

Indoor Fire Contamination Results – Pre- and Post-Remediation

Presentation to the Smoke Claims &
Remediation Task Force



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October 13, 2025

Smoke Claims & Remediation Task Force



While many homes did not burn, they were inundated with toxic ash carried in the smoke by the wind, impacting residents miles away from the fire itself.

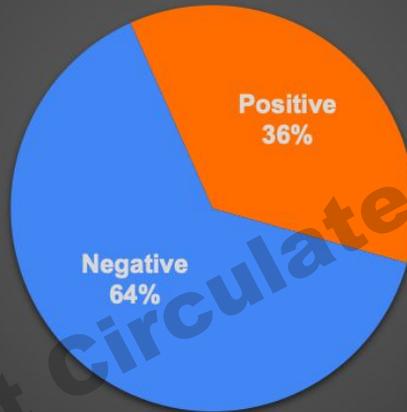


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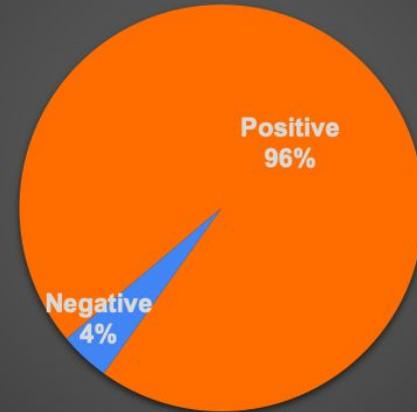
Post Remediation - Contamination Results

Many homes still test **POSITIVE** for contaminants after professional remediation has been completed – posing serious health risks for residents

PERCENTAGE OF HOMES WITH ASBESTOS POST REMEDIATION



PERCENTAGE OF HOMES WITH LEAD POST REMEDIATION



About Eaton Fire Residents United

Eaton Fire Residents United is a coalition of concerned residents, formed in the wake of the devastating Eaton Fire of 2025.

Our mission is to ensure a safe, just, and transparent public health recovery process for the Eaton Fire-affected community. Through community organizing, public engagement, and education, we champion a resilient and empowered Altadena, Pasadena, and Sierra Madre. We promote thorough testing, clear remediation guidelines, insurance accountability, and universal distribution of resources for impacted businesses and residents, including children, homeowners, renters, insured, and uninsured.

Smoke Claims & Remediation Task Force

Nicole Marie-Gerardi Maccalla, PhD

Eaton Fire Connection

- Resident of Altadena (Displaced 137 days)
- Home damaged in the fire (structural & smoke)
- EFRU Director of Data Science & Educational Outreach

Professional Background

- Director of Evaluation & Improvement for the Southern California Clinical and Translational Science Institute (SC CTSI)
- Faculty @ USC, Rossier School of Education
- Data scientist with 25 years of experience in research, regularly managing multi-million dollar federal studies in education and public health initiatives

Educational Background

- PhD and MA in Education, from UCLA, studying Social Research Methodology and Program Evaluation
- BA in Economics and Liberal & Civic Studies from Saint Mary's College of California
- Research Certifications (Social-Behavioral Human Subjects, Research HIPPA, Research Best Practices for Clinical Research)



EFRU & FIRE RECOVERY

- [EFRU published the largest database](#) of indoor contamination in a POST-FIRE ENVIRONMENT
- 70K views of the [EFRU Pre-Remediation Contamination Map](#)
- 15 EFRU speaker events with over 1.5K attendees and 2K views
- [50+ news stories, both national and international referencing EFRU data](#)
- 2300+ residents receive [EFRUs weekly newsletter](#)
- EFRU members run the Health & Safety channel of the 5500+ member EFSN Discord
- 8 academic institution collaborations - Caltech, Purdue, Harvard, UCLA, UC Davis, UC Irvine, UTA, USC
- Member of LA Fire Health Consortium, Environmental Health Impacts WG LADPH, & Soils Working Team of LA County Environmental Health
- Leadership Team of the Fire-Resilient Bioremediation and Landscape Recovery Consortium
- Partnered with 40+ community organizations
- EFRU members lead the Health & Safety Committee & the Smoke Remediation Committee @Eaton Fire Collaborative (EFC) Long Term Recovery Group (LTRG)

Smoke Claims & Remediation Task Force

AGENDA

- **Orientation to EFRU's Eaton Fire Contamination Maps – Pre- and Post-Remediation**
- **What Do We Know About Post WUI-Fire INDOOR Contamination?**
 - **How bad is it?**
 - **Is it improving?**
 - **What are the implications and recommendations?**

