ohio Power Siting Board, Case No. 19-1641-EL-BGN.

130. Expert Report (August 2020) and Rebuttal Expert Report (September 2020) on behalf of WildEarth Guardians (petitioners) in the matter of *the Appeals of the Air Quality Permit No. 7482-M1 Issued to 3 Bear Delaware Operating – NM LLC (EIB No. 20-21(A) and Registrations Nos. 8729, 8730, and 8733 under General Construction Permit for Oil and Gas Facilities (EIB No. 20-33 (A)*, before the State of New Mexico, Environmental Improvement Board.

131. Expert Report (July 2020) on the *Initial Economic Impact Analysis (EIA) for A Proposal To* Regulate *NOx Emissions from Natural Gas Fired Rich-Burn Natural Gas Reciprocating Internal Combustion Engines (RICE) Greater Than 100 Horsepower* prepared on behalf of Earthjustice and the National Parks Conservation Association in the matter of Regulation Number 7, Alternate Rules before the Colorado Air Quality Control Commission.

132. Expert Report (August 2020) and Supplemental Expert Report (February 2021) on the Potential Remedies to Avoid Adverse Thermal Impacts from the Merrimack Station on behalf of Plaintiffs in the matter of *Sierra Club Inc. and the* Conservation *Law Foundation (Plaintiffs) v. Granite Shore Power, LLC et. al., (Defendants)*, Civil Action No. 19-cv-216-JL (US District Court for the District of New Hampshire.)

133. Expert Report (August 2020) and Supplemental Expert Report (December 2020) on behalf of Plaintiffs in the matter of *PennEnvironment Inc., and Clean Air Council (Plaintiffs) and Allegheny County Health Department (Plaintiff-Intervenor) v. United States Steel Corporation (Defendant)*, Civil Action No. 2-19-cv-00484-MJH (US District Court for the Western District of Pennsylvania.)

134. Pre-filed Direct Testimony (October 2020) and Sur-rebuttal Testimony (November 2020) on behalf of petitioners (Ten Persons Group, including citizens, the Town of Braintree, the Town of Hingham, and the City of Quincy) in the matter of Algonquin Gas Transmission LLC, Weymouth MA, No. X266786 Air Quality Plan Approval, before the Commonwealth of Massachusetts, Department of Environmental Protection, the Office of Appeals and Dispute Resolution, OADR Docket Nos. 2019-008, 2019-009, 2019010, 2019-011, 2019-012 and 2019-013.

135. Expert Report (November 2020) on behalf of Protect PT in the matter of *Protect PT v. Commonwealth of Pennsylvania Department of Environmental Protection and Apex Energy (PA) LLC*, before the Commonwealth of Pennsylvania Environmental Hearing Board, Docket No. 2018-080-R (consolidated with 2019-101-R)(the "Drakulic Appeal").

136. Expert Report (December 2020) on behalf of Plaintiffs in the matter of *Sierra Club Inc. (Plaintiff) v. GenOn Power Midwest LP (Defendants)*, Civil Action No. 2-19-cv-01284-WSS (US District Court for the Western District of Pennsylvania.)

137. Pre-filed Testimony (January 2021) on behalf of the Plaintiffs (Shrimpers and Fishermen of the Rio Grande Valley represented by Texas RioGrande Legal Aid, Inc.) in the matter of the Appeal of Texas Commission on Environmental Quality (TCEQ) Permit Nos. 147681, PSDTX1522, GHGPSDTX172 for the Jupiter Brownsville Heavy Condensate Upgrader Facility, Cameron County, before the Texas State Office of Administrative Hearings, SOAH Docket No. 582-21-0111, TCEQ Docket No. 2020-1080-AIR.

138. Expert Reports (March 2021 and May 2021) regarding the Aries Newark LLC Sludge Processing Facility, Application No. CPB 20-74, Central Planning Board, City of Newark, New Jersey.

139. Expert Report (April 2021) for *Charles Johnson Jr. (Plaintiff) v. BP Exploration and Production Inc., et. al. (Defendant),* Civil Action No. 2:20-CV-01329 (Related to 12-968 BELO in MDL No. 2179). (US District Court for the Eastern District of Louisiana, New Orleans Division).

140. Affidavit (April 2021) for *Clayton Faerber et.al., (Plaintiff), v. BP Exploration and Production Inc., et. al. (Defendant)*, Civil Action No. 20-CV-00328 01329 (Related to 12-968 BELO in MDL No. 2179). (US District Court for the Southern District of Mississippi).

141. Expert Report (April 2021, June 2023) for *Floyd Ruffin (Plaintiff), v. BP Exploration and Production Inc., et. al. (Defendant)*, Civil Action No. 2:20-cv-00334-CJB-JCW (US District Court for the Eastern District of Louisiana, New Orleans Division).

142. Expert Report (April 2021) and Sur-Rebuttal Report (June 2021) on behalf of the Plaintiffs in the matter of *Modern Holdings, LLC, et al. (Plaintiffs) v. Corning Inc., et al. (Defendants)*, Civil Action No. 5:13-cv-00405-GFVT, (US District Court for the Eastern District of Kentucky, Central Division at Lexington).

143. Expert Report (May 2021) for *Clifford Osmer (Plaintiff) v. BP Exploration and Production Inc., et. al., (Defendants)* related to No. 18-CV-12557 (US District Court for the Eastern District of Louisiana).

144. Expert Report (May 2021) and Rebuttal Expert Report (January 2022) for *James Noel (Plaintiff) v. BP Exploration and Production Inc., et. al. (Defendant),* Civil Action No. 1:19-CV-00694-JB-MU-C (US District Court for the Southern District of Alabama, Southern Division).

145. Expert Report (June 2021) and Declarations (May 2021 and June 2021) on behalf of Plaintiffs in the matter of *Sierra Club (Plaintiff) v. Woodville Pellets, LLC (Defendant)*, Civil Action No. 9:20-cv-00178-MJT (US District Court for the Eastern District of Texas, Lufkin Division.)

146. Expert Witness Disclosure (June 2021) on behalf of the Plaintiffs in the matter of *Jay Burdick, et. al., (Plaintiffs) v. Tanoga Inc. (d/b/a Taconic) (Defendant)*, Index No. 253835, (State of New York Supreme Court, County of Rensselaer).

147. Expert Report (June 2021) on behalf of Appellants in the matter of *PennEnvironment and Earthworks (Appellants) v. Commonwealth of Pennsylvania Department of Environmental Protection (Appellee) and MarkWest Liberty Midstream and resource, LLC (Permittee)*, before the Commonwealth of Pennsylvania Environmental Hearing Board, EHB Docket No. 2020-002-R.

148. Expert Report (June 2021) for *Antonia Saavedra-Vargas (Plaintiff) v. BP Exploration and Production Inc., et. al. (Defendant)*, Civil Action No. 2:18-CV-11461 (US District Court for the Eastern District of Louisiana, New Orleans Division).

149. Affidavit (June 2021) for Lourdes Rubi in the matter of *Lourdes Rubi (Plaintiff) v. BP Exploration and Production Inc., et. al., (Defendants)*, related to 12-968 BELO in MDL No. 2179 (US District Court for the Eastern District of Louisiana, New Orleans Division).

150. Expert Report (June 2021) for *Wallace Smith (Plaintiff) v. BP Exploration and Production Inc., et. al. (Defendant)*, Civil Action No. 2:19-CV-12880 (US District Court for the Eastern District of Louisiana, New Orleans Division).

151. Declaration (July 2021) on behalf of Plaintiffs in the matter of *Stephanie Mackey and Nick Migliore, on behalf* of *themselves and all others similarly situated (Plaintiffs) v. Chemtool Inc. and Lubrizol Corporation (Defendants)*, Case No. 2021-L-0000165, State of Illinois, Circuit Court of the 17th Judicial Circuit, Winnebago County.

152. Declaration (July 2021, August 2021) on behalf of Petitioners in the matter of the Petition for a Hearing on the Merits Regarding Air Quality Permit No. 3340-RMD issued to New Mexico Terminal Services, LLC by *Mountain View Neighborhood Association et. al., (Petitioners) v. City of Albuquerque Environmental Health Department*, AQCB Petition No. 2020-1 before the Albuquerque-Bernalillo County Air Quality Control Board.

153. Expert Disclosure (September 2021), Affidavit (May 2023), and Affirmation (May 2024) on behalf of the Plaintiffs in the matter of *State of New York, Town of Hempstead, Town of Brookhaven, Incorporated Village of Garden City and Long Island Power Authority et. al., (Plaintiffs) v. Covanta Hempstead Company et. al., (Defendants)*, Index No. 7549/2013 before the Supreme Court of the State of New York, County of Nassau.

154. Expert Report (October 2021) for *John A. Battiste (Plaintiff) v. BP Exploration and Production Inc., et. al. (Defendant),* Civil Action No. 1:21-CV-00118 (US District Court for the Southern District of Alabama, Mobile Division)

155. Declaration/Expert Report (October 2021) for *Charles K. Grasley et. al., (Plaintiffs) v. Chemtool Incorporated (Defendant)*, Case No. 2021-L-0000162 (State of Illinois, In the Circuit Court of the 17th Judicial Circuit, Winnebago County).

156. Declaration (October 2021) and Expert Report (November 2021) on behalf of the Plaintiffs in the matter of Toll Brothers, Inc., and Porter Ranch Development Company (Plaintiffs) v. Sempra Energy, Southern California Gas Company et. al., (Defendants), Southern California [Aliso Canyon] Gas Leak Cases, JCCP No.: 4861, Lead Case No.: BC674622, Superior Court of the State of California for the County of Los Angeles.

157. Expert Report (November 2021) and Declaration (September 2022) on behalf of Plaintiffs in Re: Deepwater Horizon BELO Cases, Case No. 3:19cv963-MCR-GRJ (US District Court for the Northern District of Florida, Pensacola Division).

158. Declaration (November 2021) for the *United States of America and the State of Kansas, Department of Health and Environment (Plaintiffs) v. Coffeyville Resources Refining & Marketing, LLC (Defendant)*, Civ. No. 6:04-cv-01064-JAR-KGG (US District Court for the District of Kansas).

159. Expert Report/Affidavit (December 2021) on behalf of the City of Detroit in the matter of Marathon Petroleum Company (Claimant) v. City of Detroit Building Safety Engineering and Environmental Department, BSEED Case No. MCR 2018-2525, DAH Appeal No. 21-SWA-01, before the State of Michigan, City of Detroit Department of Appeals and Hearings.

160. Expert Report (December 2021) for *John Pabst (Plaintiff) v. BP Exploration and Production Inc., et. al. (Defendant)*, Civil Action No. 21-CV-00290 (US District Court for the Eastern District of Louisiana).

161. Expert Report (December 2021) for *Audrey Annette Tillery-Perdue individually and as person representative of the estate of Eddie Lewis Perdue (Plaintiff) v. BP Exploration and Production Inc., et. al., (Defendant)*, Civil Action No. 5:19-cv-00052-MCR-GRJ (US District Court for the Northern District of Florida, Pensacola Division).

