



Model National Lead Safety Policy

Illustrated by 2023 Volcano Art Prize Entries

LINKS

<https://leadsafeworld.com/directory>

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REFERENCES:

<https://leadsafeworld.com/references/>

DIRECTORY:

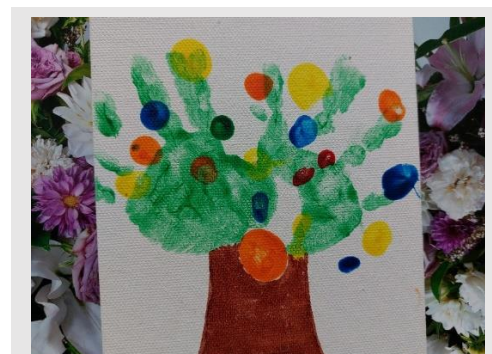
<https://leadsafeworld.com/directory>

SUMMARY:

<https://leadsafeworld.com/summary-natpol>

FULL DOCUMENT:

<https://leadsafeworld.com/fulldoc-natpol>



2023 Volcano Art Prize Entry. Artist:

Azalea Manttan

Title: My Life is in Your Hands

Lead-Safety Message: Please make the world lead-safe and climate-safe by the time I grow up.

Age: 18 months

Description of Work: Hand prints with non-toxic children's paint.

<https://volcanoartprize.com/portfolio-item/my-life-is-in-your-hands/>



Model National Lead Safety Policy Proposal: *Towards a Lead-Safe World*

The LEAD Group's Proposal for National Government Policy on the Prevention and Management of Lead Exposure, Poisoning and Contamination

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Jenna Barnes

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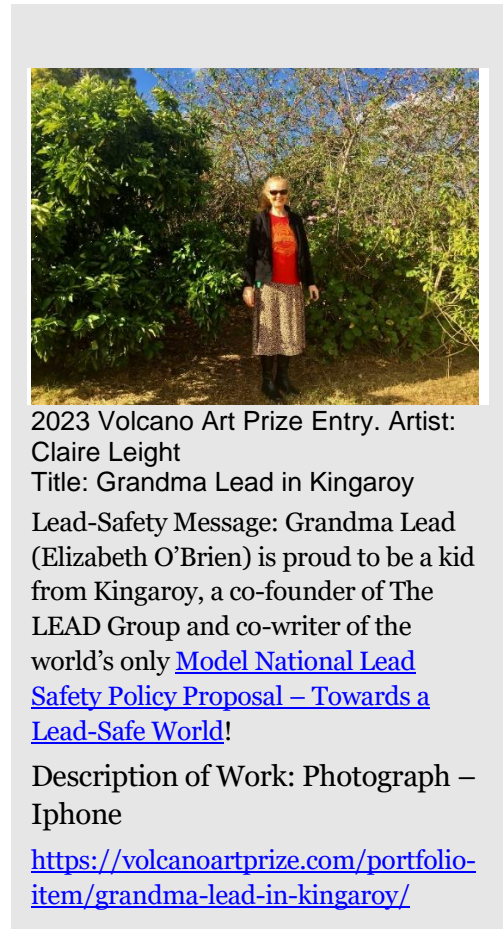
Andrew Hobday

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The LEAD Group Inc., Australia; Lead Aware NZ (New Zealand); and LEAPP Alliance, UK – Lead Exposure and Lead Poisoning Prevention Alliance – A joint initiative of the Lead Containing Materials Association, Lead in Water and Lead Safe World UK (United Kingdom)

11th July 2023



2023 Volcano Art Prize Entry. Artist:

Claire Leight

Title: Grandma Lead in Kingaroy

Lead-Safety Message: Grandma Lead (Elizabeth O'Brien) is proud to be a kid from Kingaroy, a co-founder of The LEAD Group and co-writer of the world's only [Model National Lead Safety Policy Proposal – Towards a Lead-Safe World!](https://volcanoartprize.com/portfolio-item/grandma-lead-in-kingaroy/)

Description of Work: Photograph –
Iphone

<https://volcanoartprize.com/portfolio-item/grandma-lead-in-kingaroy/>



Model National Lead Safety Policy: Towards a Lead-Safe World

The LEAD Group's Proposal for National Government Policy on the Prevention and Management of Lead Exposure, Poisoning and Contamination

Lead is the most studied toxic substance because it is the most common pollutant of the industrial era.