Eaton Fire - A Wildland-Urban Interface (WUI) Fire

- WUIs pose significant dangers to human health
 - They release more toxic emissions into the air than fires burning natural vegetation
 - They are closer to populated areas
- The Eaton Fire burned 14,021 acres, or a 22 square mile area (2nd largest in CA)
 - 19 people died
 - 9,418 structures were destroyed
 - 1,073+ structures were damaged
 - 90% of Altadena homes were built prior to 1978



An aerial photograph of a residential neighborhood, likely in a city, showing a grid of streets and numerous houses. The houses appear to be in various states of disrepair or destruction, with many roofs missing or severely damaged, suggesting a natural disaster like a wildfire or earthquake. The trees are mostly bare, and the overall color palette is dominated by greys, browns, and muted greens. Overlaid on the center of the image is the text "WHERE DID IT GO?" in a large, bold, white, sans-serif font. The text is slightly shadowed to stand out against the complex background.

“WHERE DID IT GO?”

An aerial photograph of a city valley, likely Los Angeles, showing a large plume of white smoke rising from the city and spreading across the valley. The surrounding terrain is hilly and brown. The text "After the smoke clears..." is overlaid in white at the top left. Two red text boxes with white outlines, both reading "IS IT SAFE?", are positioned on the left and right sides of the smoke plume. A faint watermark "Do not cut" is visible diagonally across the image.

After the smoke clears...

**“IS IT
SAFE?”**

**“IS IT
SAFE?”**

EFRU's Role: Eaton Fire Contamination Maps



- Residents are facing various health and safety issues in the aftermath of the Eaton Fire, including inside standing homes – EFRU is the voice of the community
- The EFRU **Pre-Remediation Contamination Map** and soon to be released Post-Remediation Contamination Map display reported **contamination levels** of heavy metals and pollutants in the interiors of structures, still standing after the Eaton Fire
- The maps include **peak levels & locations** for:
 - Wildfire Debris (ash, soot, char), Asbestos, Lead, and other CAM-17 heavy metals of concern
 - Testing locations include the Attic, Interior Floors, Interior Window Sills, Interior Hard Surfaces, Garage Floor, Garage Hard Surfaces, and HVAC
 - NO air, fabric, soil, or outdoor test results are currently included on the map

Methods: Eaton Fire Contamination Maps

Professional Environmental Contamination Testing Reports & Remediation

- **100%** from Licensed Professional Testing Companies (Certified Industrial Hygienists or Industrial Hygienist)
- **100%** tested in Certified Laboratories with Chain of Custody (CoC)
- **100%** of homes in Eaton Fire-affected communities (Altadena, Pasadena, Sierra Madre, and surrounding communities)
- Roughly **50%** of homes are inside the burn zone and the other half are at least 250 yards from the nearest burned structure and/or reside in the ash zone.
- Damage to the lot, yard, or home was reported in about **40%** of cases.
- **78%** of homes were professionally remediated, while 22% of homes were DIY following wildfire cleanup recommendations and/or what seemed reasonable.



Why is it Important to Examine Contaminants in Homes?

Understanding what contaminants are in standing structures guides mitigation and remediation efforts (what we can do to make homes habitable & reduce health risks).