162. Expert Report (February 2022) for *Richard Dufour (Plaintiff) v. BP Exploration and Production Inc., et. al. (Defendant)*, Civil Action No. 19-cv-00591 (US District Court for the Southern District of Mississippi).

163. Expert Report (February 2022) and Rebuttal Expert Report (June 2022, in preparation) for *Kamuda (Plaintiff) v. Sterigenics U.S., LLC, et. al., (Defendant)*, Case No. 2018-L-010475 (Circuit Court of Cook County, Illinois).

164. Expert Report (February 2022) in the matter of the *Appeal Petition for Hearing on Air Quality Permit No. 8585 on behalf of Earth Care New Mexico et. al., (Petitioners) v. New Mexico Environment Department and Associated Asphalt and Materials, LLC (Applicant),* No. EIB 21-48 before the State of New Mexico Environmental Improvement Board.

165. Expert Report (March 2022), Affidavit (June 2022), Supplemental Expert Report (April 2023) in the matter of *Clean Air Council et. al., (Appellants) v. Commonwealth of Pennsylvania, Department of Environmental Protection (Appellee) and Renovo Energy Center (Permittee)* EHB Docket No. 2021-055-R before the Commonwealth of Pennsylvania Environmental Hearing Board.

166. Declaration (March 2022) in the matter of Max Midstream Texas LLC Air Quality Permit No. 162941 for the Seahawk Crude Condensate Terminal in Calhoun County Texas, TCEQ Docket No. 2022-0157-AIR, before the Texas Commission on Environmental Quality.

167. Expert Pre-filed Testimony (April 2022) in the matter of Application of TPC Group LLC for New State and PSD Air Quality Permits (various), TCEQ Docket No. 2021-1422-AIR, SOAH Docket No. 582-22-0799, Before the Texas State Office of Administrative Hearings.

168. Expert Report (April 2022) and Rebuttal Report (August 2022) for *Teresa Fornek (Plaintiff) v. Sterigenics U.S., LLC, et. al., (Defendant)*, Case No. 2018-L-010744 (Circuit Court of Cook County, Illinois.)

169. Rule 26 Disclosure (May 2022) in the matter of the *Water Works and Sewer Board of the City of Gadsden (*Plaintiff*) v. 3M Company, et. al., (Defendants)*, Civil Action No.: 31 CV-2016-900676.00 (Circuit County of Etowah County, Alabama)

170. Expert Report (June 2022) for *Heather Schumacher (Plaintiff) v. Sterigenics U.S., LLC, et. al., (Defendant)*, Case No. 2018-L-011939 (Circuit Court of Cook County, Illinois.)

171. Expert Report (June 2022), Rebuttal Reports (August 2022, September 2022) for Plaintiffs in *Phylliss Grayson et. al. (Plaintiffs), v Lockheed Martin Corporation (Defendant),* Case No. 6:20-cv-01770. (US District Court for the Middle District of Florida – Orlando Division.)

172. Expert Affidavit (July 2022) for Center for Environmental Rights in connection with the 2019 South Africa Integrated Resource Plan in *African Climate Alliance et. al. v. The Minister of Mineral Resources and Energy et. al.*, in the High Court of South Africa, Gauteng Division, Pretoria.

173. Expert Affidavit (July 2022) for Center for Environmental Rights in connection with the Limpopo Mine (Lephalale Coal Mines Ltd.) in *Earthlife Africa v. The Minister of Forestry, Fisheries and Environment et. al.*, in the High Court of South Africa, Gauteng Division, Pretoria, Case No. 9149/2022.

174. Pre-filed Testimony (July 2022) and Rebuttal Testimony (September 2020) on behalf of the Puyallup Tribe of Indians in the matter of *Washington Utilities and Transportation Commission (Complainant) v. Puget Sound Energy (Respondent)* before the Washington Utilities and Transportation Commission, Docket UE-220066 and UG-220067 (Consolidated).

175. Expert Report (September 2022) *Clean Air Council, Citizens for Pennsylvania's Future, Mountain Watershed Association (Appellants) v. Allegheny County Health Department (Appellee) and Allegheny Energy Center (*Intervenor*, Permittee),* Case No. 21-043 before the Hearing Officer of the Allegheny County Health Department.

176. Expert Affidavit (October 2022) for *Concerned Citizens of Cook County GA (Petitioner) v. Georgia Department of Natural Resources (Respondent) and Spectrum Energy Georgia, LLC (Respondent Intervenor)* before the Office of State Administrative Hearings, State of Georgia, Docket No: 2303405-OSAH-BNR-AQ-37-Barnes.

177. Expert Rebuttal Report (January 2023), Supplemental Rebuttal Expert Report (March 2023, May 2023, November 2023) for *Ann Jordan et. al., and Blake Darnell (Plaintiffs) v. Terumo BCT et. al., (Defendants)* before District Court, Jefferson County, Colorado Case Numbers: 2020CV031457, 2021CV030474 (consolidated with 2020CV031457) and 2020CV03148.

178. Expert Report (January 2023) and Rebuttal Expert Report (April 2023) for *Potomac Riverkeeper and Sierra Club (Plaintiffs) v. Virginia Electric and Power Company (Defendant)*, Civil Action No. 2:21-CV-23 (Kleeh) (US District Court for the Northern District of West Virginia, Elkins Division).

179. Affidavit (January 2023) for *Richard Dufour (Plaintiff), v. BP Exploration and Production Inc., et. al. (Defendant)*, Civil Action No. 1:19-cv-00591-HSO-BWR (Related to 12-968 BELO in MDL No. 2179). (US District Court for the Southern District of Mississippi).

180. Expert Report (January 2023) and Supplemental Expert Report (July 2023) on behalf of Plaintiffs in the matter of *Stephanie* Mackey *et. al., (Plaintiffs) v. Chemtool Inc. et. al., (Defendants) and Holian Insulation Company Inc. (Third-party Defendant)*, Case No.: 3:21-cv-50283, U.S. District Court, Northern District of Ilinois, Western Division.

181. Expert Report (February 2023) for *Vervicia Henderson, et al. (Plaintiff) v. Lockheed Martin Corporation (Defendant)*, Case No. 6:21-cv-01363, U.S. District Court, Middle District of Florida, Orlando Division.

182. Expert Report (February 2023) for *Carol Davis (Plaintiff) v. Lockheed Martin Corporation (*Defendant*)*, Case No. 6:22-cv-81-RBD-EJK, U.S. District Court, Middle District of Florida, Orlando Division.

183. Expert Report (February 2023) for Mark Letart (Plaintiff), et al. v. Union Carbide Corporation, et al. (Defendants), Case No. 2:19-cv-877, U.S. District Court, Southern District of West Virginia, Charleston Division.

184. Affidavit (March 2023) on behalf of plaintiffs in the matter of the *State of New Mexico, ex rel. Raul Torrez, Attorney General (Plaintiffs) v. Sterigenics US LLC, Sotera Health Holdings, LLC, Sotera Health LLC and Sotera Health Company (Defendants)*, Case No.: D-307-CV-2020-02629, State of New Mexico, Third Judicial District Court, County of Dona Ana

185. Pre-filed Direct Testimony (March 2023) in the matter of *Algonquin Gas Transmission LLC., on behalf of Community Residents (*Petitioners*)*, Commonwealth of Massachusetts Department of Environmental Protection, Office of Appeals and Dispute Resolution, OADR Docket Nos. 2017-011 and 012, Waterways Application License No. W16-4600, Weymouth Mass.

186. Declaration (April 2023) in the matter of Sierra Club (Plaintiff) v. Tennessee Valley Authority in the matter of the Johnsonville Aeroderivative Combustion Turbines Project, Case No.: 3:22-cv-1054, U.S>, District Court, Middle District of Tennessee, Nashville Division.

187. Expert Report (May 2023/June 2023), Affidavit (April 2023) and Declaration (July 2023) for *Ezequiel Caraballo-Pache (Plaintiff) v. BP Exploration and Production Inc., et. al. (Defendant)*, Civil Action No. 8:20-cv-00263-SCB-JSS (US District Court for the Middle District of Florida, Tampa Division).

188. Affidavit (May 2023) for *Lawrence Tucei (Plaintiff), v. BP Exploration and Production Inc., et. al. (Defendant)*, Civil Action No. 1:22-cv-00078-HSO-BWR (US District Court for the Southern District of Mississippi).

189. Expert Report (May 2023/June 2023) for *Vincent Culliver (Plaintiff), v. BP Exploration and Production Inc., et. al. (Defendant)*, Civil Action No. 3:21-cv-4942-MCR/HTC (US District Court for the Northern District of Florida).

190. Expert Report (June 2023) for *Matthew Williams (Plaintiff), v. BP Exploration and Production Inc., et. al. (Defendant)*, Civil Action No. 1:22-cv-00278-LG-BWR (US District Court for the Southern District of Mississippi).

191. Declaration (June 2023) in support of public commenters relating to the Michigan Department of Environment Great Lakes and Energy (EGLE)'s Annual Network Monitoring Plan 2024.

192. Expert Report (July 2023) and Rebuttal Expert Report (September 2023) relating to Greenhouse Gas and Energy Management (GEMM2) for Manufacturing in Colorado (September 2023) on behalf of Environmental Defense Fund.

193. Pre-filed Direct Testimony (July 2023) on behalf of Citizens for Environmental Justice in the matter of the permit Application of Valero Refining-Texas, LP for Modification to State and Prevention of Significant Deterioration Air Quality Permits No. 38754 and PSDTX324M15 before the Texas State Office of Administrative Hearings, SOAH Docket No. 582-23-14975, TCEQ Docket No. 2023-0203-AIR.

194. Declaration (August 2023) in support of comments by Environmental Defense Fund in connection with the "Good Neighbor Plan" for the 2015 Ozone National Ambient Air Quality Standards, published at 88 Fed. Reg. 36,654 (June 5, 2023) ("Final Rule"), Docket ID No. EPA-HQ-OAR-2021-0668.

195. Expert Report (August 2023) on behalf of Appellants in the matter of *PennEnvironment and Sierra Club (Appellants) v. Commonwealth of Pennsylvania, Department of Environmental Protection, (Appellee), and PPG Industries, Inc. (Permittee)*, EHB Docket No. 2022-032-B. Environmental Hearing Board, Department of Environmental Protection, State of Pennsylvania.

196. Pre-filed Testimony (September 2023) and Cross Answering Testimony (October 2023) on behalf of the Puyallup Tribe of Indians in the matter of *Washington Utilities and Transportation Commission (Complainant) v. Puget Sound Energy (Respondent)*, Docket: UG-230393. Before the Washington Utilities and Transportation Commission.

197. Expert Report (December 2023) on behalf of plaintiffs in the matter of *PennEnvironment and Sierra Club (Plaintiffs) v. PPG Industries, Inc. (Defendant)*. Case No.: Civil Action Nos. 2:12-cv-00342, 2:12-cv-00527, 2:13-cv-01395, 1:13-cv-01396, 2:14cv-00229 (consolidated). U.S. District Court Western District of Pennsylvania.

