ENVIRONMENTAL HEALTH COUNCIL

Soil Evaluation of the Exterior of the School Grounds of Educational Institution N° 86399 Juan Pablo II, Huallín, Chacas District, Asunción Province, Áncash Department, Peru

Sample Collection Date: July 8, 2024

Report of Results and Recommendations

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Report Date: October 25, 2025

The Environmental Health Council (EHC) is a U.S.-based nonprofit organization dedicated to identifying, evaluating, and remediating the effects of environmental toxins on affected communities. The EHC works through a combination of scientific assessment, collaboration with communities and authorities and advocacy to promote environmental and public health.

Within the framework of the Environmental Health Council's objectives, soil near the school grounds of Pre School N° 86399, "Juan Pablo II," and soil within the community of Huallín, in the district of Chacas, province of Asunción and Department of Áncash, Peru, was collected and analyzed.

The objectives of the technical evaluation were:

- To determine whether contamination from former mining operations involved in mineral processing and refining—from the colonial period to the present—have left heavy metal pollution, also known as "legacy contamination."
- To assess the levels of lead (Pb), mercury (Hg), and arsenic (As) in the soil that children attending, and staff working at, the school may be exposed to.
- To quantify the concentrations of these heavy metals and compare them with the Environmental Quality Standards (ECAs in Spanish) established in Supreme Decree No. 011-2017-MINAM for soils of residential/park use in Peru.
- To identify critical areas near the school that require attention, determine the potential health risk for the students and staff, and propose recommendations.

Four soil samples were collected from outdoor locations, mostly from adobe walls. The attached table presents the results of samples, and the attached figure presents the locations of the samples.

Soil samples were analyzed in the field using the Niton xl3t GOLDD+ model portable X-ray Fluorescence (XRF) spectrometer, with results expressed in parts per million (ppm), also the same as milligrams per kilogram (mg/kg), to evaluate the contaminants of interest.

The analysis focused on heavy metals and metalloids of greatest toxicological relevance typically associated with mining activities: Pb, Hg, and As. According to the ECAs for soil, the MPLs for residential/park use are:

- As: 50 mg/kg (ppm)
- Hg: 6.6 mg/kg (ppm)
- Pb: 140 mg/kg (ppm)

Four soil samples were collected within the community of Huallín in 2024. Pb was detected at 118 mg/kg and 249 mg/kg in samples HUAL-R-1 and HUAL-R-2, respectively. These samples were collected from earthen walls within the community. HUAL-R-2 was collected adjacent to the Juan Pablo II school grounds. The rest of the sample results were below applicable ECAs.

Areas of Concern

The results of sample HUAL-R-1 and HUAL-R-2 reveal contamination of the three heavy metals analyzed and suggests that there may be additional contamination nearby or elsewhere in the community.

- **Pb:** Although the value of 118 ppm is below the ECA of 140 ppm, it is important to note that it is at a level is likely above background levels and likely represents legacy mining impacts. The sample location of HUAL-R-2 is within several meters of the Juan Pablo II school grounds Additional assessment of the school grounds and community is warranted.
- **As:** The concentration of 64 ppm is above the ECA of 50 ppm in HUAL-R-2, representing a risk. This level of As may represent legacy mining impacts.
- **Hg:** Mercury was detected above the ECA of 6.6 ppm in HUAL-R-1 at 8 ppm. This sample was collected from an adobe wall in the center of town. Mercury was not detected at or above the detection limit of approximately 5 ppm, in the rest of the samples, which is a positive finding.

It is important to highlight that this evaluation is based on four samples. To obtain a representative picture of soil quality across the school, a broader assessment covering different areas of the school, such as play area, gardens, and entrances is warranted. In addition, assessment of soil contamination in the broader community is also warranted.

Conclusions and Recommendations

1. The sample HUAL-R-3 adjacent to the eastern lateral perimeter of Educational Institution N° 86399 **exceeds** the ECAs established in Supreme Decree 011-2017-MINAM for arsenic and lead.

2. Given the elevated arsenic and lead level, other areas of the school and other areas of the community should be evaluated due to the limited sampling.

Attachments:

Table of Soil Results
Sample Location Figure

Soil Sample Results
Huallin, Ancash 2024

Sample ID	Sample Location	As (ppm)	Hg (ppm)	Pb (ppm)
HUAL-R-1	Muestra de pared de tapial	41	8	118
HUAL-R-2	Muestra de pared de adobe	64	ND	249
HUAL-R-4		17	ND	73
ECA		50	6.6	140

Note:
ppm - parts per million or milligrams per kilogram (mg/kg)
ECA - Environmental Quality Standard per MINAM, Supreme Decree No. 011-2017
ND - Not detected
Red shaded cells indicate that the sample result is above the respective ECA

Soil Sample Locations, Huallin

10/25/2025

Peru Colonial Site Assessment

World Imagery

Low Resolution 15m Imagery

Citations

1.2m Resolution Metadata

1:3,600

0 0.03 0.06 0.12 mi

0 0.05 0.1 0.19 km

Vantor

The EHC