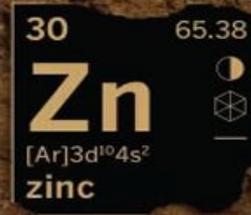
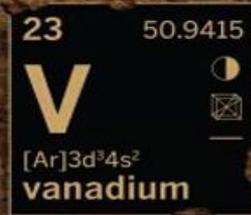
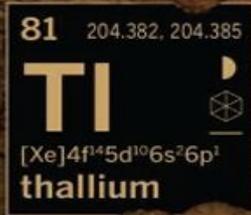
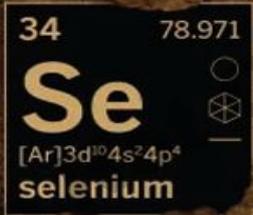
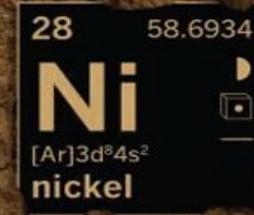
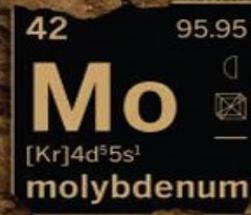
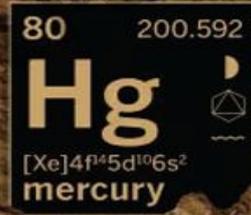
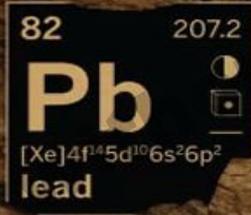
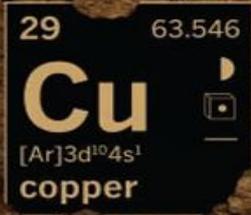
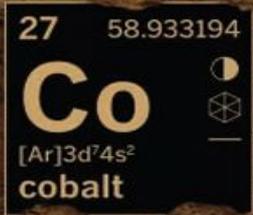
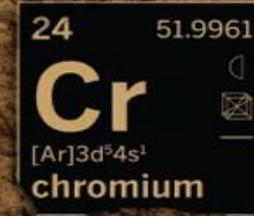
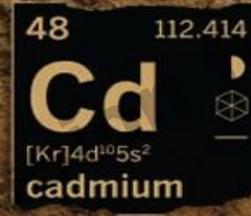
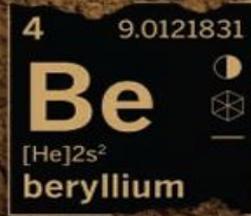
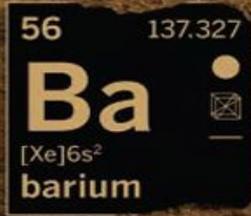
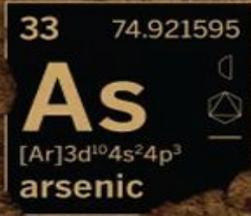
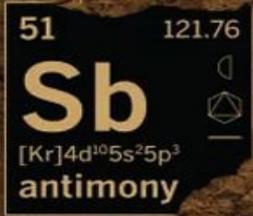
- **Toxin Type:** Many contaminants can be released from WUIs and travel far distances. Some toxins pose greater health risks than others.
- **Duration:** We spend a lot of times in our homes and are at a greater risk of chronic exposure.
- **Multiple routes of possible exposure:** Inhalation + Ingestion + Eye & Skin Contact: We breathe, eat, and drink a lot in our homes.
- **Dose/Strength:** If there is repeated exposure over time, toxins can accumulate in the body.
- **Individual Sensitivity:** Many of us have vulnerable populations living in our homes (e.g., babies, toddlers, young children, elderly, immunocompromised, health complications).

Toxic exposure leads to sickness and death. Information about contaminants in our community can also guide research, policy, and practice **informing** family medicine, public health departments, insurance companies, and elected officials for **action**.

Declaration of an ASH ZONE is needed NOW

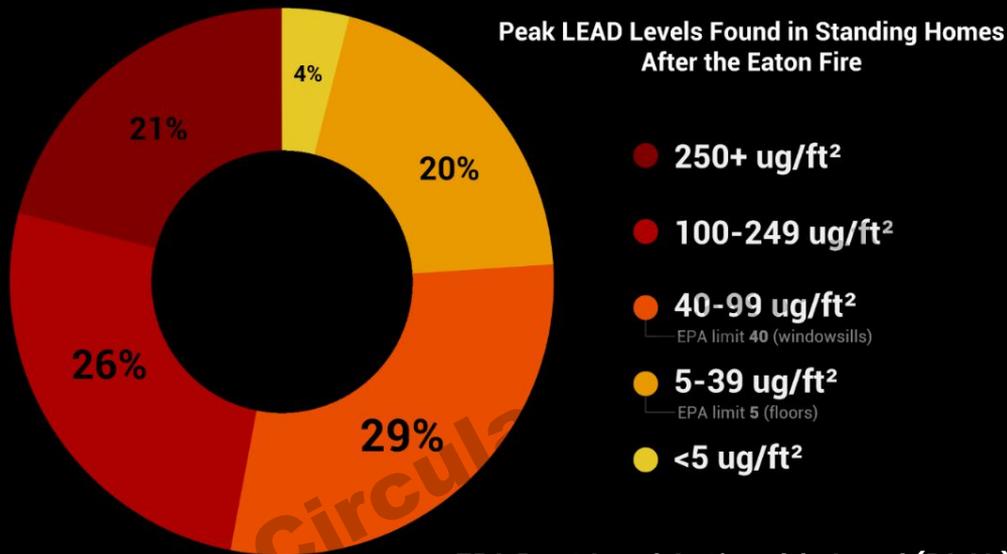
Smoke Claims & Remediation Task Force

The L.A. Wildfires left lead and other toxic material in the soil of the burn zones. Here are the health risks.