198. Expert Report (December 2023) and Rebuttal Expert Report (June 2024) on behalf of the plaintiff in the matter of *Jennifer Perrotti (Plaintiff) v. Lockheed Martin Corporation (Defendant).* Case No. 6:22-cv-01338 in the U.S. District Court Middle District of Florida – Orlando Division.

199. Expert Report (Tranche 1 - January 2024, Tranche 2 – May 2024, Tranche 3 – June 2024) and Rebuttal Report (Tranche 1 – June 2024), Third Supplemental/Rebuttal Report (January 8, 2025) on behalf of the plaintiffs in the matter of *Emily Glass et. al., (Plaintiff) v. B. Braun Medical Inc., et. al., (Defendants).* Case No. 00315 (May Term 2021) and Consolidated Cases in the First Judicial District of Pennsylvania Court of Common Pleas of Philadelphia County.

200. Expert Report (February 2024) and Supplemental Expert Report (March 2024) on behalf of the plaintiff in the matter of *Kathleen Koch (Plaintiff) v. Medline Industries, Inc. et. al. and Vantage Specialty Chemicals, Inc. (Defendants)*. Case No. 2320 L 000686 in the Circuit Court of Cook County, IL.

201. Expert Report (April 2024 and August 2024) on behalf of the plaintiff in the matter of *Paula Johnson et. al., (Plaintiff) v. Prairie Farms Dairy, Inc. et. al., (Defendants).* Case No. 2017 L 001562 in the Circuit Court, Third Judicial Circuit Madison County, Illinois.

202. Expert Report (Phase I: April 2024) and Expert Report (Phase II: March 18, 2025) on behalf of the plaintiffs in the matter of *Tom Mutz et al., (Plaintiffs) v. Sterigenics US, LLC (Defendants).* Civil Action File No. 20-A-3448 in the State Court of Cobb County, State of Georgia. Additional Related Cases: Emma J. Bonner 21-A2420; Mary Ann Harrell 21-A4396.

203. Expert Report (April 2024), Declaration (August 2024) and Rebuttal Expert Report (November 2024) on behalf of the plaintiff in the matter of *United States of America (plaintiff) v. EES Coke Battery, LLC (Defendant)*. Civil Action No. 22-11191 in the US District Court for the Eastern District of Michigan.

204. Affidavit on behalf of the petitioner (April 2024) in the matter of Dr. Darren Masier (Petitioner) v. North Carolina State University (Expected Adverse Party). File No. 24CV013058-910 in the General Court of Justice, Superior Court Division, Wake County, North Carolina.

205. Affirmation (June 2024) on behalf of the petitioners in the matter of Gwendolyn Harris et. al. (Petitioners) v. Marie Therese Dominguez (Commissioner of the New York State Department of Transportation) et. al., (Respondents) in the Supreme Court of the State of New York, County of Erie relating to the Kensington Expressway.

206. Expert Report (July 2024) on behalf of the Plaintiff in the matter of *Mourad Abdelaziz et. al., (Plaintiff) v. B. Braun Medical Inc., (Defendant).* Case No. 2020-C-1984 in the Pennsylvania Court of Common Pleas, Lehigh County.

207. Prefiled Direct Testimony (August 2024) on behalf of *Sierra Club and Portland Citizens United in the matter of the permit Application by Corpus Christie Liquefaction LLC* for Air Quality Permit Nos. 105710 and PSDTX1306M1 before the Texas State Office of Administrative Hearings, SOAH Docket No. 582-24-14373, TCEQ Docket No. 2023-1474-AIR.

208. Expert Report (August 2024) on behalf of the Plaintiff in the matter of *Pamela Knobbe (Plaintiff) v. Isomedix Operations, Inc., and Cosmed Group, Inc. (Defendants).* Case No. 2022 L 008574 in re. Medline EtO Release, Consolidated with 2023 L 00686 in the Circuit Court of Cook County, Illinois.

209. Expert Rebuttal Report (September 2024) for *Eve Isaacks et. al., (Plaintiffs) v. Terumo BCT et. al., (Defendants)* before District Court, Jefferson County, Colorado Case Numbers: 2022CV031124 (consolidated with *Douglass et. al.* 2023CV30085).

210. Prefiled Direct Testimony (October 2024) and Rebuttal Testimony (December 2024) on behalf of the *Sierra Club in the matter of the Application of Duke Energy Kentucky, Inc. for a Certificate of Public Convenience and Necessity* to Convert its Wet FGD etc. Case No. 2024-00152 before the Public Service Commission, Commonwealth of Kentucky.

211. Expert Report (December 2024) on behalf of the plaintiffs in the matter of *Mary Beth Tamm et. al., (Plaintiff), Cibelli (Case No. 2023-L-011216) and Wagner (Case No. 2024-L-009290) v. Sterigenics U.S., LLC, et. al., (Defendants),* Case No. 2023-L-5701 in the Circuit Court of Cook County, Illinois.

212. Expert Report (May 19, 2025) on behalf of Appellants Friends of Grays Harbor, et. al., v ORCAA, the City of Hoquiam, and Pacific Northwest Renewable Energy LLC (PNWRE) before the State of Washington Pollution Control Hearings Board, PCHB No. 24-037.

213. July 14. Affidavit in the matter of Environmental Integrity Project, Petitioner v. Pennsylvania Department of Environmental Protection, Office of Open Records, Respondent, relating to records associated with the multi-point ground flare located at Shell Chemical Appalachia LLC Polymers Monaca plant, in the Commonwealth Court of Pennsylvania, Docket No. 728 CD 2025.

214. July 15. Affidavit in Support of the Decision by the Mississippi Environmental Quality Permit Board to Deny the Issuance of a Title V Operating Permit (and Air Permit to Construct) to Amite BioEnergy, LLC's Wood Pellet Manufacturing Facility in Amite County, MS.

215. Expert Report (July 24, 2025) and Updated Expert Report (August 12) in the matters of: Joseph Simonetti et al., v. Sterigenics U.S., LLC, et al., Case No. 2024 L 012328; Mark Leuck et al., v. Sterigenics U.S., LLC, et al., Case No. 2024 L 012500; Karen Ryan, v. Sterigenics U.S., LLC, et al., Case No. 2024 L 013616; Brenda Williams, v. Sterigenics U.S., LLC, et al., Case No. 2024 L 013949 and Myra Burgonio et al., v. Sterigenics U.S., LLC, et al., Case No. 2024 L 013806 on behalf of the Plaintiffs in Circuit Court of Cook County, IL.

216. Supplemental Expert Report (August 29, 2025), Rebuttal Expert Report (October 1, 2025) and Affidavit (December 8, 2025) in the matter of Jordan, et al. v. Terumo BCT Sterilization Services and Terumo BCT, Inc., Case Number: 2020CV031457, on behalf of the Plaintiffs before the District Court Jefferson County, CO

217. Expert Report (September 25, 2025) in the matters of: Andrew and Bridget Kurt v. Sterigenics U.S., LLC, et al., Civil Action No.. 20-A-3432; Kathryn Measel v. Sterigenics U.S., LLC, et al., Civil Action No. 23-A-275; Rhonda and Neal Crawford v. Sterigenics U.S., LLC, et al., Civil Action No. 23-A-278; Holly and Gary Campbell v. Sterigenics U.S., LLC, et al., Civil Action No. 23-A-281; Claudia and Luke Kennison v. Sterigenics U.S., LLC, et al., Civil Action No. 23-A-2432; Brantley Barrow Sr. v. Sterigenics U.S., LLC, et al., Civil Action No. 23-A-2257; Robert Ford v. Sterigenics U.S., LLC, et al., Civil Action No. 23-A-2106; Karl Goodhew v. Sterigenics U.S., LLC, et al., Civil Action No. 23-A-2402; and Rafael and Elizabeth San Miguel v. Sterigenics U.S., LLC, et al., Civil Action No. 23-A-2709 on behalf of the Plaintiffs before the State Court of Cobb County, State of Georgia.

218. Declaration (October 12, 2025) In re: Appeal of Construction Permit No. 01156-01PC for CTC (xAI) Property LLC, 3231 Paul R. Lowry Road, Memphis, Tennessee 38109, Memphis and Shelby County Air Pollution Control Board, Memphis, TN.

219. Expert Report (December 31, 2025) in the Matter *Hernandez et al. v. United States Steel Corp.*, Case No. 19-GD-005325, on behalf of the Plaintiffs, Court of Common Pleas, Allegheny County, PA

C. Occasions where Dr. Sahu has provided oral testimony <u>in depositions, at trial or in similar proceedings</u> include the following:

220. Deposition on behalf of Rocky Mountain Steel Mills, Inc. located in Pueblo, Colorado – dealing with the manufacture of steel in mini-mills including methods of air pollution control and BACT in steel mini-mills and opacity issues at this steel mini-mill.

221. Trial Testimony (February 2002) on behalf of Rocky Mountain Steel Mills, Inc. in Denver District Court.

222. Trial Testimony (February 2003) on behalf of the United States in the Ohio Edison NSR Cases, *United States, et al. v. Ohio Edison Co., et al.*, C2-99-1181 (Southern District of Ohio).

223. Trial Testimony (June 2003) on behalf of the United States in the Illinois Power NSR Case, *United States v. Illinois Power Co., et al.*, 99-833-MJR (Southern District of Illinois).

224. Deposition (10/20/2005) on behalf of the United States in connection with the Cinergy NSR Case. *United States, et* al*. v. Cinergy Corp., et al.*, IP 99-1693-C-M/S (Southern District of Indiana).

225. Oral Testimony (August 2006) on behalf of the Appalachian Center for the Economy and the Environment re. the Western Greenbrier plant, WV before the West Virginia DEP.

226. Oral Testimony (May 2007) on behalf of various Montana petitioners (Citizens Awareness Network (CAN), Women's Voices for the Earth (WVE) and the Clark Fork Coalition (CFC)) re. the Thompson River Cogeneration plant before the Montana Board of Environmental Review.

227. Oral Testimony (October 2007) on behalf of the Sierra Club re. the Sevier Power Plant before the Utah Air Quality Board.

228. Oral Testimony (August 2008) on behalf of the Sierra Club and Clean Water re. Big Stone Unit II before the South Dakota Board of Minerals and the Environment.

229. Oral Testimony (February 2009) on behalf of the Sierra Club and the Southern Environmental Law Center re. Santee Cooper Pee Dee units before the South Carolina Board of Health and Environmental Control.

230. Oral Testimony (February 2009) on behalf of the Sierra Club and the Environmental Integrity Project re. NRG Limestone Unit 3 before the Texas State Office of Administrative Hearings (SOAH) Administrative Law Judges.

231. Deposition (July 2009) on behalf of MTD Products, Inc., in the matter of *Alice Holmes and Vernon Holmes v. Home Depot USA, Inc., et al*.

232. Deposition (October 2009) on behalf of Environmental Defense and others, in the matter of challenges to the proposed Coleto Creek coal fired power plant project at the Texas State Office of Administrative Hearings (SOAH).

233. Deposition (October 2009) on behalf of Environmental Defense, in the matter of permit challenges to the proposed Las Brisas coal fired power plant project at the Texas State Office of Administrative Hearings (SOAH).

