



October 15, 2021

## Human and Biodiversity Costs from this deadly Global Mercury Crisis - A Solution

Approximately 18 - 20 million impoverished artisanal and small-scale gold (ASG) miners including ~4.5 million women and ~600,000 children under the age of 15 dangerously toil daily in ~ 80 Countries using mercury, a deadly neurotoxin to extract gold from ore.

ASG miners' ore processing is the Planet's largest anthropogenic source of deadly mercury pollution overtaking coal fired plants in 2017.

Mercury is documented by Oxford University earth scientists in 2021 to stay airborne as long as one year.

Eighty percent of the global artisanal gold supply is produced from processing centers which are largely responsible for the collective annual discharge of 2,000 tonnes of mercury; not the wrongly accused informal ASG miners which produce 20% of the gold.

Mercury is a precursor to Methylmercury, an even deadlier neurotoxin at 100 times more potent than elemental mercury, and with unknown biomagnification effects.

Methylmercury is produced by human bacteria upon contact or inhalation, and anaerobic microbes in a moist environment such as the Amazon.

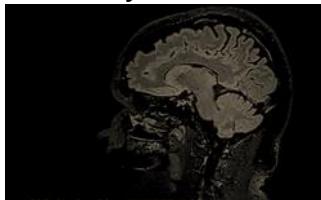
These informal miners all largely have undiagnosed mercury poisoning earn 6 dollars a day to support typically a family of 6 and believe mercury poisoning even if they know its effects on their health, is generally accepted as part of the aging process.

They reluctantly leave their gold rich tailings to the processors in lieu of cash for rent of the facilities and services. They have no other options.

ASG miners use mercury to amalgam with gold in crushed ore which they heat at a high temperature vaporizing the mercury to the environment leaving the gold which requires refining to produce 20% of the world's gold supply used in our jewellery, our iPad's, iPhone, computers, and other electronics devices.

The morbid irony lies in the fact the same mercury used to extract gold for consumers jewellery, iPads, iPhones, computers, and other electronics devices is polluting the air we all breathe, contaminating our drinking water, polluting the Oceans we swim, poisoning the fish we consume causing health issues and global biodiversity destruction.

Both mercury and Methylmercury penetrate the blood brain barrier, the placenta, and the central nervous system.



To make a sustainable change, we have initiated Climate Action in Ecuador's Portovelo-Zaruma mining district 1,200 meters high up in the Amazon Andes where 65 APROPLASMIN\* Members own and operate 68 of 87 whole ore mercury amalgamation Chilean processing centers.

Zaruma is one of Ecuador's 5 UNESCO World Heritage Sites and the world's pinnacle and most impactful source of deadly toxic mercury polluting the Amazon rivers destroying Peru's Puyango-Tumbes River basin resulting in a recent internationally supported law-suit for human health threats, biodiversity destruction, etc., estimated at \$USD 35 billion.

A 1999 survey by the Swedish Environmental System estimated discharges of mercury at 40 Kg per year in the River Siete and 160 Kg per year in the River Calera.

The Portovelo-Zaruma mining district is responsible for the annual discharge of 303 kg of mercury into our environment from burning gold the amalgams.

These 87 centers (110 in 2010) situated along one-square mile on the Calera and Amarillo riverbanks are collectively responsible for the annual discharge of 1.9 million tonnes of acidic toxic tailings surface sludge poured directly into the rivers from processing 50,000 local and neighboring miners' ore and toxic tailings.

This toxic pollutant is laden with 222 kg of mercury providing mobility for mercury, 2,033 tonnes of cyanide, mercury-cyanide complexes, arsenic, lead, and other heavy metals.

The pollutant is fluvially dispersed zigzagging down the Andes throughout the Amazon rivers killing all local biota, contaminating the riverbanks and soil, poisoning local terrestrial species, and contaminating drinking water to empty into the Pacific Ocean 350 Km west, poisoning the fish consumers eat especially tuna, where mercury bioaccumulates the most.

December 17, 2020, UK Super Mega Rock Star @robbiewilliams reported he 'almost died' from mercury poisoning over his seafood habit. He had the highest level of mercury in his body ever recorded in UK.