By addressing historical lead contamination will provide a lead-safe world for future generations of all living things. Without lead dampening IQ, our ability to prevent the climate crisis and other existential threats is much greater.

Lead makes climate change worse and vice versa.



2023 Volcano Art Prize Entry. Artist: The LEAD Group

Title: Orange Mudgee Mine News

Lead-Safety Message: ABC News reporters Joanna Woodburn and Micaela Hambrett have done an awesome job in 2023 reporting on acid mine drainage from the former Sunny Corner mine, and lead contamination and potential future lead hazards from Cadia Lead Mine near Orange and the proposed Bowdens Silver Mine at Mudgee.

Description of Work: Collaged screenshots from [Australia's beef, sheep and olive exports could be ruined if lead mine is built in New South Wales, inquiry told - ABC News](#); [Rural communities feeling anxious as NSW government pursues Critical Minerals Strategy - ABC News](#); [Chair of NSW parliamentary inquiry into impacts of metal mining on human health flags integrity concerns - ABC News](#); [NSW parliamentary inquiry submissions warn of lead, gold, silver, zinc mining impacts - ABC News](#)

<https://volcanoartprize.com/portfolio-item/orange-mudgee-mine-news/>

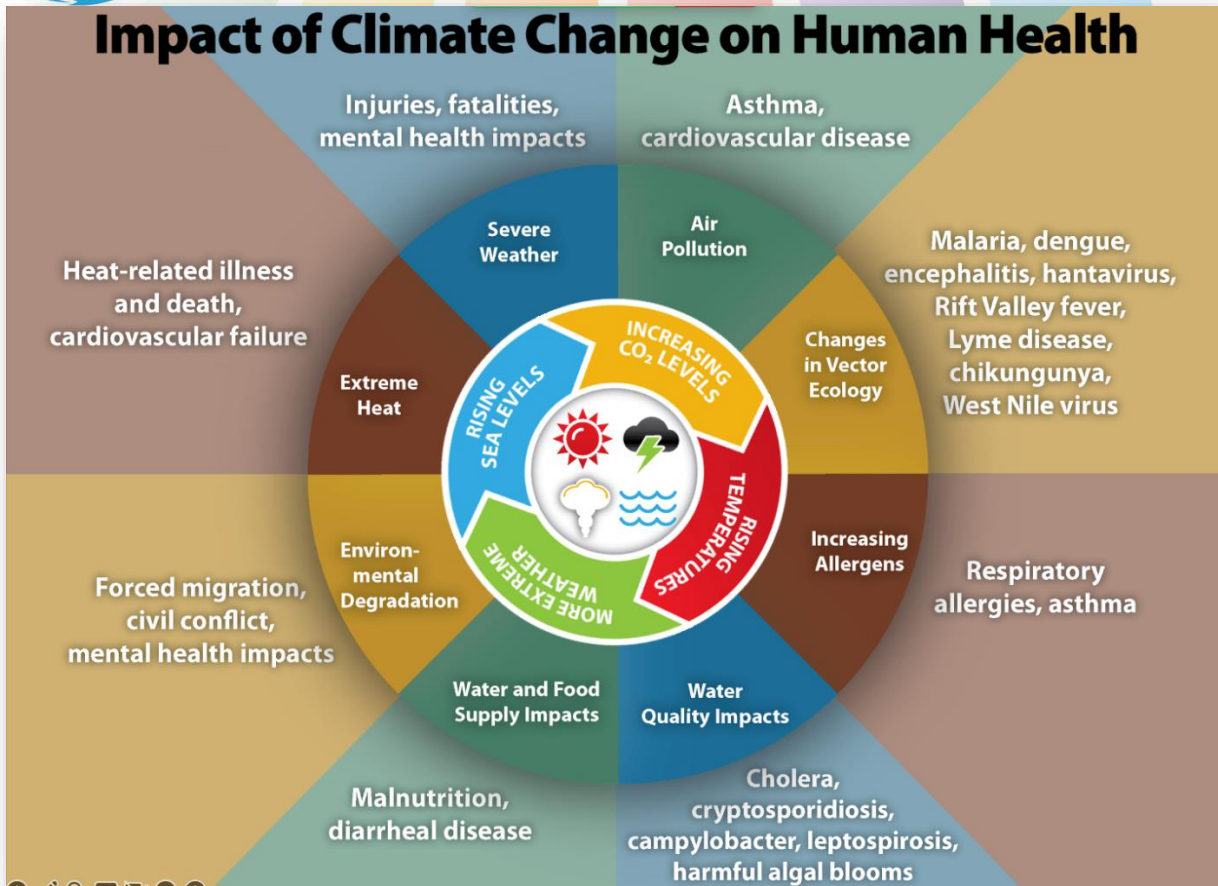


Figure 1: *Impact of Climate Change on Human Health* (CDC 2022a)