234. Deposition (October 2009) on behalf of the Sierra Club, in the matter of challenges to the proposed Medicine Bow Fuel and Power IGL plant in Cheyenne, Wyoming.

235. Deposition (October 2009) on behalf of Environmental Defense and others, in the matter of challenges to the proposed Tenaska coal fired power plant project at the Texas State Office of Administrative Hearings (SOAH). (April 2010).

236. Oral Testimony (November 2009) on behalf of the Environmental Defense Fund re. the Las Brisas Energy Center before the Texas State Office of Administrative Hearings (SOAH) Administrative Law Judges.

237. Deposition (December 2009) on behalf of Environmental Defense and others, in the matter of challenges to the proposed White Stallion Energy Center coal fired power plant project at the Texas State Office of Administrative Hearings (SOAH).

238. Oral Testimony (February 2010) on behalf of the Environmental Defense Fund re. the White Stallion Energy Center before the Texas State Office of Administrative Hearings (SOAH) Administrative Law Judges.

239. Deposition (June 2010) on behalf of the United States in connection with the Alabama Power Company NSR Case. *United States v. Alabama Power Company*, CV-01-HS-152-S (Northern District of Alabama, Southern Division).

240. Trial Testimony (September 2010) on behalf of Commonwealth of Pennsylvania – Dept. of Environmental Protection, State of Connecticut, State of New York, State of Maryland, and State of New Jersey (Plaintiffs) in connection with the Allegheny Energy NSR Case in US District Court in the Western District of Pennsylvania. *Plaintiffs v. Allegheny Energy Inc., et al.,* 2:05cv0885 (Western District of Pennsylvania).

241. Oral Direct and Rebuttal Testimony (September 2010) on behalf of Fall-Line Alliance for a Clean Environment and others in the matter of the PSD Air Permit for Plant Washington issued by Georgia DNR at the Office of State Administrative Hearing, State of Georgia (OSAH-BNR-AQ-1031707-98-WALKER).

242. Oral Testimony (September 2010) on behalf of the State of New Mexico Environment Department in the matter of Proposed Regulation 20.2.350 NMAC – *Greenhouse Gas Cap and Trade Provisions,* No. EIB 10-04 (R), to the State of New Mexico, Environmental Improvement Board.

243. Oral Testimony (October 2010) on behalf of the Environmental Defense Fund re. the Las Brisas Energy Center before the Texas State Office of Administrative Hearings (SOAH) Administrative Law Judges.

244. Oral Testimony (November 2010) regarding BART for PSCo Hayden, CSU Martin Drake units before the Colorado Air Quality Commission on behalf of the Coalition of Environmental Organizations.

245. Oral Testimony (December 2010) regarding BART for TriState Craig Units, CSU Nixon Unit, and PRPA Rawhide Unit) before the Colorado Air Quality Commission on behalf of the Coalition of Environmental Organizations.

246. Deposition (December 2010) on behalf of the United States in connection with the Louisiana Generating NSR Case. *United States v. Louisiana Generating, LLC*, 09-CV100-RET-CN (Middle District of Louisiana).

247. Deposition (February 2011 and January 2012) on behalf of Wild Earth Guardians in the matter of opacity exceedances and monitor downtime at the Public Service Company of Colorado (Xcel)'s Cherokee power plant. No. 09-cv-1862 (D. Colo.).

248. Oral Testimony (February 2011) to the Georgia Office of State Administrative Hearings (OSAH) in the matter of Minor Source HAPs status for the proposed Longleaf Energy Associates power plant (OSAH-BNR-AQ-1115157-60-HOWELLS) on behalf of the Friends of the Chattahoochee and the Sierra Club).

249. Deposition (August 2011) on behalf of the United States in *United States of America v. Cemex, Inc.*, Civil Action No. 09-cv-00019-MSK-MEH (District of Colorado).

250. Deposition (July 2011) and Oral Testimony at Hearing (February 2012) on behalf of the Plaintiffs MYTAPN in the matter of Microsoft-Yes, Toxic Air Pollution-No (MYTAPN) v. State of Washington, Department of Ecology and Microsoft Corporation Columbia Data Center to the Pollution Control Hearings Board, State of Washington, Matter No. PCHB No. 10-162.

251. Oral Testimony at Hearing (March 2012) on behalf of the United States in connection with the Louisiana Generating NSR Case. *United States v. Louisiana Generating, LLC*, 09-CV100-RET-CN (Middle District of Louisiana).

252. Oral Testimony at Hearing (April 2012) on behalf of the New Hampshire Sierra Club at the State of New Hampshire Public Utilities Commission, Docket No. 10-261 – the 2010 Least Cost Integrated Resource Plan (LCIRP) submitted by the Public Service Company of New Hampshire (re. Merrimack Station Units 1 and 2).

253. Oral Testimony at Hearing (November 2012) on behalf of Clean Wisconsin in the matter of Application of Wisconsin Public Service Corporation for Authority to Construct and Place in Operation a New Multi-Pollutant Control Technology System (ReACT) for Unit 3 of the Weston Generating Station, before the Public Service Commission of Wisconsin, Docket No. 6690-CE-197.

254. Deposition (March 2013) in the matter of various Environmental Petitioners v. North Carolina DENR/DAQ and Carolinas Cement Company, before the Office of Administrative Hearings, State of North Carolina.

255. Deposition (August 2013) on behalf of the Sierra Club in connection with the Luminant Big Brown Case. *Sierra Club v. Energy Future Holdings Corporation and Luminant Generation Company LLC*, Civil Action No. 6:12-cv-00108-WSS (Western District of Texas, Waco Division).

256. Deposition (August 2013) on behalf of the Sierra Club in connection with the Luminant Martin Lake Case. *Sierra Club v. Energy Future Holdings Corporation and Luminant Generation Company LLC*, Civil Action No. 5:10-cv-0156-MHS-CMC (Eastern District of Texas, Texarkana Division).

257. Deposition (February 2014) on behalf of the United States in *United States of America v. Ameren Missouri*, Civil Action No. 4:11-cv-00077-RWS (Eastern District of Missouri, Eastern Division).

258. Trial Testimony (February 2014) in the matter of *Environment Texas Citizen Lobby, Inc and Sierra Club v. ExxonMobil Corporation et al.,* Civil Action No. 4:10-cv-4969 (Southern District of Texas, Houston Division).

259. Trial Testimony (February 2014) on behalf of the Sierra Club in connection with the Luminant Big Brown Case. *Sierra Club v. Energy Future Holdings Corporation and Luminant Generation Company LLC*, Civil Action No. 6:12-cv-00108-WSS (Western District of Texas, Waco Division).

260. Deposition (June 2014) and Trial (August 2014) on behalf of ECM Biofilms in the matter of the *US Federal Trade Commission (FTC) v. ECM Biofilms* (FTC Docket #9358).

261. Deposition (February 2015) on behalf of Plaintiffs in the matter of *Sierra Club and Montana Environmental Information Center (Plaintiffs) v. PPL Montana LLC, Avista Corporation, Puget Sound Energy, Portland General Electric Company, Northwestern Corporation, and Pacificorp (Defendants)*, Civil Action No. CV 13-32-BLG-DLC-JCL (US District Court for the District of Montana, Billings Division).

262. Oral Testimony at Hearing (April 2015) and Testimony via Zoom (April 2024) on behalf of Niagara County, the Town of Lewiston, and the Villages of Lewiston and Youngstown in the matter of CWM Chemical Services, LLC New York State Department of Environmental Conservation (NYSDEC) Permit Application Nos.: 9-2934-00022/00225, 9-2934-00022/00231, 9-2934-00022/00232, and 9-2934-00022/00249 (pending).

263. Deposition (August 2015) on behalf of Plaintiff in the matter of *Conservation Law Foundation (Plaintiff) v. Broadrock Gas Services LLC, Rhode Island LFG GENCO LLC, and Rhode Island Resource Recovery Corporation (Defendants)*, Civil Action No. 1:13-cv-00777-M-PAS (US District Court for the District of Rhode Island).

264. Testimony at Hearing (August 2015) on behalf of the Sierra Club in the matter of *Amendments to 35 Illinois Administrative Code Parts 214, 217, and 225* before the Illinois Pollution Control Board, R15-21.

265. Deposition (May 2015) on behalf of Plaintiffs in the matter of *Northwest Environmental Defense Center et. al., (Plaintiffs) v. Cascade Kelly Holdings LLC, d/b/a Columbia Pacific Bio-Refinery, and Global Partners LP (Defendants)*, Civil Action No. 3:14-cv-01059-SI (US District Court for the District of Oregon, Portland Division).

266. Trial Testimony (October 2015) on behalf of Plaintiffs in the matter of *Northwest Environmental Defense Center et. al., (Plaintiffs) v. Cascade Kelly Holdings LLC, d/b/a Columbia Pacific Bio-Refinery, and Global Partners LP (Defendants)*, Civil Action No. 3:14-cv-01059-SI (US District Court for the District of Oregon, Portland Division).

267. Deposition (April 2016) on behalf of the Plaintiffs in *Natural Resources Defense Council, Respiratory Health Association, and Sierra Club (Plaintiffs) v. Illinois Power Resources LLC and Illinois Power Resources Generation LLC (Defendants)*, Civil Action No. 1:13-cv-01181 (Central District of Illinois, Peoria Division).

268. Trial Testimony at Hearing (July 2016) in the matter of Tesoro Savage LLC Vancouver Energy Distribution Terminal, Case No. 15-001 before the State of Washington Energy Facility Site Evaluation Council.

269. Trial Testimony (December 2016) on behalf of the challengers in the matter of the Delaware Riverkeeper Network, Clean Air Council, et. al., vs. Commonwealth of Pennsylvania Department of Environmental Protection and R. E. Gas Development LLC regarding the Geyer well site before the Pennsylvania Environmental Hearing Board.

270. Trial Testimony (July-August 2016) on behalf of the United States in *United States of America v. Ameren Missouri*, Civil Action No. 4:11-cv-00077-RWS (Eastern District of Missouri, Eastern Division).

271. Trial Testimony (January 2017) on the Environmental Impacts Analysis associated with the Huntley and Huntley Poseidon Well Pad Hearing on behalf citizens in the matter of the special exception use Zoning Hearing Board of Penn Township, Westmoreland County, Pennsylvania.

272. Trial Testimony (January 2017) on the Environmental Impacts Analysis associated with the Apex energy Backus Well Pad Hearing on behalf citizens in the matter of the special exception use Zoning Hearing Board of Penn Township, Westmoreland County, Pennsylvania.

273. Trial Testimony (January 2017) on the Environmental Impacts Analysis associated with the Apex energy Drakulic Well Pad Hearing on behalf citizens in the matter of the special exception use Zoning Hearing Board of Penn Township, Westmoreland County, Pennsylvania.

274. Trial Testimony (January 2017) on the Environmental Impacts Analysis associated with the Apex energy Deutsch Well Pad Hearing on behalf citizens in the matter of the special exception use Zoning Hearing Board of Penn Township, Westmoreland County, Pennsylvania.