**Heavy
Metals
(CAM-17)**

Pre-Remediation Contamination Map



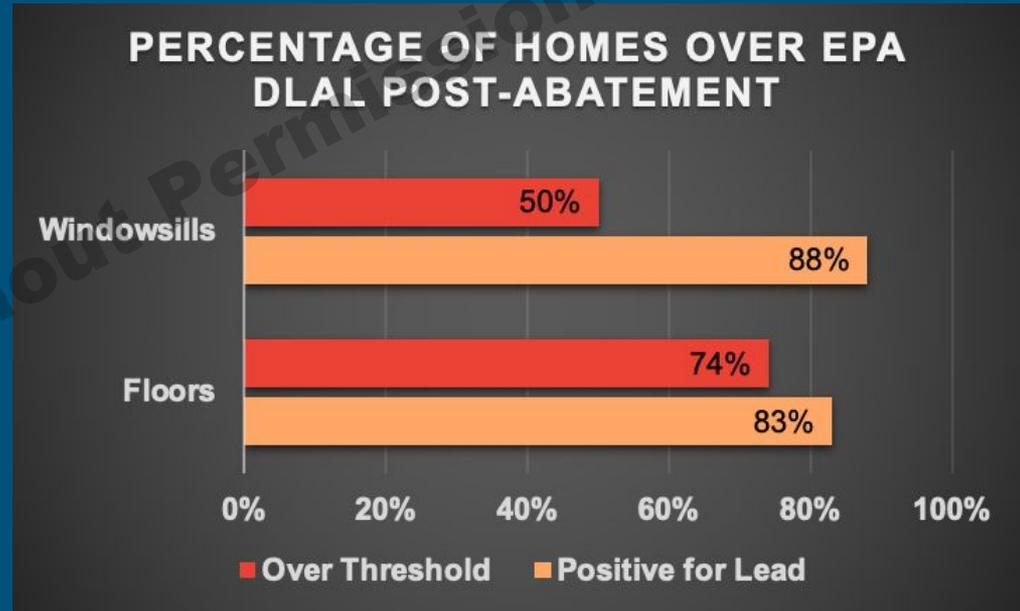
EPA Dust Lead Actionable Level (DLAL): 40ug/ft² for windowsills & 5ug/ft² for floors

Of the 213 standing homes that were tested for LEAD, 100% tested positive. Professional remediation was recommended in all cases.

A home with high levels of lead is NOT SAFE to INHABIT.

Post-Remediation Contamination Map

- 96% of homes still test **POSITIVE** for lead
- Mean lead levels in homes post-remediation
 - Overall: 341.37 ug/ft² (SD 784.74)
 - Windowsills: 159.1 ug/ft² (SD 354.12)
 - **4 times over EPA DLAL**
 - Floors: 295.98 ug/ft² (SD 967.93)
 - **59 times over EPA DLAL**
- Most homes did NOT reach clearance.