In this Figure, lead interacts with climate change impacts in the following ways:

- Due to its natural occurrence in soil, rocks and volcanic emissions, lead contaminates all fossil fuels, thus the burning fossil fuels (which raises CO₂ levels) releases lead into the air which settles in dust, soil, water and sediment (see xiv, below).
- Higher temperatures will increase the acute effects of lead poisoning, known as the “summer disease”, (as discussed below, in this section).
- Extreme weather results in more powerful and more frequent floods, fires, droughts and dust storms all of which can mobilise lead from roofs and roads and transport more of it to rivers and oceans, dust, soil and sediment. From there lead (and other contaminants) get into the food and water supply chains for human, marine and land life.



2023 Volcano Art Prize Entry. Artist: Gordon Ma

Title: Burnt Baobab Trees

Lead-Safety Message: When bushfires or wildfires burn trees, lead is released in the smoke and ash. We need to avert climate crisis!

School: Creative Einstein

Age: 10

Description of Work: Lead (graphite) pencil on paper.

<https://volcanoartprize.com/portfolio-item/burnt-baobab-trees/>



- Rising sea levels carry coastal lead contamination further inland.
- Climate change-related health impacts are all worsened by lead exposure, including:
 - Cardiovascular death is the most common result of lead poisoning
 - Infectious diseases and allergies (lead affects the immune system)
 - Lead contaminated water affects all ages, unlike dust and soil, which affects mostly children
 - Malnourished individuals absorb lead more readily
 - Lead impacts mental health and causes aggression, violence, delinquent behaviours making life worse for climate refugees who are forced into migration or civil conflict

Since the 1960s, links have been made between hot weather and lead poisoning. Australian research revealed an increased number of hospital admissions for childhood lead poisoning during summer ([Freeman 1969, 1970](#)).

Seasonal Incidence: Most of the children, and in particular those with acute encephalopathy, presented in the hot summer months, December to February, but cases occurred throughout the year, often precipitated by an intercurrent infection. Children with moderately severe poisoning may seem well during the winter months, but tend to develop symptoms during the hot summer period. The reason for this is not clear. Solar radiation, which increases the synthesis of vitamin D in the skin, may aid absorption of lead, and factors causing dehydration or acidosis, which like infections mobilize lead from the bones, may be more common in the hot weather. ([Freeman 1970](#)).

Summer disease doesn't only affect children. In 2009 in Esperance, WA, over 9,000 nectar-eating birds died of lead poisoning mostly on the hottest days that summer. This was due to lead ore dust which escaped from open conveyor belts loading onto open hull ships. At the LEAD Group, we receive numerous calls from people who are lead poisoned, some of their stories have been:

- A firearms instructor was "very short-tempered" and when he worked in poorly ventilated indoor ranges he reported having violent mood swings. He said that when working outside in the sun, he knew he's going to get a "lead dump" – experiencing symptoms like hot flushes, breaking out into a sweat and feeling like he was "spontaneously combusting from inside". After work, he'd experience short term memory loss and get a metallic taste in his mouth.



2023 Volcano Art Prize Entry. Artist: Rohan Calvert

Title: MIW Lead Safe Rooftop Remediation

Lead-Safety Message: Men in White (MIW) does lead-safe paint remediation in inner and eastern Sydney. Before photo on left, after on right. Rainwater collection area was also remediated to ensure no detectable lead in drinking water from back roof.

Description of Work: iPhone photos.

<https://volcanoartprize.com/portfolio-item/miw-lead-safe-rooftop-remediation/>



- An old English sheepdog who had become lead poisoned from chewing old painted furniture, would have fits when he got hot.

The countries that don't prioritise lead exposure and lead poisoning prevention will be left behind.