275. Deposition Testimony (July 2017) on behalf of Plaintiffs in the matter of *Casey Voight and Julie Voight v Coyote Creek Mining Company LLC (Defendant)* Civil Action No. 1:15-CV-00109 (US District Court for the District of North Dakota, Western Division).

276. Deposition Testimony (November 2017) on behalf of Defendant in the matter of *Oakland Bulk and Oversized Terminal (Plaintiff) v City of Oakland (Defendant,)* Civil Action No. 3:16-cv-07014-VC (US District Court for the Northern District of California, San Francisco Division).

277. Deposition Testimony (December 2017) on behalf of Plaintiff in the matter of *Wildearth Guardians (Plaintiff) v Colorado Springs Utility Board (Defendant)* Civil Action No. 1:15-cv-00357-CMA-CBS (US District Court for the District of Colorado).

278. Deposition Testimony (January 2018) in the matter of National Parks Conservation Association (NPCA) v. State of Washington Department of Ecology and British Petroleum (BP) before the Washington Pollution Control Hearing Board, Case No. 17-055.

279. Trial Testimony (January 2018) on behalf of Defendant in the matter of *Oakland Bulk and Oversized Terminal (Plaintiff) v City of Oakland (Defendant,)* Civil Action No. 3:16-cv-07014-VC (US District Court for the Northern District of California, San Francisco Division).

280. Trial Testimony (April 2018) on behalf of the National Parks Conservation Association (NPCA) in the matter of NPCA v State of Washington, Department of Ecology and BP West Coast Products, LLC, PCHB No. 17-055 (Pollution Control Hearings Board for the State of Washington.

281. Deposition (June 2018) (harm Phase) on behalf of Plaintiffs in the matter of *Natural Resources Defense Council, Inc., Sierra Club, Inc., and Respiratory Health Association v. Illinois Power Resources LLC, and Illinois Power Resources Generating LLC (Defendants)*, Civil Action No. 1:13-cv-01181 (US District Court for the Central District of Illinois, Peoria Division).

282. Trial Testimony (July 2018) on behalf of Petitioners in the matter of *Coosa River Basin Initiative and Sierra Club (Petitioners) v State of Georgia Environmental Protection Division, Georgia Department of Natural Resources (Respondent) and Georgia Power Company (Intervenor/Respondent)*, Docket Nos: 1825406-BNR-WW-57-Howells and 1826761-BNR-WW-57-Howells, Office of State Administrative Hearings, State of Georgia.

283. Deposition (January 2019) and Trial Testimony (January 2019) on behalf of Sierra Club and Texas Campaign for the Environment (Appellants) in the contested case hearing before the Texas State Office of Administrative Hearings in Docket Nos. 582-18-4846, 582-18-4847 (Application of GCGV Asset Holding, LLC for Air Quality Permit Nos. 146425/PSDTX1518 and 146459/PSDTX1520 in San Patricio County, Texas).

284. Deposition (February 2019) and Trial Testimony (March 2019) on behalf of Sierra Club in the State of Florida, Division of Administrative Hearings, Case No. 18-2124EPP, Tampa Electric Company Big Bend Unit 1 Modernization Project Power Plant Siting Application No. PA79-12-A2.

285. Deposition (June 2019) relating to the appeal of air permits issued to PTTGCA on behalf of Appellants in the matter of *Sierra Club (Appellants) v. Craig Butler, Director, et. al., Ohio EPA (Appellees)* before the State of Ohio Environmental Review Appeals Commission (ERAC), Case Nos. ERAC-19-6988 through -6991.

286. Deposition (September 2019) on behalf of Appellants relating to the NPDES permit for the Cheswick power plant in the matter of *Three Rivers Waterkeeper and Sierra Club (Appellants) v. State of Pennsylvania Department of Environmental Protection (Appellee) and NRG Power*

Midwest (Permittee), before the Commonwealth of Pennsylvania Environmental Hearing Board, EHB Docket No. 2018-088-R.

287. Deposition (December 2019) on behalf of the Plaintiffs in the matter of David Kovac, individually and on behalf of wrongful death class of Irene Kovac v. BP Corporation North America Inc., Circuit Court of Jackson County, Missouri (Independence), Case No. 1816-CV12417.

288. Deposition (February 2020, virtual) and testimony at Hearing (August 2020, virtual) on behalf of Earthjustice in the matter of *Objection to the Issuance of PSD/NSR and Title V permits for Riverview Energy Corporation*, Dale, Indiana, before the Indiana Office of Environmental Adjudication, Cause No. 19-A-J-5073.

289. Hearing (July 14-15, 2020, virtual) on behalf of the Sierra Club in the matter of *the Application of the Ohio State University for a certificate of Environmental Compatibility and Public Need to Construct a Combined Heat and Power Facility in Franklin County, Ohio*, before the Ohio Power Siting Board, Case No. 19-1641-EL-BGN.

290. Hearing (September 2020, virtual) on behalf of WildEarth Guardians (petitioners) in the matter of *the Appeals of the Air Quality Permit No. 7482-M1 Issued to 3 Bear Delaware* Operating – *NM LLC (EIB No. 20-21(A) and Registrations Nos. 8729, 8730, and 8733 under General Construction Permit for Oil and Gas Facilities (EIB No. 20-33 (A)*, before the State of New Mexico, Environmental Improvement Board.

291. Deposition (December 2020, March 4-5, 2021, all virtual) and Hearing (April 2021, virtual) in support of Petitioner's Motion for Stay of PSCAA NOC Order of Approval No. 11386 in the matter of the *Puyallup Tribe of Indians v. Puget Sound Clean Air Agency (PSCAA) and Puget Sound Energy (PSE),* before the State of Washington Pollution Control Hearings Board, PCHB No. P19-088.

292. Hearing (September 2020, virtual) on the *Initial Economic Impact Analysis (EIA) for A Proposal To* Regulate *NOx Emissions from Natural Gas Fired Rich-Burn Natural Gas Reciprocating Internal Combustion Engines (RICE) Greater Than 100 Horsepower* prepared on behalf of Earthjustice and the National Parks Conservation Association in the matter of Regulation Number 7, Alternate Rules before the Colorado Air Quality Control Commission.

293. Deposition (December 2020, virtual and Hearing February 2021, virtual) on behalf of the Plaintiffs (Shrimpers and Fishermen of the Rio Grande Valley represented by Texas RioGrande Legal Aid, Inc.) in the matter of the Appeal of Texas Commission on Environmental Quality (TCEQ) Permit Nos. 147681, PSDTX1522, GHGPSDTX172 for the Jupiter Brownsville Heavy Condensate Upgrader Facility, Cameron County, before the Texas State Office of Administrative Hearings, SOAH Docket No. 582-21-0111, TCEQ Docket No. 2020-1080-AIR.

294. Deposition (January 2021, virtual) on behalf of Plaintiffs in the matter of *PennEnvironment Inc., and Clean Air Council (Plaintiffs) and Allegheny County Health Department (Plaintiff-Intervenor) v. United States Steel Corporation (Defendant)*, Civil Action No. 2-19-cv-00484-MJH (US District Court for the Western District of Pennsylvania.)

295. Deposition (February 2021, virtual) on behalf of Plaintiffs in the matter of *Sierra Club Inc. (Plaintiff) v. GenOn Power Midwest LP (*Defendants*)*, Civil Action No. 2-19-cv-01284-WSS (US District Court for the Western District of Pennsylvania.)

296. Deposition (April 2021, virtual) on the Potential Remedies to Avoid Adverse Thermal Impacts from the Merrimack Station on behalf of Plaintiffs in the matter of *Sierra Club Inc. and the* Conservation *Law Foundation (Plaintiffs) v. Granite Shore Power, LLC et. al., (Defendants)*, Civil Action No. 19-cv-216-JL (US District Court for the District of New Hampshire.)

297. Deposition (June 2021, virtual) on behalf of Plaintiffs in the matter of *Sierra Club (Plaintiff) v. Woodville Pellets, LLC (Defendant)*, Civil Action No. 9:20-cv-00178-MJT (US District Court for the Eastern District of Texas, Lufkin Division).

298. Deposition (June 2021, virtual) on behalf of the Plaintiffs in the matter of *Modern Holdings, LLC, et al. (Plaintiffs) v. Corning Inc., et al. (Defendants)*, Civil Action No. 5:13-cv-00405-GFVT, (US District Court for the Eastern District of Kentucky, Central Division at Lexington).

299. Testimony (June 2021, virtual) regarding the Aries Newark LLC Sludge Processing Facility, Application No. CPB 20-74, (Central Planning Board, City of Newark, New Jersey).

300. Testimony at Hearing (October 2021) on behalf of Evraz Rocky Mountain Steel in the matter of Colorado's Proposed Revisions to Regulation 22, the Greenhouse Gas Emissions and Energy Management for the Manufacturing Sector in Colorado (GEMM Rule), before the Colorado Air Quality Control Commission.

301. Deposition (November 2021) for *Charles Johnson Jr. (Plaintiff) v. BP Exploration and Production Inc., et. al. (Defendant),* Civil Action No. 2:20-CV-01329 (Related to 12-968 BELO in MDL No. 2179). (US District Court for the Eastern District of Louisiana).

302. Testimony at Hearing (November 2021) on behalf of *National Parks Conservation Association, et. al*., in the matter of the Proposed Revisions to Colorado's Regional Haze State Implementation Plan (SIP) and Colorado Regulation 23, before the Colorado Air Quality Control Commission.

303. Deposition (December 2021) on behalf of Plaintiffs in Re: Deepwater Horizon BELO Cases, Case No. 3:19cv963-MCR-GRJ (US District Court for the Northern District of Florida, Pensacola Division).

304. Deposition (December 2021) for *James Noel (Plaintiff) v. BP Exploration and Production Inc., et. al. (Defendant),* Civil Action No. 1:19-CV-00694-JB-MU-C (US District Court for the Southern District of Alabama, Southern Division).

305. Testimony at Hearing (February 2022, virtual) in the matter of the *Appeal Petition for Hearing on Air Quality Permit No. 8585 on behalf of Earth Care New Mexico et. al., (Petitioners) v. New Mexico Environment Department and Associated Asphalt and Materials, LLC (Applicant),* No. EIB 21-48 before the State of New Mexico Environmental Improvement Board.

306. Deposition (March 2022) and Rebuttal Deposition (July 2022) for *Kamuda (Plaintiff) v. Sterigenics U.S., LLC, et. al., (Defendant)*, Case No. 2018-L-010475 (Circuit Court of Cook County, Illinois.)

307. Deposition (April 2022, virtual) in the matter of Application of TPC Group LLC for New State and PSD Air Quality Permits (various), TCEQ Docket No. 2021-1422-AIR, SOAH Docket No. 582-22-0799, Before the Texas State Office of Administrative Hearings.

308. Deposition (May 2022, virtual) in the matter of the *Water Works and Sewer Board of the City of Gadsden (Plaintiff) v. 3M Company, et. al., (*Defendants*)*, Civil Action No.: 31 CV-2016-900676.00 (Circuit County of Etowah County, Alabama)

309. Deposition (June 2022 and September 2022, both virtual) for *Teresa* Fornek *(Plaintiff) v. Sterigenics U.S., LLC, et. al., (Defendant)*, Case No. 2018-L-010744 (Circuit Court of Cook County, Illinois.)

