



**Project Completion Report:
Used Lead Acid Battery Site Remediation**



Project Details:

Location	Haina, Dominican Republic
Contaminant	Highly Concentrated Lead in the Soil
Project Duration	March 2007—March 2010
Project Cost	\$268,000 total. \$148,00 from IDB, \$86,000 from Blacksmith; \$34,000 from Other Sources
Implementing Partners	Ministry of Environment in the Dominican Republic; Inter-American Development Bank; University of San Domingo; TerraGraphics Environmental Engineering, Inc; Hunter College.

Performance Metrics:

Toxin	Lead
Affected Population	90,000
Exposure Standards	400 ppm (EPA) soil lead levels
Levels Prior to Project	Up to 463,970 ppm. Average site over 5,000 ppm
Levels Following Completion	300 ppm and lower (clean fill). Blood lead level monitoring shows steady reductions

- **Background and Scope:**

Bajos de Haina has been referred to as the “Dominican Chernobyl”. The community is very near an abandoned lead smelter, and nearly its entire population shows signs of lead poisoning. In 2000, the Dominican Secretary of Environmental and Natural Resources identified Haina as a national point of significant concern. According to the UN, the population carries indications of lead poisoning. Over 90% of Haina’s residents were found to have elevated blood lead levels.

Paraiso de Dios is a community located in the municipality of Haina, 7 kilometers due west from the capital, Santo Domingo and just west of the bridge crossing the Haina River. The former Metaloxsa (Metales y Oxido, S.A.) Lead-Acid Battery Recycling facility occupies approximately a 45-hectare site, located on the top of a hill with a view of the Rio Haina, which is about 300 meters to the south and drains directly into the Bay of Haina another 0.7 km downstream. Three sides of the site are bordered by homes with dirt floors. Paraiso de Dios is very hilly and rainwater runoff from this site travels east and south through a highly populated residential neighborhood to the Rio Haina and then to the Bay of Haina. Lead levels in soils throughout the community exceeded USEPA limits for lead by over 10,000 times, some reaching 50% lead content.

- **Solution Implemented:**

Terragraphics Environmental Engineering, in partnership with Blacksmith Institute, designed an intervention for the site with an approximate timeline of two years. In 2007, Blacksmith led the formation of a stakeholder group, meetings with possible funders, and community outreach and education. The stakeholder group consisted of the Ministry of the Environment and Natural Resources, the Autonomous University of Santo Domingo, Metaloxsa, and the community, among others, and met regularly to discuss project progress and build consensus on appropriate intervention and remediation activities. In the first year, Blacksmith held community education days encouraging community members to adopt appropriate safeguards to mitigate their lead exposure and conducted ongoing blood testing.



- **Project Performance:**

Excavation of the site occurred from December 2008 through February 2009. Over 6000 cubic meters of principal threat materials were removed from the community and transported to an industrial site for storage in an environmentally sound, monitored pit adjacent to another lead smelter for processing. In conjunction with the Ministry of Environment, local crews and contractors were hired and trained, building capacity within the Dominican Republic to perform a hazardous waste removal operation – the first of its kind of the country. In addition to removing waste from the formal industrial site, community walkways and backyards were also excavated and backfilled with clean sand and soil. The main pit where a majority of the waste was stored became a public park in late 2009.

In mid 2010, a second round of soil excavations was conducted of contaminated houses and streets surrounding the main site. Another 4000 cubic meters of soils with elevated lead levels were removed and disposed of safely, under the supervision of Terragraphics. A number of backyards were concreted.

Blacksmith continues to monitor the blood lead levels of the children in the community.

- **Outcomes and Follow Up:**

Blacksmith Institute, along with its partner organizations, was able to successfully remove the sources of environmental pollution in Haina. Not only was a physical remediation of the polluted soil a success, crews of local laborers were heavily involved throughout the process, laying the groundwork for a sustainable solution.

Additionally, by educating the public about the dangers of lead pollution and ULAB recycling, the possibility of recurrence of lead pollution at a similar scale appears highly unlikely.