Lead is the highest priority paediatric health problem in the United States because of the cost of dealing with the long-term effects and the massive return on investment of lead abatement and lead exposure prevention.

A study "Half of US population exposed to adverse lead levels in early childhood" ([McFarland et al 2022](#)) estimated that in the US alone, over 824 million IQ points were lost during the 100-year era of leaded gasoline use.

Typical human lead exposure in ancient times has been estimated by [Flegal and Smith \(1992\)](#) to be 0.016 micrograms per decilitre ($\mu\text{g}/\text{dL}$), as represented by the single dot on the first body in Figure 2, below.

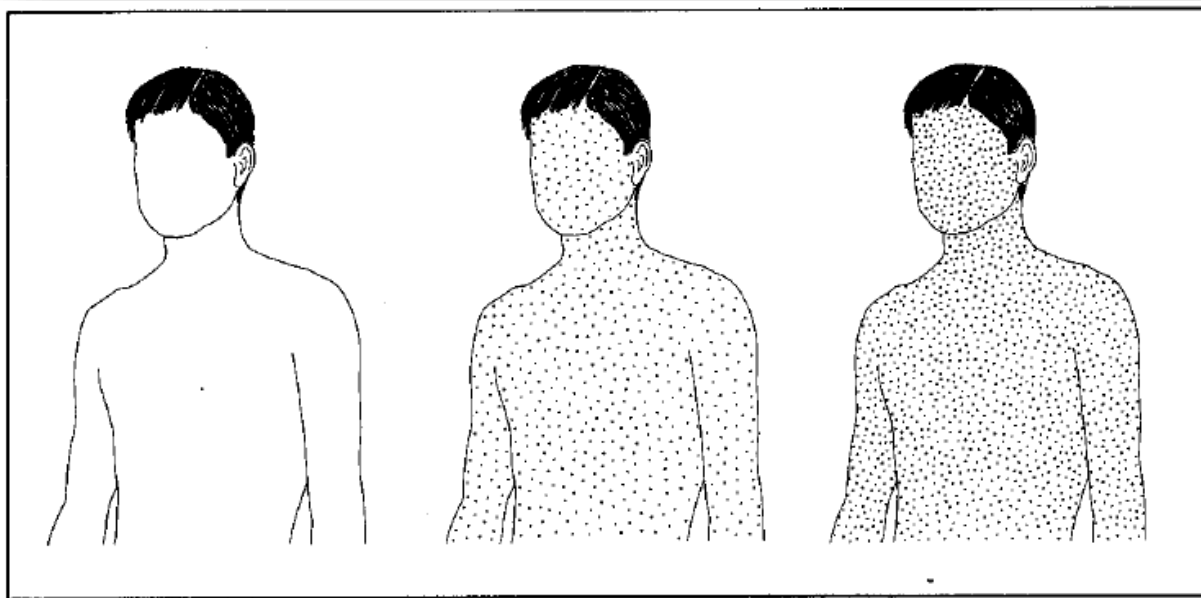


Figure 2. Body burdens of lead in ancient people uncontaminated by industrial lead (left); typical Americans (middle); people with overt clinical lead poisoning (right). Each dot represents $40\mu\text{g}$ of lead. Source: Patterson et al, 1991; adapted from NRC, 1980. (NRC 1993, Figure 1-1, page 15) (Figure and caption reprinted with permission from *Measuring Lead Exposure in Infants, Children, and Other Sensitive Populations*, 1993, by the National Academy of Sciences, Courtesy of the National Academies Press, Washington, D.C.)

Lead is a heavy metal that is neurotoxic and negatively impacts learning behaviours and every organ in the body. It is mainly stored in the bones and teeth (which begin to develop in the first trimester) and can be released back into circulation for many reasons, including certain triggers, like pregnancy and lactation (thus posing a risk to the next generation even after successful public health measures have reduced current exposure), and menopause; as the bones begin to demineralise during ageing; and when the individual is exposed to increased temperatures. Australian researcher, Manish Arora and his team established that



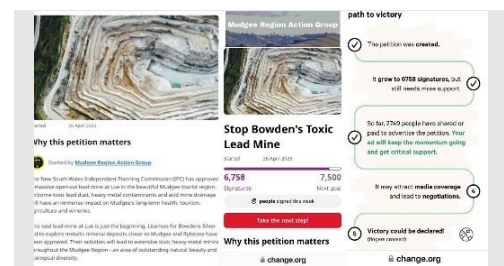
“In ASD [Autism Spectrum Disorder] cases, higher [yet still relatively low] lead levels were observed over the prenatal period and first 5 months postnatally” in the lost baby teeth of Swedish children diagnosed with ASD compared to their non-ASD twin ([Arora et al 2017](#)).