310. Deposition (June 2022, virtual) on behalf of the Plaintiffs in the matter of Toll Brothers, Inc., and Porter Ranch Development Company (Plaintiffs) v. Sempra Energy, Southern California Gas Company et. al., (Defendants), Southern California [Aliso Canyon] Gas Leak Cases, JCCP No.: 4861, Lead Case No.: BC674622, Superior Court of the State of California for the County of Los Angeles.

311. Deposition (July 2022) for *Richard Dufour (Plaintiff) v. BP Exploration and Production Inc., et. al. (Defendant)*, Civil Action No. 19-cv-00591 (US District Court for the Southern District of Mississippi).

312. Trial (August 2022) on behalf of the Plaintiffs in the matter of Modern *Holdings, LLC, et al. (Plaintiffs) v. Phillips (Defendants)*, Civil Action No. 5:13-cv-00405-GFVT, (US District Court for the Eastern District of Kentucky, Central Division at Lexington).

313. Trial (August 2022, in person) for *Susan Kamuda (Plaintiff) v. Sterigenics U.S., LLC, et. al., (Defendant)*, Case No. 2018-L-010475 (Circuit Court of Cook County, Illinois).

314. Deposition (September 2022, virtual) for *Heather Schumacher (Plaintiff) v. Sterigenics U.S., LLC, et. al., (Defendant)*, Case No. 2018-L-010744 (Circuit Court of Cook County, Illinois.)

315. Deposition (September 2022) on behalf of Plaintiffs in *Phylliss Grayson et. al. (Plaintiffs), v Lockheed Martin Corporation (Defendant),* Case No. 6:20-cv-01770. (US District Court for the Middle District of Florida – Orlando Division.)

316. Deposition (September 2022) for *Teresa Fornek (Plaintiff) v. Sterigenics U.S., LLC, et. al., (Defendant)*, Case No. 2018-L-010475 (Circuit Court of Cook County, Illinois).

317. Hearing (October 2022) on behalf of the Puyallup Tribe of Indians in the matter of *Washington Utilities and Transportation Commission (Complainant) v. Puget Sound Energy (Respondent)* before the Washington Utilities and Transportation Commission, Docket UE-220066 and UG-220067 (Consolidated).

318. Trial (October 2022, in person) for *Teresa Fornek (Plaintiff) v. Sterigenics U.S., LLC, et. al., (Defendant)*, Case No. 2018-L-010475 (Circuit Court of Cook County, Illinois).

319. Depositions (March 2023, June 2023) for *Ann Jordan et. al., and Blake Darnell (Plaintiffs) v. Terumo BCT et. al., (Defendants)* before District Court, Jefferson County, Colorado Case Numbers: 2020CV031457, 2021CV030474 (consolidated with 2020CV031457) and 2020CV03148.

320. Depositions (March 2023, April 2023, May 2023) for Quinn Buczek (Plaintiff) v. Sterigenics US, LLC, Sotera Health, LLC, Prologis First US Properties, LP, et. al., (Defendants) before State Court of Gwinnett County, State of Georgia, Case No. Civil Action File No. 20-C-05918-S1.

321. Deposition (May 2023) for *Potomac Riverkeeper and Sierra Club (Plaintiffs) v. Virginia Electric and Power Company (Defendant)*, Civil Action No. 2:21-CV-23 (Kleeh) (US District Court for the Northern District of West Virginia, Elkins Division).

322. Deposition (May 2023) for Mark Letart (Plaintiff), et al. v. Union Carbide Corporation, et al. (Defendants), Case No. 2:19-cv-877, U.S. District Court, Southern District of West Virginia, Charleston Division.

323. Testimony at Hearing on behalf of Evraz North America In the Matter of Colorado Air Quality Regulation Proposed Revisions to Regulation Number 3 to establish enhanced Modeling, monitoring and permitting requirements for Stationary sources in disproportionately impacted communities 5 CCR 1001-5, before the Air Quality Control Commission, State of Colorado.

324. Deposition (2023) and Daubert Hearing (August 2024) for *Vervicia Henderson, et al. (Plaintiff) v. Lockheed Martin Corporation (Defendant)*, Case No. 6:21-cv-01363, U.S. District Court, Middle District of Florida, Orlando Division.

325. Testimony at Hearing (July 2023) *Clean Air Council, Citizens for Pennsylvania's Future, Mountain* Watershed *Association (Appellants) v. Allegheny County Health Department (Appellee) and Allegheny Energy Center (*Intervenor*, Permittee),* Case No. 21-043 before the Hearing Officer of the Allegheny County Health Department.

326. Deposition (July 2023) for *Ezequiel Caraballo-Pache (Plaintiff) v. BP Exploration and Production Inc., et. al. (Defendant)*, Civil Action No. 8:20-cv-00263-SCB-JSS (US District Court for the Middle District of Florida, Tampa Division).

327. Deposition (August 2023) for *Floyd Ruffin (Plaintiff), v. BP Exploration and Production Inc., et. al. (Defendant)*, Civil Action No. 2:20-cv-00334-CJB-JCW (US District Court for the Eastern District of Louisiana, New Orleans Division).

328. Deposition (August 2023) on behalf of petitioners in *Doreen Carey et; al., (Petitioners) v. Fulcrum Centerpoint LLC. (Permittee/Respondent) and Indiana Department of Environmental*

Management (Respondent), Permit Number 089-44042-00660, before the Indiana Office of Environmental Adjudication.

329. Deposition (August 2023) on behalf of the Plaintiff in the *Water Works and Sewer Board of the Town of Centre, Alabama v. 3M Company, et. al.*, Civil Action No.: CV-2017-900049. Circuit Court of Cherokee County, State of Georgia.

330. Deposition (August 2023) for *Matthew Williams (Plaintiff), v. BP Exploration and Production Inc., et. al. (Defendant)*, Civil Action No. 1:22-cv-00278-LG-BWR (US District Court for the Southern District of Mississippi).

331. Deposition (September 2023) for *Vincent Culliver (Plaintiff), v. BP Exploration and Production Inc., et. al. (Defendant)*, Civil Action No. 3:21-cv-4942-MCR/HTC (US District Court for the Northern District of Florida).

332. Testimony at Hearing for Greenhouse Gas and Energy Management (GEMM2) for Manufacturing in Colorado (September 2023) on behalf of Environmental Defense Fund.

333. Testimony at Hearing (October 2023) in the matter of *Algonquin Gas Transmission LLC., on behalf of Community Residents (*Petitioners*)*, Commonwealth of Massachusetts Department of Environmental Protection, Office of Appeals and Dispute Resolution, OADR Docket Nos. 2017-011 and 012, Waterways Application License No. W16-4600, Weymouth Mass.

334. Testimony at Hearing (August 2023) on behalf of Citizens for Environmental Justice in the matter of the permit Application of Valero Refining-Texas, LP for Modification to State and Prevention of Significant Deterioration Air Quality Permits No. 38754 and PSDTX324M15 before the Texas State Office of Administrative Hearings, SOAH Docket No. 582-23-14975, TCEQ Docket No. 2023-0203-AIR.

335. Testimony at Hearing (September 2023) on behalf of Appellants in the matter of *PennEnvironment and Sierra Club (Appellants) v. Commonwealth of Pennsylvania, Department of Environmental Protection, (Appellee), and PPG Industries, Inc. (Permittee)*, EHB Docket No. 2022-032-B. Environmental Hearing Board, Department of Environmental Protection, State of Pennsylvania.

336. Testimony at Hearing (November 2023) on behalf of the Puyallup Tribe of Indians in the matter of *Washington Utilities and Transportation Commission (Complainant) v. Puget Sound Energy (Respondent)*, Docket: UG-230393. Before the Washington Utilities and Transportation Commission.

337. Deposition (February 6, 2024, July 2024) in the matter of *Gena M. McLendon (Plaintiff) v. Becton, Dickinson and Company, et. al. (Defendants)*, on behalf of the Plaintiff in Civil Action File No. 20-C-07123-S1 in the State Court of Gwinnett County, State of Georgia.

338. Testimony at Hearing (February 7, 2024) in the matter of *Jefferson County Foundation, et. al., (Appellants) v. Laura M. Crowder, Director, Division of Air Quality, Department of Environmental Protection (Appellee)*, No. 23-02.AQB on behalf of the Appellant, before the West Virginia Air Quality Hearing Board, Charleston, WV. Also, testimony in related matter No. 23-01-AQB (Roxul USA Inc., d/b/a Rockwool v. same Appellee at No. 23-02-AQB).

339. Deposition (February 2024) and Trial testimony (June 2024) on behalf of the Plaintiffs in the matter of *Penn Environment and Sierra Club (Plaintiffs) v. PPG Industries, Inc. (Defendants).* Case No. 2:12-CV-00342 in the US District Court for the Western District of Pennsylvania.

340. Mediation Expert Testimony (February, March, and September 2024) in the matter of Pueblo Y Salud, Inc., and Jorge Rodriguez, et al. v. City of Los Angeles acting by and through The Los Angeles Department of Water & Power, Case No. 21STCV04346 (Lead Case) and Related Cases: 20STCV48159; 21STCV21942,21STCV22541, 21STCV25022, and22STCV27707, Superior Court of the State of California, Los Angeles County

341. Deposition (March 2024 and April 2024) on behalf of the Plaintiff in the matter of Kathleen *Koch (Plaintiff) v. Medline Industries, Inc. et. al. and Vantage Specialty Chemicals, Inc. (Defendants)*. Case No. 2320 L 000686 in the Circuit Court of Cook County, IL.

342. Deposition (May 2024 and September 2024) on behalf of the plaintiff in the matter of *Paula Johnson et. al., (Plaintiff) v. Prairie Farms Dairy, Inc. et. al., (Defendants).* Case No. 2017 L 001562 in the Circuit Court, Third Judicial Circuit Madison County, Illinois.

343. Deposition (Phase I: August 2024) and Deposition (Phase II: May 6, 2025) on behalf of the plaintiffs in the matter of *Tom Mutz et al., (Plaintiffs) v. Sterigenics US, LLC (Defendants).* Civil Action File No. 20-A-3448 in the State Court of Cobb County, State of Georgia. Additional Related Cases: Emma J. Bonner 21-A2420; Mary Ann Harrell 21-A4396.

344. Deposition (October 2024 and November 2024) in the matter of *Gary B. Walker (Plaintiff) v. Becton, Dickinson and Company, et. al. (Defendants)*, on behalf of the Plaintiff in Civil Action File No. 21-C-08201-S1 in the State Court of Gwinnett County, State of Georgia.

345. Trial (November 2024) on behalf of the plaintiffs in the matter of *Emily Glass et. al., (Plaintiff) v. B. Braun* Medical *Inc., et. al., (Defendants).* Case No. 00315 (May Term 2021) and Consolidated Cases in the First Judicial District of Pennsylvania Court of Common Pleas of Philadelphia County.

