



**Project Completion Report**  
**Used Lead Acid Battery Recycling**



**Project Details:**

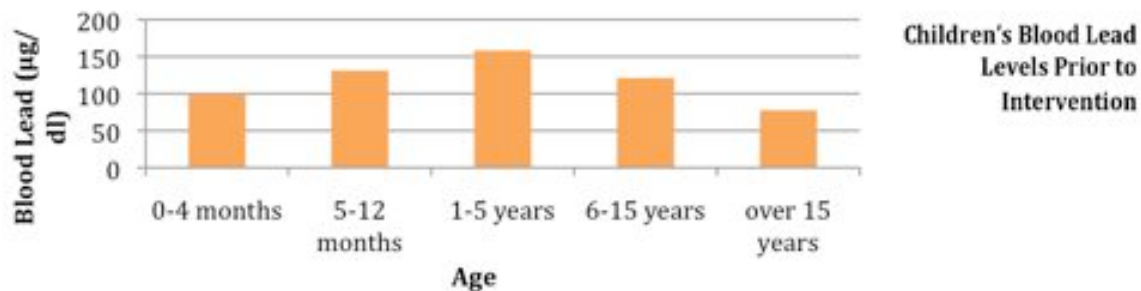
Location	Thiaroye Sur Mer, Senegal
Contaminant	Used Lead Acid Batteries
Project Duration	March 2008—present
Project Cost	\$250,000+
Implementing Partners	Senegalese Government, University of Dakar, World Health Organization, Blacksmith Institute, Terragraphics, Quality Environmental, Hunter College of New York, and others

**Performance Metrics:**

Toxin	Lead
Affected Population	40,000
Exposure Standards	10 µg/dl
Levels Prior to Project	As high as 150 µg/dl, and at least 18 confirmed deaths
Levels at Present	Up to 50 µg/dl, and reducing quickly

- **Background and Scope:**

In March 2008, Blacksmith Institute was contacted about the death of 18 children under age five in the neighborhood of Thiaroye-Sur-Mer in Dakar. These children all died from acute lead poisoning due to constant exposure to lead dust in the air, soil and water. The source of lead exposure was quickly determined to be the informal recycling and disposal of used lead acid batteries from cars (ULAB). This practice was a popular way to supplement domestic income, and was typically undertaken by the women in Thiaroye-Sur-Mer. Because this activity was taking place in an informal, domestic setting, the practice was totally unregulated, often in open-air settings, exposing some 40,000 people to lead dust. Upon learning of the death of the 18 children in Thiaroye-Sur-Mer, the Senegalese government worked to shut down these illegal lead battery-smelting operations. Blacksmith tested 41 children's blood lead levels upon their arrival—100% of the children tested presented levels over 10  $\mu\text{g}/\text{dl}$ , the highest being over 150  $\mu\text{g}/\text{dl}$ . The World Health Organization states that any child testing over 70  $\mu\text{g}/\text{dl}$  is cause for the declaration of a medical emergency.



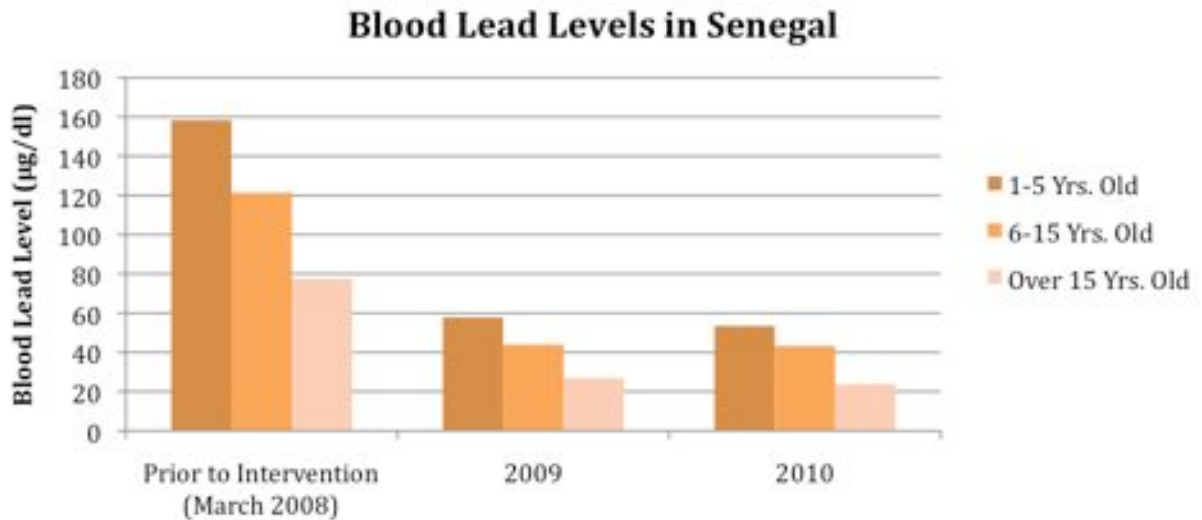
- **Solution Implemented:**

This project has engaged Blacksmith Institute, the Senegalese government, the University of Dakar's Toxicology department, as well as the Senegalese Ministry of Health. The latter two partners have developed an educational program in conjunction with local religious and village authorities to convey the dangers and potential persistence of exposure to lead dust. On a medical level, the World Health Organization has already committed to treating those who have already been exposed, and the local government has initiated remediation efforts to treat the soil and immediate outlying environment with funding from Blacksmith Institute and others. Policy changes are also in effect, targeted toward eliminating the market for informal ULAB recycling by better regulating collection, transportation, storage, and recycling practices. The Senegalese Department of Women's Affairs is also working toward developing alternate sources of income, helping to reduce the economic incentive to turn toward informal ULAB recycling in the first place.

- **Project Performance:**

Following the joint intervention by Blacksmith Institute and its local partners, the contaminated area has now been cleaned up. Soil levels are now below 400 ppm (versus levels in excess of 400,000 ppm in some places). While children between ages of 1 and 5 years old were presenting blood lead levels in excess of 150  $\mu\text{g}/\text{dl}$  in early 2008, the average blood lead level in that age group is now down to 53.457  $\mu\text{g}/\text{dl}$ .

Similar decreases were seen across other age groups, pointing to an overall downward trend in blood lead levels across the board, a massive achievement in a community that was previously in imminent danger of experiencing lead poisoning on an epidemic level.



#### ○ **Outcomes and Follow Up:**

The final phase of clean-up is now complete, and ongoing work includes monitoring children's blood levels, which continue to drop as expected. In addition, a new collection center for lead batteries has been constructed, and is now being used to manage batteries in a safe manner.

Soil clean-up included the physical removal of over 2,500 cubic meters of Principal Threat Materials by local contractors and Blacksmith local partners, the decontamination of more than 80 homes by local women, trained and guided by Blacksmith Technical Advisory Board members, and the initiation of educational programs that mitigate further ULAB pollution and lead exposure.