“Persistent bioaccumulative toxic chemicals (PBTs) [such as lead] are of particular concern because they remain in the environment for significant periods of time and concentrate in the organisms exposed to them” ([US EPA 2022](#)).

Human-generated lead pollution from all sources can contaminate air, land, waters and sediments and poses an exposure risk to all living organisms.

Leaded petrol/gasoline and the consequent lead exposure of every organism on earth has rightly been described as *the* mistake of the twentieth century.

Lead in air continues to be a problem in urban areas due to the continued use of leaded AvGas, diesel and unleaded petrol, burning of fossil fuels and the past use of leaded petrol/gasoline, and this is due to re-entrained road dust, exhaust from old lead-petrol-using vehicles ([BBC & Edwards 2021](#), [Resongles et al 2021](#), [Gioia et al 2017](#)). Air lead pollution aside, the global elimination of leaded petrol ([O'Brien 2021](#)) does not on its own stop lead from petrol from reducing IQ and shortening longevity.



2023 Volcano Art Prize Entry. Artist: Mudgee Region Action Group
Title: Stop Bowdens Toxic Lead Mine
Lead-Safety Message: It's time for you dear readers to take action and sign the petition at

<https://www.change.org/p/help-stop-bowden-s-toxic-lead-mine>! This could

be the first of many lead mine and lead mine expansions to be stopped by wonderful people like you who are creating a lead-safe world for our children!

Description of Work: Screenshots from [Petition - Stop Bowden's Toxic Lead Mine - Change.org](#) collaged together in Powerpoint.

<https://volcanoartprize.com/portfolio>

[o-item/stop-bowdens-toxic-lead-mine/](https://volcanoartprize.com/portfolio-item/stop-bowdens-toxic-lead-mine/)

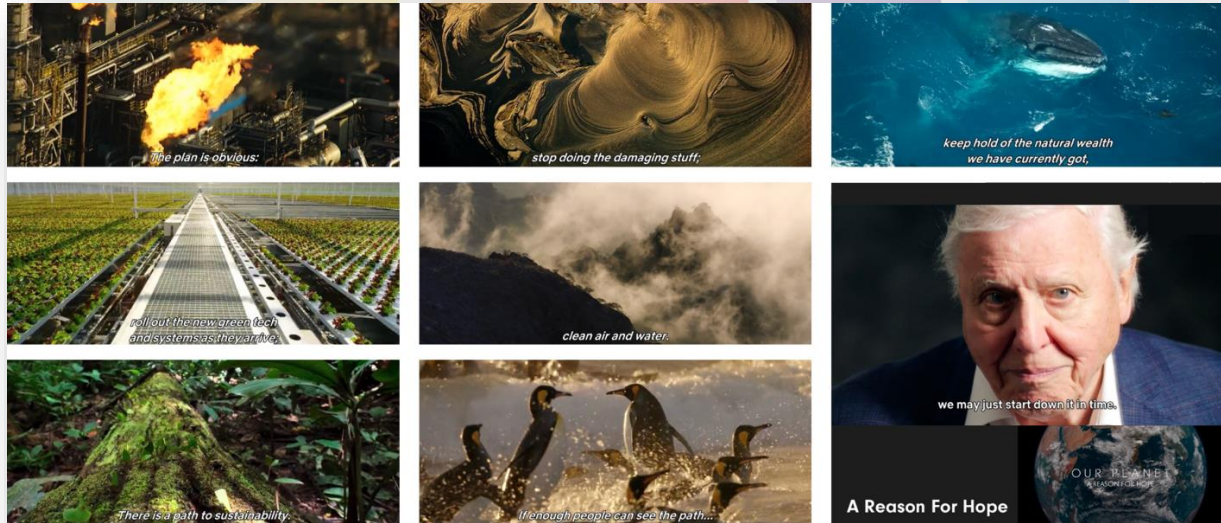


Figure 3. As David Attenborough says, “The plan is obvious: stop doing the damaging stuff...” ([Attenborough 2019](#)) [Video screenshots collaged by Lucinda Curran and Elizabeth O'Brien]

Those two huge impacts on Global GDP and health will continue until petrol-lead contaminated dusts, soils, waters, sediments, and waste dumps are also cleaned up. Lead contaminated materials generated in cleaning up the world, could be disposed of as fill, in closed-down or mined out pits of heavy metal and fossil fuel mines (see xvi, below).

