

Mercury Migration

Deadly Pathways to Developing and Indigenous Communities



The Yanacocha Mine in Peru owned by the Newmont Corporation. Copyright: Ernesto Cabellos

Byproduct Mercury: A Forgotten Source of a Global Poison

Early in the summer of 2000 a spill of mercury from trucks leaving the largest gold mine in

South America sent shock waves around the

world when it poisoned several highway communities and set in motion a real test of corporate responsibility (See inset story).

The disastrous accident at Choropampa in Peru underscores the potential mercury has to undermine human and environmental rights, but it also points to a universally overlooked mercury source. The mercury trucked from the Yanacocha mine to Lima was not being used to extract gold. It was there because the mine cannot really extract gold from rock without also extracting mercury.

Mercury typically occurs naturally with other low-temperature melting ores such as zinc, copper, and gold ores. Application of cyanide-heap-leaching technology has contributed to increased gold production. But this process also volatilizes and liberates mercury, releasing large amounts that are either captured or released into the atmosphere or mine tailings. As most of the world's gold and copper mines are now located in developing countries and

often in remote and rural areas, and much of what is produced elsewhere is sold to developing countries, it is clear that a disproportionate burden from dealing with byproduct mercury will be borne by communities and peoples in developing countries.

The first, most immediate implication of byproduct mercury is its impact on workers and their families. The US Department of Labor's Mine Safety and Health Administration reports that increased mercury production is creating serious chronic health risks in the precious metals industries for workers and their families. According to a 1997 report, out of 690 samples taken at 72 gold and silver mines across the US, there were 86 cases of overexposure to mercury. Fifty-percent of

these overexposures were more than twice the permissible limit, and in the worst cases exposure ranged as high as 50 times the permissible limit. Mine workers' families were also found to be at risk.

Though cumulatively coal fired power plants are the predominant source of atmospheric mercury emissions, the three largest point sources for mercury emissions in the

United States are the three largest gold mines there. Anglo Gold reported a peak of more than 4 metric tons of mercury emissions from its Jerrit Canyon mine in one year, while the Twin Creeks and Gold Query mines reported emissions in the range of 0.5-1 ton each per year. By contrast, the average coal fired power plant emits around 200 kilograms of mercury.

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Choropampa: The Price of Gold

Early in the Summer of 2000, a flask containing elemental mercury leaked 151 kilograms of its contents while being transported in an open-bed truck along a 60 kilometer stretch of road that runs through three rural farming communities high in the Peruvian Andes. As the villagers watched the mercury spill into the street, children ran to play with it and their parents scooped it up in tin cans and small pails -- thinking it might be valuable as a medicine.

The container of mercury, one of nine 200 kilogram flasks being carried on the truck, was traveling from Minera Yanacocha, the largest gold mine in South America, and a joint venture owned, operated, and managed by Denver based mining giant Newmont Corporation. The mercury, produced as a byproduct of the widely used cyanide heap-leaching technology, was being trucked 700 kilometers to Lima where it was to be sold for use in medical instruments.

The Canary in the Gold Mine

The spill has raised two very important issues. The first, dealt with elsewhere in this paper, is in regard to the overlooked, massive source of mercury that is generated as a byproduct from gold and other types of mining. The second, is in regard to the human rights implications regarding mercury producing or mercury based operations, particularly in developing countries and the responsibilities of transnational corporations.

In the two years since the spill, hundreds of people from the three villages along the roadway where the mercury spilled off of the truck — Choropampa, San Juan, and

Magdalena — have reported skin, kidney, neurological, pulmonary, reproductive, respiratory, and vision problems. There have been stillborn babies; there are abnormal cases of blindness; there is evidence of developmental deficits in young children; animals are reported born deformed; villagers complain of blistering skin, migraine headaches, and sleep disorders; they have unfamiliar back aches, and odd tremors in their bodies.

Many of these symptoms are indicative of acute and chronic mercury poisoning, some similar to ailments reported after a chemical company dumped a hundred tons of mercury into Minamata Bay, Japan, in the 1950s. Yet villagers say government doctors at the local health clinic tell them their symptoms are purely psychological, and the general manager of Yanacocha pronounced on television that the entire community suffers from collective psychosis, insisting that a two-year old spill could not still be affecting anybody.

Dauids Against the Gold Goliath

While Yanacocha executives continue to insist the villagers must be suffering from some kind of hysteria because blood and urine tests are inconclusive, an independent investigatory commission concluded otherwise. In its July 2000 report, a commission contracted by the International Finance Commission concluded that, “it is anticipated that the impacts of the spill will continue to be felt in the local communities long after the initial symptoms of mercury poisoning present themselves.”

After several failed attempts to negotiate directly with Yanacocha that included blocking the highway leading to the mine and interventions from international mediators, non-governmental organizations, and foreign press, more than a thousand villagers filed a class action suit in Denver against Newmont Mining Corporation to have their case heard in state courts in Colorado. This appeal has twice been rejected by two different judges arguing the case ought to be heard in Peru.

The attorney representing citizens of the three communities was recently quoted in a Reuters news article as saying that “Our *campesino-*

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type clients cannot possibly get a fair trial against a mining giant like Newmont in Peruvian courts.” Lawyers are currently preparing their appeal to Colorado courts, and say they will take their case to the state’s supreme court if this appeal is denied.