346. Deposition (August 2024) on behalf of the plaintiff in the matter of *Jennifer Perrotti (Plaintiff) v. Lockheed Martin Corporation (Defendant).* Case No. 6:22-cv-01338 in the U.S. District Court Middle District of Florida – Orlando Division.

347. Deposition (August 2024) and Hearing (September 2024) on behalf of *Sierra Club and Portland Citizens United in the matter of the* permit *Application by Corpus Christie Liquefaction LLC* for Air Quality Permit Nos. 105710 and PSDTX1306M1 before the Texas State Office of Administrative Hearings, SOAH Docket No. 582-24-14373, TCEQ Docket No. 2023-1474-AIR.

348. Deposition (September 2024) and Trial (December 2024) on behalf of the Plaintiff in the matter of *Pamela Knobbe (Plaintiff) v. Isomedix Operations, Inc., and Cosmed Group, Inc. (Defendants).* Case No. 2022 L 008574 in re. Medline EtO Release, Consolidated with 2023 L 00686 in the Circuit Court of Cook County, Illinois.

349. Deposition (December 2024) and Testimony at Trial (February 6-7 and 10-11, 2025) for *Eve Isaacks et. al., (Plaintiffs) v. Terumo BCT Sterilization Services, Inc. et. al., (Defendants)* before District Court, Jefferson County, Colorado Case Numbers: 2022CV031124 (consolidated with *Douglass et. al.* 2023CV30085).

350. Deposition (January 14, 2025) in the maters of: Cibelli v. Sterigenics U.S., LLC, et al. Case No. 2023 L 011216 (Consolidated Case No. 2023-L-5701); and Wagner v. Sterigenics U.S., LLC, et al. Case No. 2024 L 009290 (Consolidated Case No. 2023-L-5701), on behalf of the Plaintiffs before the Circuit Court of Cook County, IL

351. January 31 (Prefiled Testimony and Deposition (January 31, 2025) and Testimony at Hearing (March 6, 2025) Cheniere Stage 3/Trains 8 and 9 Texas SOAH Challenge. SOAH Docket No. 582-25-02533, TCEQ Docket No. 2024-1197-AIR, Application by Corpus Christie Liquefaction, LLC for Amendment of Air Quality Permit Nos. 139479 AND PSDTX1496M1

352. Deposition (February 27, 2025) and Testimony at Trial (June 23, 2025) on behalf of Appellants Friends of Grays Harbor, et. al., v ORCAA, the City of Hoquiam, and Pacific Northwest Renewable Energy LLC (PNWRE) before the State of Washington Pollution Control Hearings Board, PCHB No. 24-037.

353. Testimony at Trial (April 17, 2025) and Rebuttal Testimony via Zoom at Trial (April 28, 2025) in the matter of Gary B. Walker (Plaintiff) v. Becton, Dickinson, and Company, et. al., (Defendants) on behalf of the Plaintiff in Civil Action File No. 21-C-08201-S1 in the State Court of Gwinnett County, State of Georgia.

354. July 16. Deposition (July 16, 2025) and Affidavit (September 19, 2025) in the matter of Dr. Lisa D. Miller and Michael E. Dauphin (Plaintiffs) v. Becton, Dickinson and Company, et. al., Defendants, Civil Action No. 20-C-07124-S1 on behalf of the Plaintiffs in the State Court of Gwinnett County, State of Georgia.

355. Daubert Hearing (August 18, 2025) in the matter of *Tom Mutz et al., (Plaintiffs) v. Sterigenics US, LLC (*Defendants*).* Civil Action File No. 20-A-3448 in the State Court of Cobb County, State of Georgia. Additional Related Cases: Emma J. Bonner 21-A2420; Mary Ann Harrell 21-A4396.

356. Testimony and Rebuttal Testimony (August 21-22, 2025) in the matter of Proposed Regulation No. 31: Control of Methane Emissions from Municipal Solid Waste Landfills (Proposed 5 CCR 1001-33) before the Air Quality Control Commission, State of Colorado.

357. Class Certification Hearing (September 2, 2025) on behalf of the Plaintiff in the matter of *Mourad Abdelaziz et. al., (Plaintiff) v. B. Braun Medical Inc., (Defendant).* Case No. 2020-C-1984 in the Pennsylvania Court of Common Pleas, Lehigh County.

358. Deposition (September 9-10, 2025) in the matters of: Joseph Simonetti et al., v. Sterigenics U.S., LLC, et al., Case No. 2024 L 012328; Mark Leuck et al., v. Sterigenics U.S., LLC, et al., Case No. 2024 L 012500; Karen Ryan, v. Sterigenics U.S., LLC, et al., Case No. 2024 L 013616; Brenda Williams, v. Sterigenics U.S., LLC, et al., Case No. 2024 L 013949 and Myra Burgonio et al., v. Sterigenics U.S., LLC, et al., Case No. 2024 L 013806 on behalf of the Plaintiffs in Circuit Court of Cook County, IL.

359. Deposition (September 30, 2025) in the matters of: Andrew and Bridget Kurt v. Sterigenics U.S., LLC, et al., Civil Action No.. 20-A-3432; Kathryn Measel v. Sterigenics U.S., LLC, et al., Civil Action No. 23-A-275; Rhonda and Neal Crawford v. Sterigenics U.S., LLC, et al., Civil Action No. 23-A-278; Holly and Gary Campbell v. Sterigenics U.S., LLC, et al., Civil Action No. 23-A-281; Claudia and Luke Kennison v. Sterigenics U.S., LLC, et al., Civil Action No. 23-A-2432; Brantley Barrow Sr. v. Sterigenics U.S., LLC, et al., Civil Action No. 23-A-2257; Robert Ford v. Sterigenics U.S., LLC, et al., Civil Action No. 23-A-2106; Karl Goodhew v. Sterigenics U.S., LLC, et al., Civil Action No. 23-A-2402; and Rafael and Elizabeth San Miguel v. Sterigenics U.S., LLC, et al., Civil Action No. 23-A-2709 on behalf of the Plaintiffs before the State Court of Cobb County, State of Georgia.

360. Hearing (October 14, 2025), Rebuttal Testimony Affidavit (August 20, 2025), Affidavit Testimony (July 15, 2025) in Support of the Decision by the Mississippi Environmental Quality Permit Board to Deny the Issuance of a Title V Operating Permit 0080-00031 (and Air Permit to Construct) to Amite BioEnergy LLC, Gloster, Amite County, MS, before the Mississippi Environmental Quality Permit Board

361. Testimony at Hearing (December 3, 2025) In the matter of Tucker United, West Virginia Highlands Conservancy, and Sierra Club (Appellants) v. Director, Division of Air Quality, Department of Environmental Protection (Appellee) and Fundamental Data LLC (Intervenor), Appeal No. 25-AQB-02 on behalf of the Appellants, West Virginia Air Quality Hearing Board, Charleston, WV.

362. Deposition (October 24, 2025) in the matter of Jordan, et al. v. Terumo BCT Sterilization Services and Terumo BCT, Inc., Case Number: 2020CV031457, on behalf of the Plaintiffs before the District Court Jefferson County, CO

363.

2026 Matters

- Affidavit (January 8, 2026)) in the matter re. International Terminals Company, LLC (ITC) Air Quality Permit Number 95754 on behalf of the Harris County Attorney's Office.
- Affidavit Terumo Jordan (January)
- Trial Testimony Terumo Jordan (Jan 30 and Feb 2)
- Deposition, ICAP Blue Ammonia (Feb 5)
- Rebuttal Testimony Terumo Jordan (Remote, Feb 18)
- Trial Testimony Johnson Dry Ice (Feb 19 and 20)
- Affidavit Fermi Data Center (Feb 17)
- Expert Report TX AG ITC Fire (Feb 20)
- Hearing SOAH ICAP Blue Ammonia EIP (March 11)
- Prefiled Testimony SoCalGas Woody Biomass to Methane Pilot Project (904G), CPUC Docket A.25-10-008 (March 13)
- Declaration in Support of Plaintiffs Yuri Munoz and Maritza Fuentes' Opposition to Defendant Sterigenics US LLCs's Motion for Summary Judgement, Lead Case No. 24STCV06677, Superior Court of the State of California in and for the County of Los Angeles (March 26)
- Expert Report and Affidavit, The State of New Mexico, ex rel. Raul Torrez, Attorney General, Plaintiffs v. Sterigenics US LLC, Sotera Health Holdings, LLC, Sotera Health LLC and Sotera Health Company, Defendants, State of New Mexico, Third Judicial District Court County of Dona Ana, No. D-307-CV-2020-02629 (March 30)
- Deposition Bard/Becton Cooper Matter (March 31)
- Affidavit, El Paso/Western (April 15)
- Deposition Sterigenics New Mexico (April 16)
- Rebuttal Report US Steel (April 17)
- Lockheed Trial, Orlando (May 4)
- ITC Fire/TX AG (June 8)
- US Steel Suppl. Report (June 11)
- EJ/Woody Biomass Surrebuttal Testimony (June 12)
- US Steel Deposition (June 17, 18)
- LA City/Hyperion Deposition (July 13, 14)
- Appellant's Direct Testimony in Hearing on Prevention of Significant Deterioration for Permit to Construct No. 0680-00119 for MZX Tech, LLC (xAI/Space X) Datacenter, Mississippi DEQ (July 14, Affidavit August 11)
- PPG/BASF Report (July 31)
- Sterigenics Vernon Report (August 4)
- Deposition TX AG ITC Fire (August 4)
- Creola Report (August 6)
- Shell Monaca Report/Affidavit (August 7)
- OK AG Affidvit for Inola Aluminum (August 11)
- MZX Datacenter Affidavit (August 11) – See above

- PPG Deposition (October 1)
- Sweetheart/Solo Deposition (October 13)
- Sterigenics Vernon Deposition (November 4, 5)
- MZX/xAI Hearing Jackson MS (November 10)

Attachment B

The Army Rejected a Cleaner Option to Destroy Lead-Laced Explosives in Iowa

The Army had hired a firm to turn the explosives into harmless waste, but then dropped it in favor of a controlled blast that could launch lead dust across Iowa.

Nov. 21, 2026





The Iowa Army Ammunition Plant in Middletown, Iowa, where the blast is planned for Monday.Quinn Glabicki/The New York Times

In March, when the Army discovered nearly five tons of rapidly deteriorating explosives at an Iowa base, it faced two main choices: hire a company to safely dissolve the chemicals, or blow them up.

The Army awarded a contract to MuniRem Environmental, a Georgia-based firm that uses chemicals to neutralize munitions. But it canceled the deal two months later, citing safety concerns, opting to blow up nearly five tons of the material instead.

The detonation is scheduled for Monday. Residents, environmentalists and elected leaders are in an uproar because the material contains lead, and the blast could potentially contaminate hundreds of square miles with toxic dust.

The Army did not respond to questions about its canceled deal with

MuniRem and why it chose to blow up the dangerous material. The details about the MuniRem contract have not previously been reported.

It is unclear why the Army did not remove and dispose of the drums of lead azide before they reached the point of deterioration that forced the decision to detonate them.