We are in advanced discussions with several APROPLASMIN Members including their President elect "hopeful" to whom we have provided preliminary design schematics to convert an existing center and prototype the world's 1<sup>st</sup> mercury free 60 tonne/day state-of-the-art ore and tailings processing center.

"We propose" to use a solution extracted from bitter cassava plants, a cyanogenic plant-based extract as a gold leaching lixiviant for the first time in the history of the mining industry" Dr. Marcello Veiga, P. Eng.

Conversion of one of the 87 Portovelo-Zaruma Chilean processing centers to manipueira processing contributes to the UNEP Global Mercury Partnership overall goal by eliminating that center

- monthly use of 2.2 kg mercury,
- monthly use of 2 tonnes of toxic cyanide salts,
- pro-rata discharge of 1.9 million tonnes of toxic tailings wastes laden with mercury providing mobility for mercury, tonnes of cyanide, mercury-cyanide complexes, arsenic, lead, and other heavy metals,
- pro-rata release of 303 kg of mercury to our environment from burning the gold amalgams

aiming to mitigate further human and child in utero health threats, local and global biodiversity destruction from this one center at a time.

The manipueira processing center will be equipped with innovative technologies incorporating processes based on years of R & D at the University of British Columbia (UBC) Norman B. Keevil Institute of Mining Engineering.

Once completed, the center will be made available for demonstrations and the plant specifications will be blueprinted and published open source for worldwide replication.

We're seeking social awareness and impact investment capital to fund our climate action initiative to implement our Tailings Remediation Action Plan (TRAP) innovation in Zaruma.

Visit our site and sign up for our Blog to stay current.



[Alchemy Mining Group, Inc.](#) ("AMGI")



 An Innovation provider to #MakeMercuryHistory in ASG miner's ore processing and profit proudly owning sustainably reclaimed tailings gold, a globally wasted commodity

Bruce A. Cosgrove, B.Sc., M.Sc. (Solution Chemistry) President/C.E.O.  
 | [Research Gate Profile](#) | [LinkedIn Profile](#) |

October 14, 2021, the Company filed a [Partnership Request](#) to the UNEP Global Mercury Partnership to form a partnership for the Artisanal and small-scale gold mining and mercury waste management sectors.

July 01, 2021, an 8-page [digital interview](#) with Bruce was published on Skillings Mining Review web site.

July 17, 2019, Bruce published "[Amazon Mercury Pollution — A Global Issue — A Solution](#)" on Medium. The Article has more than 15,600 views to date.

\* Asociación de Propietarios de Plantas de Beneficio Mineral (Association of Owners of Plants of Ore Reduction, Smelting and Refining of Mineral Substances of El Oro Province in Portovelo-Zaruma)

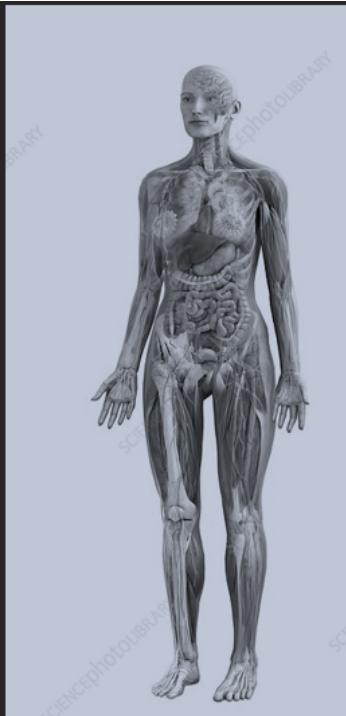
## Mercury poisoning Symptoms

Some adults can have inflammation of the gums, which is also known as gingivitis.

Adults can experience upset stomach. Severe exposure can lead to kidney failure.

Pregnant women need to be especially careful because certain levels of exposure can affect fetal brain development.

Both adults and children may experience numbness, tingling, tremors, and rashes can appear on various parts of the body.



Both adults and children can experience mental confusion, some irritability, memory loss, shyness, or withdrawal. Tremors are also common in adults.

These symptoms are more common in adults but have been in exposed children.

Children may experience swelling of the hands and fingers. The skin may also peel.

Children who are exposed may also have swelling and peeling on their feet and toes.

Thank you