But beyond the particulars of the Choropampa case, lies the profound issue of the toxic injustice perpetuated when transnational corporations exploit developing communities that possess weak regulatory structures, far from the scrutiny of their home governments, with virtually unlimited power over rural, remote, and frequently politically and legally marginalized communities.

Stricter regulations created over the last 30 years in developed countries have led to improved environmental and public health conditions. But there is no mandate nor guarantee that such precautions, entailing significant costs to implement, will ever be employed. Indeed without a global mandate, the likelihood is that they will not be.

Recipe for Environmental Injustice

As most of the world’s gold and copper mines are located in developing countries and often in remote and rural areas, and much of what is produced in rich countries is sold to developed countries, it is clear that a disproportionate burden from dealing with byproduct mercury will be borne by the poor in developing countries. This, combined with a lack of clout by these communities in the face of powerful transnationals holding sway even over national governments, is a recipe for environmental injustice.

What is seriously needed is a global response to the problem that will mandate legally binding action to curb the mercury threat from governments and transnationals alike.

It’s estimated that 4-8 percent of total mercury emissions in the U.S. come from gold mining.

Still, the amount of mercury released from emissions from gold and other mining is considered by experts to be but a small fraction of mercury that gets captured in the process, condensed into liquid form, and sold in the global marketplace. But companies rarely report this byproduct mercury from mines, they simply sell it to brokers -- making it currently impossible to accurately quantify global annual production rate of byproduct mercury.

The UNEP global mercury assessment estimates that the amount of byproduct mercury captured from gold mining every year could be as much as 400 metric tons. If this number is accurate, then byproduct mercury accounts for 40 percent of the total primary mercury entering the world market.

But if we use Yanacocha’s mercury production as a baseline, the picture is far more alarming. In 2000 the Yanacocha mine in Peru produced approximately 4 million ounces, or 120 tons of gold — 5 percent of the world’s production.

“If gold mining is not already the single largest point source of primary mercury in the world, then it certainly will be within a few years.”

In the same year the mine produced 70 tons of mercury that we know about, excluding the amount lost at various stages in the cyanide process. Around 80 percent of the world’s gold mining now uses cyanide technology. Assuming similar conditions globally to the rock mining in Peru, the total amount of byproduct mercury produced annually from cyanide based gold mining can be calculated to

be around 1120 tons. To put this number in perspective, the world’s three largest producers of primary mercury from active mercury mines -- Spain, Algeria, and Kyrgyzstan -- produced about 1000 tons combined in the year 2000.

Cyanide based gold mining is increasing; and, other types of mining besides gold also produce byproduct mercury, thus the numbers could very soon become much higher. Newmont is planning a dramatic expansion of the Yanacocha mine; gold production in the U.S. has increased ten-fold since 1980. If gold mining is not already the single largest point source of primary mercury in the world, then it certainly will be within a few years.

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Managing Byproduct Mercury

There is no easy solution to the question of how to deal with byproduct mercury. Certainly it is unacceptable to allow it to enter the biosphere as pollution. But full capture of the mercury by mines leads to far more mercury than is likely to be needed, as more and more mercury is phased-out of use in large-scale applications such as chlor-alkali production.

According to one EPA official, virtually all the byproduct mercury mined inside the U.S. is sold to developing countries. The combined effects of phased-out uses and increased byproduct mercury will lead to a



Trucks that carry byproduct mercury from the Yanacocha mine in Peru. Copyright Ernesto Cabellos

global glut, sending prices down with the result that unsustainable uses such as artisanal mining will become more attractive to poor laborers.

There is no doubt that oversupply, without the necessary global legislation banning mercury use and trade and requiring its safe containment, will lead to even more rapid rates of global contamination. On the other hand, it is feared that stringent controls over byproduct mercury might create incentives to emit more mercury into the air or in tailings.

Mercury as Toxic Waste

It is interesting to note that the Newmont Company, the largest gold mining company in the world and the company that owns the Yanacocha mine in Peru responsible for contaminating villagers at Choropampa with byproduct mercury, is among the first companies to be looking for ways to deal with its mercury beyond marketing it. In May of 2001 they announced that they were granted a license by the Brookhaven National Laboratory to utilize a Sulfur Polymer Stabilization/

Solidification process that converts mercury to mercuric sulfide, a compound that has low solubility, low vapor pressure and will pass stringent leachate tests. Apparently, Newmont already sees byproduct mercury is far more a corporate liability than a source of profit.

Increasingly, mercury more closely resembles a hazardous waste rather than a commodity, and should be managed as such globally. Such methods of stabilization along with safe, precautionary storage, will hopefully become the future of all byproduct and other mercury within the next ten years.

Why Mine Mercury Intentionally?

Perhaps the biggest question begged by the

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vast unintentional mercury production we now face, is why are we allowing any dedicated primary mercury mines to operate when unintentional sources are clearly capable of meeting dwindling demand? That is, in an era which is expected to see massive amounts of mercury be decommissioned; wide-scale recycling increasingly prevalent; and far less uses for mercury being environmentally acceptable -- how can there be any justification for continuing to subsidize and operate mines in Spain, Krygyzstan or Algeria?

The accident that occurred at Choropampa is the ugly tip of a mercury iceberg that cries out for international action. It represents an overlooked, looming and massive source of mercury on a planet that can ill afford another single drop of the toxic metal. It is critical that as a first step, a study be undertaken to quantify the amount of byproduct mercury being produced from gold and other metals mining worldwide. Then employ a global strategy to ensure that all governments require byproduct mercury to be fully recovered, stabilized, and safely retired.

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