There is no safe level of exposure to lead, which is a neurotoxin. It is particularly dangerous to children and pregnant women. It can interfere with fetal brain development, cause cognitive and behavioral harm and increase the risk of premature births or miscarriage.

Earlier this week, the Army stated in documents clearing the way for Monday's planned detonation that chemical alternatives "offered environmental protections by avoiding a blast plume." The documents didn't name the alternative method, but said it could process as much as 10 drums per day, requiring up to 22 days to get through the stockpile in Iowa.

The documents also said that the alternative had been "eliminated from detailed study" because it required personnel to handle the explosives and would drastically increase the probability of an accidental detonation, creating an "unacceptable risk to human safety."

In a letter Friday to the Iowa governor, Kim Reynolds, the Environmental Protection Agency said that those concerns had been raised by the Army, Federal Bureau of Investigation, and Bureau of Alcohol, Tobacco, Firearms and Explosives.

The agencies said that any movement of the barrels, or even removing the lids, could cause a spontaneous detonation, posing "a significant risk to personnel and the surrounding population," E.P.A. regional administrator Jim

Macy wrote. None of the agencies immediately responded to requests for comment.

That came after the acting secretary of the Army, Adam Telle, said in a statement on Thursday that there was urgency to destroy the lead azide because temperatures were expected to drop below freezing, which could "risk further destabilization" of the material.

An environmental group is challenging the detonation permit granted to the Army by the Environmental Protection Agency. The Justice Department argued on Friday that the Army has the authority to blow up the cache, regardless of an E.P.A. permit. A federal court has yet to rule on the complaint.

While detonation of unneeded or unstable ordnance in the open air has for decades been a standard disposal method, in more recent years businesses have developed chemical processes that can break apart explosives at the molecular level. The resulting byproducts are typically nonhazardous and can be buried in landfills.

But such chemical sprays are relatively new and unfamiliar to many in the military who have spent their careers blowing up unneeded or unstable munitions on demolition ranges.

MuniRem presented its chemical technology in March to an expert panel assembled by the Army to find a solution to the lead azide crisis at the Iowa ammunition facility.

Lead azide is sensitive to heat, shock and friction, meaning it can easily detonate if mishandled. And when it degrades, these risks increase.

MuniRem's technology uses a sulfur-based solution that breaks down

explosives and immobilizes toxic chemicals, rather than detonating or burning them.

According to materials presented to the expert panel by MuniRem, and reviewed by The New York Times, the company presented case studies in which its solution was applied to unstable lead azide, including the disposal of 412 pounds of aged lead azide that had been poorly stored inside an ammunition bunker.

In an interview, Valentine Nzengung, MuniRem's chief executive and a professor in environmental geochemistry at the University of Georgia, said that MuniRem had proposed spraying the bunker interiors and barrel surfaces to neutralize risks of spontaneous explosions. That would make it possible to determine how to safely open the barrels and neutralize the lead azide inside, he said.

"Our position on this is very straightforward," he said. "We believe that any disposal decision should protect public health."

Following the presentation, MuniRem was hired in late March to dispose of the volatile explosive. But two months later, the Army terminated the contract.

Dr. Nzengung said the Army gave no reason for the cancellation aside from the fact that then-Secretary of the Army, Dan Driscoll, had made the final determination to order the controlled detonation instead. That involves placing explosive charges around the material in both bunkers and blowing them up simultaneously, destroying the lead azide in the process.

According to emails reviewed by The Times, an Army contracting officer told the company that the decision not to use MuniRem's chemical neutralization

method "was not based on deficiencies" in MuniRem's proposed technical approach.

Mr. Nzengung of MuniRem said the company has filed public records requests seeking more information on why its technology was dismissed, and has not received a response.

Mr. Driscoll resigned as Army secretary on Aug. 31, after clashing with Defense Secretary Pete Hegseth over Mr. Hegseth's removal of qualified Army officers from promotion lists without explanation.

In a statement provided to The Times, a spokesman for Mr. Driscoll said when he was in office and became aware of the lead azide problem at the Iowa plant, he commissioned a study with several federal agencies that oversee explosive safety matters and agreed with their findings that controlled detonation offered the safest possible solution, though Mr. Driscoll believed that more work needed to be done to notify state and local authorities ahead of time to coordinate a public response.

Alternatives to open-air detonation have been gaining acceptance. In 2019, the National Academies of Sciences reviewed MuniRem's process, along with thermal and chemical alternatives to open burning or detonation, and found that it "can be conducted indoors with little danger to the user or community."

The Academies also listed shortcomings of the chemical process, namely that it could be slow. Still, the method "has been demonstrated and validated on several field scale projects," it noted. Workers could wear personal protective gear "to ensure no contact with the reactive chemicals when spraying the MuniRem solution," it said.

A January 2025 E.P.A. guide to detonation alternatives also lists chemical neutralization, including MuniRem, as a valid treatment technology for lead azide.

Andrew J. Whelton, a professor of environmental chemistry and engineering at Purdue University, said any risk of fatality was a valid concern and should drive decision-making. Still, "if there was a non-detonation option that could have been chosen and the deliberate detonation could be avoided, then this is a major decision," he said. "Open burning, open detonation is a practice that is used as a last resort."

The Iowa base plays a critical role in the nation's defense as the main facility for loading explosives into artillery and mortar shells used by the Pentagon. According to an internal Army history report, the site was built from 1940 to 1941 as part of the massive mobilization for arms during World War II and sits on 19,000 acres.

Deakin Donley, a retired Navy explosive ordnance disposal technician said the rapidly-approaching temperature shift meant there would likely not be a reasonable way to stabilize such a large stockpile. "Proceeding with detonation is the only viable option now, unfortunately," he said.

This incident would be "a lesson learned for industry and stockpile management," he added. "Ensuring routine inspections and maintenance would have likely prevented this, and it will be an example cited for decades to come."



Jesse Pesta

Editor for climate news

I'm the editor on this article. The reporters, Hiroko and John, learned that a tech company, MuniRem, had signed a deal with the Army to clean up these dangerous explosives in Iowa -- but then the Army dropped that plan, and instead decided to blow them up. This is a complicated situation: The Army says that delaying its planned explosion could put people further at risk. But the blast could release a toxic cloud of lead dust stretching for miles.We're particularly interested in hearing from readers in the potentially affected area. Tell us how you're preparing for a potential detonation, how the situation is affecting you, and what you think is the right way to handle this crisis.

Hiroko Tabuchi covers pollution and the environment for The Times. She has been a journalist for more than 20 years in Tokyo and New York.

John Ismay is a reporter covering the Pentagon for The Times. He served as an explosive ordnance disposal officer in the U.S. Navy.

IN THE UNITED STATES COURT OF APPEALS
FOR THE EIGHTH CIRCUIT

IOWA ENVIRONMENTAL COUNCIL and SIERRA CLUB, *Petitioners,* v. UNITED STATES ENVIRONMENTAL PROTECTION AGENCY; LEE ZELDIN, in his official capacity as Administrator, U.S. Environmental Protection Agency; and JIM MACY in his official capacity as Regional Administrator, Region 7, U.S. Environmental Protection Agency, *Respondents.*	Case No.: 26-3374 DECLARATION OF GEOFF FRUIN, CITY MANAGER OF THE CITY OF IOWA CITY, IOWA

I, Geoff Fruin, being first duly sworn on oath, states as follows:

I am the City Manager of the City of Iowa City, Iowa. Iowa City's population is 76,229 and is home to the University of Iowa with approximately 31,382 students. Iowa City is located in Johnson County, Iowa and is approximately 62 miles north and slightly west of Middletown, Iowa where the U.S. Army plans to detonate lead azide at the Army munitions plant. The spread of lead in the air following the planned detonation will largely be a function of mitigation efforts of the U.S. Army as well as the wind speed and direction in the immediate aftermath of the detonation. We do not yet know what the wind

conditions will be at the time of the detonation. We have learned some information about the Army's efforts to contain the spread of residual lead, but do not know what, if any, other measures have been considered. It may well be that all options were carefully considered and that there is no better solution than the planned detonation, but that information has not been shared with the City of Iowa City.

Iowa City operates a publicly owned water utility, which produces approximately 6 million gallons of drinking water daily or about 2 billion gallons each year. The water is distributed to Iowa City, University Heights (a neighboring community) and the surrounding area. Most of the raw source water for the Iowa City water treatment plant comes from the Iowa River, which flows through Iowa City. Iowa City is concerned about the potential lead contamination of water sources, including the Iowa River. Iowa City is concerned enough about lead in its water system that it has implemented an ordinance prohibiting repair and instead requiring replacement of any water service line that contains lead. Iowa City Code 16-3C-3(F). Iowa City provides financial support to residents wishing to proactively replace their lead service lines.

According to the Public and Media Advisory issued by the U.S. Army on November 17th, "All humans, but especially children, pregnant individuals, older adults, and other sensitive populations should avoid outdoor activities within the affected areas." "Children under six are especially vulnerable to Lead exposure."

In the 2025/2026 school year, the Iowa City Community school district had 612 students in pre-kindergarten, 993 in kindergarten, and 996 in 1st grade.[1] After adding in residents too young to attend pre-kindergarten, there are easily several thousand children aged six or under in the Iowa City Community School District. According to United States Census data, there were approximately 12,850 residents aged 65 or older in the Iowa City Metro Area in 2025.[2]

I first learned of the scheduled November 20, 2026 detonation through news sources on Tuesday, November 17, 2026. The Emergency Management Agency of Johnson County, Iowa began providing information to Iowa City about the detonation on November 18, 2026. I am unaware of any formal notification to the City of Iowa City from any State or Federal agency other than an email on November 20, 2026 notifying the City that an EPA team is being deployed to collect a pre-detonation surface water sample in Iowa City because it is within a 100-mile radius of the detonation zone.

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[1] RSP & Associates Planning for the Future report, last accessed November 21. https://cbs2iowa.com/resources/pdf/c6a1799f-3ddf-4393-9719-9fb819f0868f-BoundaryMeetingPresentation.pdf?acrobatPromotionSource=embeddedpdfs_chrome-native_view

[2] https://data.census.gov/table/ACSDT1Y2025.B01001?q=Table+B01001&g=040XX00US19_310XX00US26980.

Iowa City has provided information to the public on social media by reposting information from the Public Health Department of Johnson County, Iowa and the Emergency Management Agency of Johnson County, Iowa.

Iowa City has received concerns from the public about the lead azide detonation, including concerns about air quality (especially for children, pets, and individuals that are required to work outside), residual lead on playgrounds, and if there will be short and longer-term health impacts. Iowa City has been discussing possible protocols to address impacts from the detonation; however, it is difficult due to the lack of notice and information that has been provided.

The City of Iowa City supports the Iowa Environmental Council and Iowa Sierra Club in taking legal action to ensure that the lead azide is disposed of safely, with adequate and accurate information provided to allow the public to prepare, with adequate follow-up and support for any post-detonation impacts, and with a minimum of harm to the environment and population.

I certify under penalty of perjury and pursuant to the laws of the State of Iowa that the foregoing is true and correct to the best of my knowledge and belief. Dated this 21st day of November, 2026.

Geoff Fruin, City Manager
City of Iowa City, Iowa