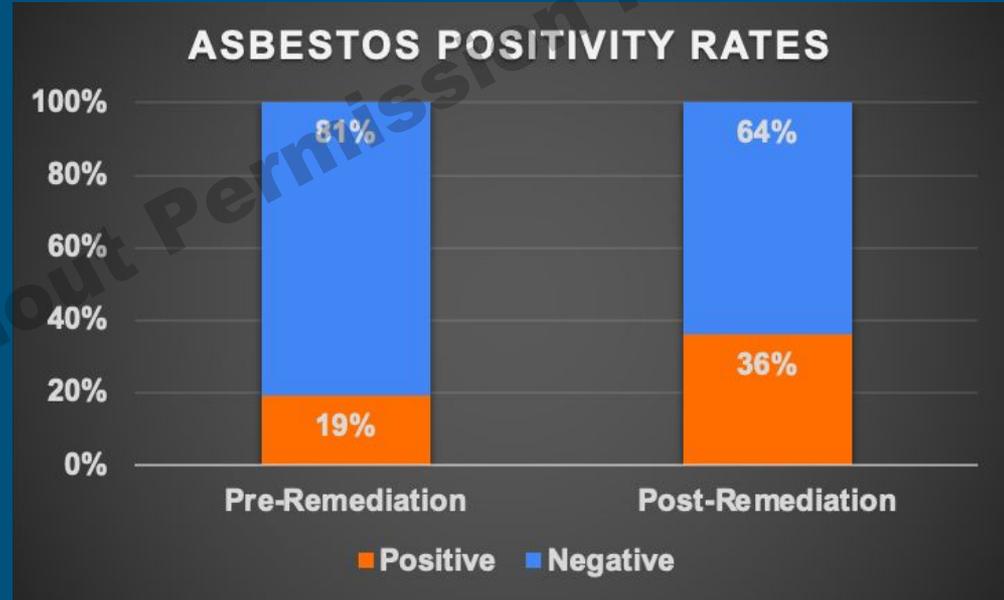


A home with high levels of lead is NOT SAFE to INHABIT.

How Bad Is It? Asbestos Levels in the Community

- **Many homes test positive for asbestos**, pre- and post-remediation (19% and 36%). Even AFTER remediation, one in three homes still test POSITIVE for asbestos, a highly carcinogenic substance, known to cause lung disease and lung cancer.
- **In ONLY 16% of homes was remediation guided by pre-testing**, often because residents are denied access to testing by insurance companies.
- ONLY 64% of homes (n=129) were tested for asbestos (PRE) and half (50%, n=25) of the homes had access to asbestos testing post-remediation, raising questions of uncertainty for the rest of the residents.

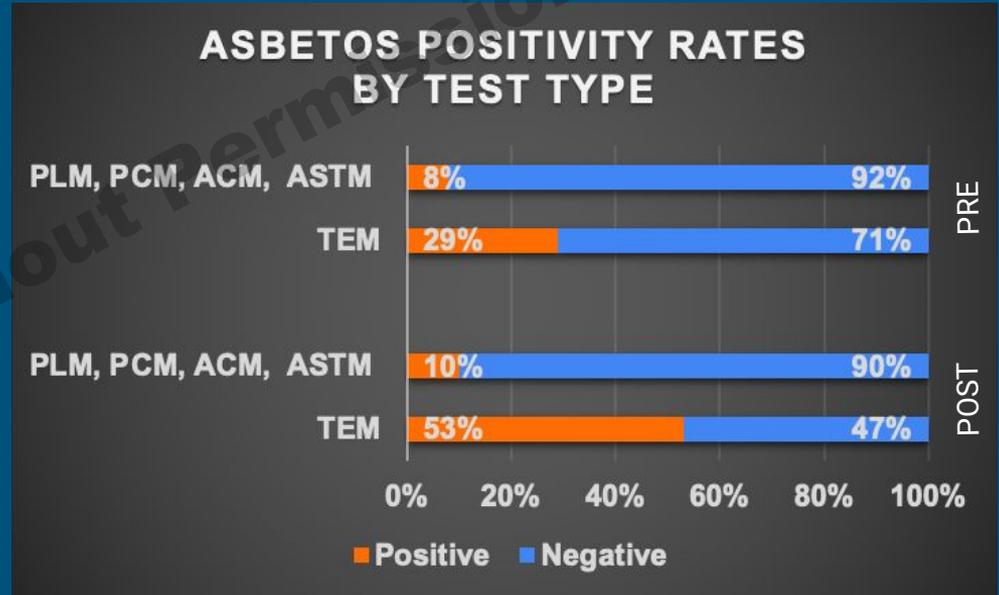
Note: EFRUs cross sectional data, consist of independent samples, only 20% are matched cases.



A home with asbestos is NOT SAFE to INHABIT.

Lack of Standards: Issues with Testing Quality

- **ERROR:** There is a **danger of FALSE NEGATIVES**, due to incorrect testing, raising serious health concerns for the community.
- The **TEM method**, with its superior resolution and magnification, is the **correct** way to test for asbestos in household dust/CBP because it is able to identify extremely small and fine asbestos particles in low concentrations. TEM has 20,000x the resolution of PLM.
- **YET, many laboratories are not equipped to do so** and are using alternative methods with lower sensitivity rates. 56% (PRE) and 40% (POST) of homes were tested incorrectly raising doubts around the validity of results. There is no safe level of asbestos.



STANDARDS for testing methods are NEEDED NOW.

