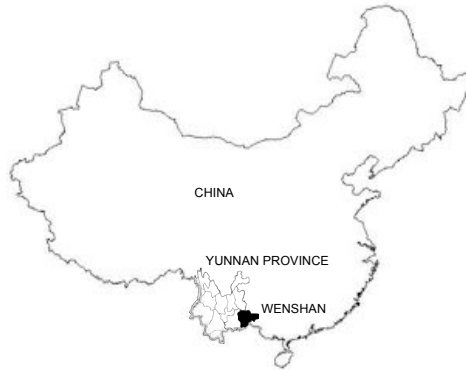




**Project Completion Report:
Wenshan Arsenic Mining Remediation**



Project Details:

Location	Wenshan County, Yunnan Province, China
Contaminant	Arsenic in the Water Supply
Project Duration	May 2007—June 2009
Project Cost	\$120,000 (incl. \$80,000 contributed from the local government)
Implementing Partners	Yunnan Environmental Protection Bureau (EPB); Wenshan County; Millipede Foundation of Hong Kong

Performance Metrics:

Toxin	Arsenic
Affected Population	8,600
Exposure Standards	0.05 mg/L
Levels Prior to Project	1.07 mg/L
Levels Following Completion	0.04 mg/L

- **Background and Scope:**

This project was initiated in late 2006 in collaboration between Blacksmith Institute and the Yunnan Environmental Protection Bureau. The key problem identified was the contamination of local water supplies, high in the headwaters of several major river systems, a result of small abandoned metal mines and processing facilities. The local pollution problems are severe, and because heavy metals do not degrade in the environment, erosion of these materials adds to the cumulative pollution load on the river system. The objective was to develop practical approaches for a typical case in collaboration with the Yunnan and local EPBs, which would serve as a model for other mountain villages with similar problems. The project was structured to provide direction and momentum for a wider effort by the Province to address mining pollution and water contamination challenges.

The primary focus of this work was to protect public health, as these sites discharge toxic metal contamination into local waterways that are sources of drinking water for local populations.

- **Solution Implemented:**

In May 2007, a technical team from Blacksmith, together with officials from Yunnan EPB and from local governments, made visits to the three mine areas in the mountains. Engineers and technical staff from the different level governments joined the visiting specialists for the visits. A detailed report was prepared covering a number of sites in the three mining counties and it was agreed that the pilot remediation would be implemented at one particular site, known as Wenshan no.4. The major works implemented were a retaining wall to create a stable tailings storage area, together with the installation of an impermeable lining to the area. The dumped arsenic residues were then moved to this secure area and placed in compacted layers to ensure stability. The surface of the completed storage area was vegetated, using local species suited to the conditions, and drainage ditches were installed along the sides of the final storage area to divert away the surface water flows. Controls to access were also put in place to prevent unauthorized access and to deter scavenging of remaining structures.

- **Project Performance:**

Surface water drainage samples were taken by Wenshan County EPB, at the request of Blacksmith, to provide a baseline level against which the post-remediation contamination could be compared. The reported arsenic concentration in the drainage from the site before the works was 1.07mg/L, which was more than twenty times above the limit (0.05mg/L). The arsenic content in the drainage systems after remediation was 0.048mg/L, according to tests by the local EPB, and therefore is now just within the limits. The authorities are planning a program of sampling during the rainy season, which will provide a better picture of the success of the works in containing the contamination and reducing off site transport.

- **Outcomes and Follow Up:**

The success of the pilot project has been recognized by the authorities in Yunnan and has reinforced the value of the approaches and the potential for developing the broader program. A large part of the success of the pilot is due to the commitment and efforts of the Wenshan County Government, with the backing of Wenshan Prefecture and the Province. According to the Wenshan County EPB, there are at least five old smelters in the county that need to be addressed, and there is an estimated one million tons of polluted material that needs to be controlled. Wenshan Prefecture is preparing a comprehensive plan to address related issues in all the affected counties. The new national policy on environment protection in rural areas provides a favorable context to move ahead on remediation efforts. Blacksmith and the Yunnan EPB are continuing the dialogue with Wenshan Prefecture and County about possible ways to provide technical and financial support to the remediation efforts. The team will also follow up with the Provincial authorities on the lessons learned from the project work and how these lessons could be applied more broadly.