According to [Dr Valerie Hickey \(2023\)](#), of the World Bank: [UNICEF \[2020\]](#) and Pure Earth [July 2020] estimate that 1 in 3 children – or up to 800 million globally – have blood lead levels at or above 5 micrograms per deciliter [$\mu\text{g}/\text{dL}$] when any lead disrupts a child's neurological development and can cause premature death” (02 February 2023). Further to this, “it was estimated in 2013 that a blood lead level of 1.0 $\mu\text{g}/\text{dL}$ was associated with a one-point loss in IQ score, confirming that there is no lower safe threshold of exposure” ([Taylor and Lanphear 2020](#)).

Lead is the most widely researched toxicant. [The US National Toxicology Program \(NTP\) \(2012\)](#) monograph, *Health Effects of Low-Level Lead* is a summary of recent research and is over 1000 pages long. Yet, since 2012, associations between lead and the following health or behavioural impacts have been unearthed through research:



2023 Volcano Art Prize Entry. Artist: Rohan Calvert
 Title: MIW Lead Safe Sign Remediation
 Lead-Safety Message: Men in White (MIW) is an award-winning painting service in inner and eastern Sydney. Before photo on left, after on right. The *Town and Country Illustrated Newspaper* exterior wall sign was uncovered during renovations and made lead-safe to become a feature interior wall.
 Description of Work: iPhone photos.

<https://volcanoartprize.com/portfolio/o-item/miw-lead-safe-sign-remediation/>



- Preeclampsia
- Pre-term birth
- Low birth weight
- Cataracts

([Vella et al 2020](#), [Roberts et al 2020](#))

Because lead exposure is so prevalent and lead is mainly stored in bones in place of calcium, virtually all pregnant women will experience a rise in their blood lead level during pregnancy as the foetus attempts to draw calcium from the bones. Even maternal blood lead levels below 1 µg/dL will decrease birth weight and gestational age in the same way that smoking during pregnancy does and “a 0.1 µg/dL increase in second trimester lead [is] associated with lower birth weight and pre-term birth” ([Rabito et al 2014](#)).

From the statistics that are emerging on health effects associated with lead exposure, clearly everyone has been affected by lead to some degree even though the vast majority of people are never tested or diagnosed. This silent global pandemic of lead poisoning stops virtually everyone from reaching their full cognitive and longevity potentials, and speeds brain ageing.

The World Health Organisation (WHO) reported in [Childhood Lead Poisoning](#) in 2010 that every dollar spent on preventing lead exposure returns between US\$17-220 in benefits. Put another way, every dollar spent on lead safety will be repaid 17-220 times in saved medical and educational costs, reduced crime and improved lifetime earnings. “This cost-benefit ratio is better than for vaccines, which have long been described as the single most cost-beneficial medical or public health intervention” ([WHO 2010](#)).

The United Nations ([Tsai and Hatfield 2011](#)) reported on the longer term benefits to governments of increased lifetime earnings of those who are not lead poisoned, and the resultant increase in revenue raised through income tax. In this report [Tsai and Hatfield \(2011\)](#) estimated a global annual benefit of US\$2.45 trillion (4.27% of global GDP per annum) due **only** to the phaseout of leaded petrol/gasoline (see xiv, below).

Cost-benefit analyses demonstrate substantial returns on investment into lead abatement, and lead poisoning and contamination prevention and management.



2023 Volcano Art Prize Entry. Artist: Joshua Fatsea

Title: Keep Red Eyed Tree Frogs Lead Safe.

Lead-Safety Message: They are threatened due to habitat destruction and degradation as they are particularly sensitive to pollution and climate

change. Stop burning their Central American rainforests to grow beef!

School: Creative Einstein

Age: 10

Description of Work: Colouring pencils on paper.

<https://volcanoartprize.com/portfolio-item/keep-red-eyed-tree-frogs->