Is It Improving? Heavy Metals (CAM-17)

| | POST REMEDIATION | | | | PRE REMEDIATION | | | |
|-------------------------|------------------------|------------------------|----------------------------|----------------|-------------------------|------------------------|----------------------------|----------------|
| | # Homes Testing (N=50) | Homes Testing Positive | Mean (ug/ft ²) | Std. Deviation | # Homes Testing (N=201) | Homes Testing Positive | Mean (ug/ft ²) | Std. Deviation |
| Barium ^T | 6 | 100% | 436.26 | 793.89 | 56 | 100% | 521.2 | 638.61 |
| Chromium ^C | 6 | 100% | 11.78 | 12.68 | 64 | 97% | 51.26 | 67.63 |
| Copper ^T | 6 | 100% | 92.75 | 88.3 | 58 | 98% | 330.78 | 452.75 |
| Zinc ^T | 6 | 100% | 3753.73 | 6581.98 | 58 | 100% | 5696.85 | 26992.37 |
| Lead ^{PC} | 45 | 96% | 341.37 | 784.74 | 179 | 100% | 286.58 | 665.61 |
| Nickel ^C | 6 | 83% | 15.96 | 25.18 | 60 | 92% | 52.41 | 73.71 |
| Vanadium ^{PC} | 6 | 83% | 232.41 | 537.91 | 57 | 95% | 85.73 | 124.05 |
| Mercury ^T | 4 | 75% | 0.33 | 0.38 | 45 | 62% | 10.82 | 69.71 |
| Cobalt ^{PC} | 6 | 66% | 11.12 | 24.39 | 58 | 88% | 22.51 | 31.84 |
| Cadmium ^C | 6 | 50% | 15.62 | 34.28 | 64 | 56% | 2.5 | 6.02 |
| Antimony ^{PC} | 6 | 33% | 5.21 | 9.4 | 52 | 75% | 26.5 | 66.91 |
| Molybdenum ^T | 6 | 33% | 1.31 | 2.81 | 52 | 46% | 5.5 | 20.37 |
| Selenium ^T | 6 | 33% | 10.91 | 18.37 | 53 | 40% | 6.64 | 16.97 |
| Silver ^T | 6 | 33% | 0.94 | 1.86 | 58 | 24% | 0.76 | 2.33 |
| Arsenic ^C | 6 | 17% | 4.1 | 10.05 | 74 | 80% | 12.11 | 18.27 |
| Thallium ^T | 6 | 17% | 0.97 | 2.37 | 51 | 18% | 0.54 | 3.26 |
| Beryllium ^C | 6 | 0% | 0 | 0 | 54 | 41% | 1.36 | 2.43 |

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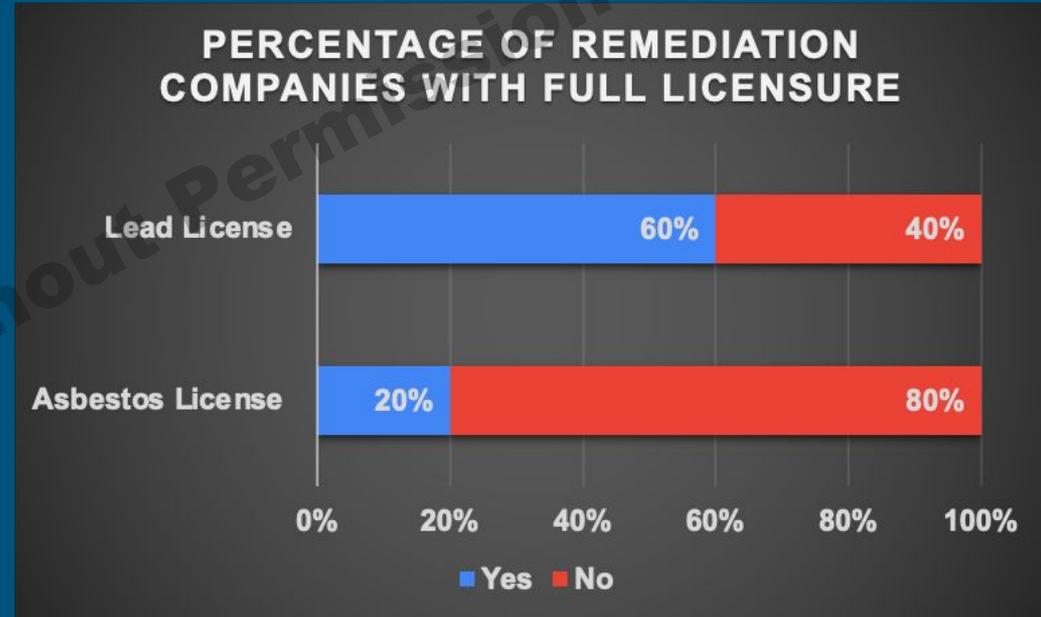
Is It Improving? Heavy Metals (CAM-17)

