BLACKSMITH INSTITUTE

Project Completion Report:
Groundwater Pollution in Pyra

- **Project Details:**

Location:	Piri, near Dzerzhinsk; Nizhnii Novgorod region, Russia
Contaminant:	Heavy metals, arsenic, and others
Project Duration:	April 1, 2006 – March 31, 2007
Project Cost:	$15,000
Implementing Partners	Committee of wildlife management
Other Partners:	Ecological center “DRONT”

- **Background and Scope:**

A once-secret manufacturing center of the Soviet Union's defense industry located 450 kilometers southeast of Moscow, Dzerzhinsk (population 300,000) has hosted many chemical factories, including production facilities for Sarin and VX nerve gas. Lead additives for gasoline, mustard gas, munitions, and other highly-polluting products can also claim this city as their birthplace. While many of these factories are now closed, the chemical industry still employs over a quarter of local residents. The groundwater and soil around the city, about 250 miles east of Moscow, remain severely polluted with phenol, arsenic, dioxins, heavy metals, and a host of other toxins. Indeed, a dominant ecological landmark in the area is the “White Sea”, a 100-acre-wide lake of toxic sludge discharged from nearby factories.

Clearly, Dzerzhinsk faces huge challenges in managing this legacy of toxic wastes. It holds the ignominious title of "The Most Chemically Polluted Town" in the world. Greenpeace claims that the average life expectancy of city residents may have shrunk to a mere 45 years. The city's annual death rate, 17 per 1,000 people, is much higher than Russia's national average of 14 per 1,000. And, according to researchers at the Nizhny Novgorod Research Institute of Hygiene and Occupational Pathology, rates of reproductive health disturbances affecting women and fetuses, as well as rates of respiratory and pulmonary diseases in children, are dangerously high. In study after study, the health impacts of these chemicals continue to dampen enthusiasm and drain resources needed for economic and social recovery in Dzerzhinsk.

While there are many pollution-related issues that cry out for investment and remediation in the city, water quality is of paramount importance. The Dzerzhinsk Committee of Environmental Control, a local government agency dedicated to finding solutions for pollution-related problems, has highlighted the degree to which the quality of drinking water in some residential areas of the city, damaged by years of discharge of as many as 150 separate toxic chemicals, does not come close to meeting safety standards. Despite this assessment, the city still draws its drinking water from the same aquifers abused by toxic wastes and unused products over many years.

One area of particular concern is the residential sector of Piri (population 4,000) where groundwater is also used as a major source of drinking water. The town is surrounded by swamps and the old local water treatment facility does not provide even an adequate level of groundwater cleanup. Drinking water tested was found to have ferrous-organic and fecal bacteria levels well above accepted safety standards. Compounding these problems, the aquifers that supply Piri also feed into groundwater that affects larger population centers as far away as St. Petersburg.

- **Project Metrics and Results:**

  Following the support of a baseline research project in the area in 2004, Blacksmith, in cooperation with the local government funded the installation of a water treatment system in Pyra (population 4,000), a settlement whose groundwater is highly polluted, yet remains the sole source of drinking water. In addition, Blacksmith has also funded the establishment of a steering committee led by a local NGO (DRONT) in cooperation with the Nizhniy Novgorod municipal government, to begin the design of a large-scale remediation and pollution mitigation plan for the entire affected area.

  Implementation Strategy:

  1. The Dzerzhinsk Committee of Environmental Control led work of project team.

  2. Testing was conducted by the following laboratories:

     - Laboratory of Environmental Monitoring, Dzerzhinsk Branch, Russian State Hydrometeorological Committee
     - Volgageologia's laboratory
     - Laboratory of the Sanitary-Epidemiological Surveillance, City of Dzerzhinsk

  3. For quality control purposes, a subset of split samples was analyzed by the State Laboratory, Russian State Hydrometeorological Committee (City of Obninsk, Moscow region) and by the Laboratory of Ecotoxicology, Institute of Ecology and Evolution (Moscow). These two laboratories had participated in the Russian-American project on lead risk reduction and demonstrated adequate reproducibility of analytical results (Ref).

  4. In addition, for quality assurance purposes and for building capacities for environmental monitoring in Russia, all laboratories included in the proposed project were enrolled in the US EPA's inter-laboratory calibration program for heavy metal analysis entitled Environmental Lead Proficiency Accreditation Testing (ELPAT).

- **Outcomes and Follow-up:**

  Blacksmith Institute is working, village by village, to restore safe water to city residents. In Spring 2005, Blacksmith completed the construction of a water filtration system in Pyra village, ensuring safe water for village residents, the local hospital, and a school. Blacksmith has also funded the establishment of a steering committee led by a local NGO (DRONT), in cooperation with the Nizhniy Novgorod municipal government, to begin the design of a large-scale remediation and pollution mitigation plan for the entire affected area.

- **Pictures:**


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