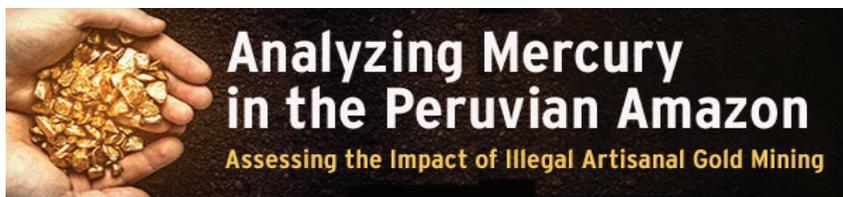


## | WEBINAR QUESTIONS



### **Are there any areas of destroyed forest that have re-forested after the gold mining operations have moved elsewhere?**

Yes, there are areas that have been reforested. The challenge is that there is no good knowledge on how to reforest. Our research center has a program working on this. We test native species for its usefulness on remediation, we currently have 115 acres across North Carolina for research purposes. We hope that with this knowledge we can work with government and NGOs to reforest areas more effectively.

### **How long does it take to regenerate the forest after gold mining has stopped and moved elsewhere?**

This ultimately depends on the level of degradation. On a worst-case scenario, it could take up to 100 of years to come back since most soils and water tables are altered.

### **Did you find already any kind of malformation in newborn babies?**

Our team consists mainly of environmental scientists. However, we do support medical teams, who are starting to look at the effects on the population. Initial tests on these studies show neurological and cognitive impacts. This is an area that does not have a robust healthcare system. There hasn't been an assessment yet on this, but we hope it changes in the future.

### **Do you expect most of the gold mines globally to have mercury contamination?**

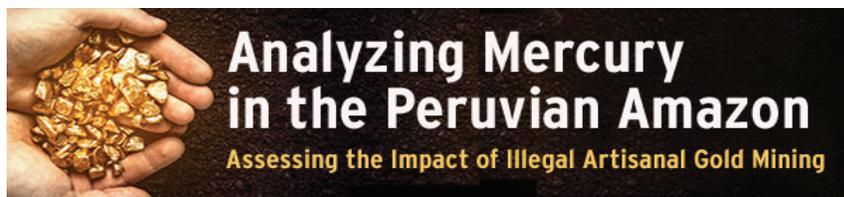
If there are gold mines with mercury amalgamation as their major extraction process, then we would expect extensive mercury contamination in ecosystems in the areas around mining activity.

### **How are miners obtaining the mercury?**

In most of the areas where mining is either controlled or illegal, miners get mercury from the black market. Most of it enters it through illegal international transport between the countries that produce it and the ones that use it for mining. Currently, Mexico is the number one producer of mercury used for illegal mining activity.

### **Great presentation! Following your Hg measurements Gold-shops in "La Rinconada:" IS there anybody following the Gold harvested by AGM to the markets in USA, Europe or Asia?**

That is a poorly studied part of the illegal mining which requires a lot more effort. There has been more initial work to trace back illegal gold from where it was produced to where it goes. There is a good report in the January 2018 article of the Miami Herald where gold is traced back to the Madre de Dios region.



**How much annual net income does an average person actually acquire from this gold mining? Does the miner actually realize much the gold's value is or are they just paid a small percent of the gold's value by the shops and brokers?**

Individual miners are part of a larger group of people on this activity. They earn an average of \$100 a day, which is highly significant for these areas it is several times higher than what they would be paid as farmers.

**What are the impacts of mercury in male/female reproductive system?**

Most effects are neurological, as well as organic effects on the liver and kidney. It is known to increment impotence in men.

**How do you clean the hair samples to remove exogenous contamination?**

This is a concern in areas where there is both consumption of fish and exposure to mercury vapor, since the two routes can be confused. To isolate the effect of fish consumption, you would analyze for methylmercury. In the case we show here, the villagers that live far away from the mining are not exposed to mercury vapor and they are used as control group. To answer this question, it is very difficult to remove mercury contamination once it permeates into the hair, butalconox detergent can be used when interested on doing this.

**The Draft that was published for comments in 2018 suggest that there is little to no information about mercury pollution in tropical areas, including the**

**Amazon. Did you participate in or provide information to the elaboration of the 2019 Global Mercury Assessment? If not, why do you think the authors of the GMA 2019 have not taken into account the information produced by CINCIA?**

We do participate, we are members of the UN efforts to develop assessment on Global Mercury.

**Concerning the relatively high concentrations of mercury in forested areas compared to mining areas; does this mean that mercury is accumulating in the forests?**

This is where doing analysis sometimes raises more questions than answers. We find that there are lower levels left in the sediments after mining with mercury when compared to the forest areas. It does not necessarily mean that it has high levels, it can also be explained by the fact that the amount of sediment is lower. Therefore, mercury is highly mobile because there is no carbon in the soil to accumulate on, and it moves into the mining pits as it is carried by water. Since the mining areas are high, sediments move around and can show this effect.

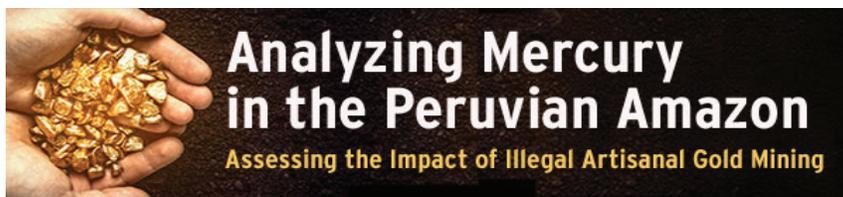


**Luis E. Fernandez**

Executive Director, Center for Amazonian Scientific Research  
Research Assistant Professor,  
Department of Biology  
Wake Forest University



## | PRODUCT QUESTIONS



### Could you mind explain more about the principle of operation of Milestone's DMA-80 *evo*?

The DMA-80 *evo* thermally decomposes the sample matrix to release all mercury compounds. When these species reach the catalyst tube, they are converted to elemental mercury and subsequently retained in a gold amalgamator. During the detection step, mercury is released from the amalgamator and detected by atomic absorption spectrophotometry at 253.7 nm.



**Roberto Federico-Perez, PhD**  
Product Specialist  
Milestone, Inc.

### How can you detect mercury in hair by using Milestone's DMA-80 *evo*?

Hair samples are analyzed using our standard procedure. After weighing and loading the sample, it undergoes thermal decomposition and mercury is detected by atomic absorption spectrophotometry after it is catalytically transformed to its elemental form.

### Can the DMA-80 *evo* perform analysis of mercury in ores, mineral samples?

Yes, the DMA-80 *evo* can be used for this application. We currently have application notes available describing the processing of a variety of geochemical samples.