- Access to CAM-17 testing was only provided in 8–12% of cases post-remediation = System Failure.
- Chromium, Barium, Copper, and Zinc tested POSITIVE 100% of the time.
 - Given the [published studies on the bulk of chromium being nanoparticles of chromium 6](#), a highly cancerous substance, this is extremely concerning.
- As compared to EFRU's pre-remediation contamination map:
 - 5 out of 17 heavy metals either stayed the same or increased in positivity rates
 - 11 out of 17 heavy metals saw a decrease in the mean score
 - We need established indoor household screening thresholds!
- In some cases, post-remediation testing results are coming back far worse. Are these anomalies or failures of the system? We need more information.



Lack of Standards: Issues with Remediation Companies

- A **nightmare** is unfolding for residents. There is a **danger of EXACERBATION of the problem** when remediation companies are not properly equipped to take on a job as intricate as WUI Fire cleanup.
- Residents are scrambling to find help and remediation companies are quick to take jobs. Residents often wait months in the queue to get to the top of the line and then receive invoices for \$50-100K.
- Some remediation companies are charging residents fees for estimates, worsening inequitable access.
- Residents have no idea how best to hire remediation companies, and neither the insurance companies or remediators demand or disclose proof of licensure on a regular basis. Stop wasting money!



STANDARDS for remediation companies are NEEDED NOW.

EFRU Data: Key Takeaways

- EFRU data shows **widespread indoor contamination** in Eaton Fire-affected communities.
- **High levels of CAM-17 metals are found both inside and outside the perimeter of the burn scar** raising concerns for residents about just how far the contaminants traveled, how many people may be exposed to toxins, and what the impact on human health might be. Given recent publications on the nanoparticle size of CAM-17 metals, concerns are high. Trends holding pre & post:
 - High occurrence of Barium, **Chromium**, Copper, **Lead**, Nickel, **Vanadium** & Zinc (80% – 100%)
 - High concentrations of **Arsenic**, **Chromium**, Copper, **Lead**, **Vanadium**, Mercury, Nickel, & Zinc
- **Asbestos is found in 19%** pre- and 36% of homes post-remediation. Only 45% (pre) and 60% (post) of homes were tested correctly. Variable positivity rates based on testing method raise major concerns for false negatives communicated in the community.
- **Residents face challenges interpreting the results** due to little established consensus on safe levels of heavy metals on indoor dust/CBP. Recent scientific studies suggest the potential for **devastating impacts on human health**, particularly those with prolonged exposure.

What are the Recommendations for the Task Force?

EFRU respectfully calls for the Smoke Claims Task Force to:

- Require achievement of post-remediation “**clearance**” before moving residents back into their homes. Insurance and remediation companies should be held accountable for returning homes to pre-fire conditions.
- Encourage CA Department of Toxic Substances and Controls (DTSC) to establish screening thresholds for heavy metal contamination in homes so that residents know how to interpret results and insurance companies know how to return homes to pre-fire conditions.
- Expand access to testing, including other known carcinogens. ZERO homes (post) were tested for cyanide, lithium, VOCs, and PAHs despite strong urging from exposure scientists and toxicologists for the protection of human health.
- Demand insurance companies grant access to testing (homes, schools, businesses) in the burn zone and downwind. If residents have been denied testing, grant access now.
- Remediation companies should require pre-testing to ensure worker safety and produce a remediation plan likely to succeed.
- Declare an ash zone, using evidence-based methods. Protect workers and residents.
- Consider evidence-based explanations for failure of remediation (e.g., homes may face the impossibility of removal of toxins).
- Adopt evidence-based testing methods for both pre- and post-remediation. Note differences between testing for lead in paint vs. CBP and asbestos in solids vs. CBP.



Immediate Requests - Clearance before Inhabitation

Promptly ensure that **every home receives clearance before being inhabited**. If homes are currently inhabited before receiving clearance, please do everything in your power to make sure these residents have access to testing and ALE.

1. Issue a bulletin from the Insurance Commissioner to insurance companies to approve pre- and post-remediation testing, including for those that are living in their homes that may have been previously denied testing. Consider something to the effect of..."It is the department's position that given the contamination data that has come to light regarding the Eaton and Palisades fires, impacted properties cannot be considered habitable and fit for normal use until thorough environmental testing demonstrates that the property has been returned to pre-fire conditions."
2. Within this bulletin please encourage insurance companies to approve post-remediation testing that includes at a minimum CAM-17 Heavy Metals and Asbestos (TEM).
3. Within this bulletin, please stress the importance of achieving clearance before inhabitation. The standard for clearance should be getting homes back to pre-fire conditions.
4. This may require extending ALE in situations where warranted, including for residents who have moved back into their homes prior to having received clearance.

Please help us ensure everyone has a safe and equitable return to their homes.

Smoke Claims & Remediation Task Force

Additional Areas of Research

Many questions remain.

- What are testing best practices, both PRE- and POST-Remediation?
- What minimum licensure standards should remediation companies meet?
- What are remediation best practices?
- If we clean for lead is that sufficient? Do we misunderstand how to address removal of other toxins?
- What explains the varying levels of effectiveness of remediation?
- What is the “clearance” level in homes for CAM-17 Heavy Metals, other than lead?
- What are the “background” levels of contaminants in homes near, but outside the burn/ash zone?
- Under what grounds are residents granted access to full scope testing of their property?
- How many homes have been repopulated in unsafe conditions?

More Research is NEEDED NOW.

What are the Implications for Human Health?

Potential Short-term Health Effects Due to Toxic Exposure

- Headaches, dizziness, & weakness
- Respiratory problems & sore throat
- Skin & eye irritation
- Chest pain & tightness
- Nausea & vomiting
- Asthma
- Reduced liver function
- Fungal infections (histoplasmosis)
- Strange taste in mouth, itchy or watery eyes, dry cough, sneezing & stuffy nose
- Compromise immune system
(making individuals more susceptible to infections like pneumonia & respiratory infections)



What are the Implications for Human Health?

Potential Long-term Health Effects Due to Toxic Exposure

- Lung inflammation, chronic bronchitis, chronic emphysema, lesions, cancer, & death
- Difficulty breathing, respiratory failure, & death
- Chronic headaches & decreased mental function
- Gastrointestinal, cardiovascular, immunological, pancreatic, liver, & kidney disease
- Reproductive problems
- Damage to babies in utero: impaired brain development, learning and behavioral problems, premature birth, & low birth weight
- Neurological symptoms such as seizures, coma, dermatological symptoms & death



Questions?

How can we partner on this?

January 8, 2025
Downtown LA

Looking north towards Altadena,
15 miles downwind



Appendix – Methods: Eaton Fire Contamination Map

- **EFRU** created the **infrastructure** to receive and process professional environmental testing results from standing structures (i.e., homes and garages), after the Eaton Fire, and transparently reflect the de-identified information back to the community
- **Submission** of test results is **voluntary and** participants complete an **intake survey and** sign a **release form**
- **Data processing** procedures:
 - **Redaction:** Each submitted report receives an ID and is wiped of personal information (e.g., address, photos)
 - **Anonymization:** Latitude and longitude – each case is pinned to the map within the sub-divided evacuation zone and no closer than the nearest cross street (5 or more homes must be in the general vicinity for masking)
 - **Sorting:** Each test is sorted into the proper categories (e.g., pre- or post- remediation, soil, air, fabric, surfaces)
 - **Extraction:** A scientist from our team manually extracts key contaminant values into the EFRU database
 - **Standardization:** To enable comparisons standard surface types (e.g., Interior Windowsill = windowsill, sill, WS, WF, window) and consistent units of measurement (ug/ft²) are utilized
 - **Exclusions:** DIY home tests or non-professionals, issues identified with a sample or CoC, missing information
 - **Verification:** A second scientist double-checks the extracted data for transcription errors

Appendix – Methods: Eaton Fire Contamination Map

- **The dataset provides peak (maximum) concentrations for multiple contaminants** (e.g., heavy metals, asbestos, ash) found indoors as well as relevant metadata (e.g., damage to the home). It does not contain the result of every single test for every single contaminant (e.g., if 5 lead samples were taken, this dataset only reports the highest value).
- **EFRU DU volunteers sign a research oriented NDA** before working with the data to further protect residents/participants outside of formal IRB channels, while also following ethical guidelines
- **EFRU volunteers are trained and guided by standard operating procedures (SOPs)**
- **Limitations:**
 - Differences in sampling methods, lab instruments, or lab procedures might introduce noise as the dataset contains test results from many different testing companies
 - Asbestos test methods vary widely in sensitivity, and some labs may rely on less-sensitive methods (like PLM) instead of more-sensitive methods (like TEM)