Environmental Issues related to Primary Mercury Mining in KYRGYZSTAN

Technical Assessment 2009

Technical Assessment on Environmental Issues related to Primary Mercury Mining in KYRGYZSTAN

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Mercury production at Khaidarkan

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DISCLAIMER: Robust and reliable technical and environmental data being difficult to obtain on past and current mercury mining operations in Kyrgyzstan, the assessment report has used data from various sources and in some instances the data is incomplete. Any views expressed in the document do not necessarily reflect the views of UNEP.

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Executive summary

Project background

This report is part of the overall Kyrgyzstan Primary Mercury Mining Project funded by the Government of Norway, Switzerland and the United States of America and being carried out as a partnership between UNITAR, UNEP, and Zoï Environment Network.

Reducing the supply of mercury has been identified as a priority area by the United Nations Environment Programme (UNEP) Governing Council, which considers primary mercury mining as an important activity to be addressed in order to reduce global loadings of mercury to the environment in the future. It is considered highly likely there will be global controls in place on mercury within a 10 year time frame.

Kyrgyzstan is the last remaining major supplier of primary mined mercury to the international marketplace. This project was initiated to assist Kyrgyzstan to address the possible phasing out of mercury production at the Khaidarkan Mercury Mine. As part of the overall project, a feasibility study is being undertaken aimed to facilitate, with further support from a planned consortium of donors (including the US, GEF, World Bank, Asia Development Bank and others), the eventual cessation of mercury mining activities in an environmentally and socially sound manner.

The main findings of the Technical Assessment address two priority areas: i) environmental impact of past and current mercury production and ii) the technical conditions and the economic viability of mercury production and possible industrial alternatives.

Environmental impact

Based on expert interviews, field research and a screening sampling campaign, the assessment concludes that the area around Khaidarkan plant, comprising Khaidarkan town and adjacent agricultural land as well as natural waterways is characterized by elevated mercury concentrations. The mercury levels in agricultural soils, river sediments, shaft water sediments and ambient air frequently exceed the national environmental standards of Kyrgyzstan. Due to technical limitations, chemical forms of mercury could not be specified.

There are very limited environmental protection measures in place, while instrumental monitoring and quality of environmental reporting is inadequate in view of the identified and potential hazards.

Technical equipment at the site islargely outdated and requires maintenance. Relevant emission sources comprise:

- Mercury smelter; in particular emissions from the rotary kilns, stack emissions (pollutant concentrations essentially vary depending on smelter operation and weather conditions) and process water from the mercury precipitation process.

- Slag heaps and sludge sedimentation ponds; wind and water erosion of mercury-rich material and uncontrolled accessibility.
- Tailing ponds; wind and water erosion, dust formation (especially in warm and dry seasons), water seepage and uncontrolled accessibility.

Re-volatilization of mercury deposited in the natural environment also contributes to elevated mercury levels in ambient air and river sediments. Even if mercury production stops in the area, this source for pollution will remain.

A limited number of studies suggest that in the past there were likely impacts on human health resulting from mercury production in the Khaidarkan area. Recent data indicate that in particular the immune systems of children appear to be weakened by the elevated levels of mercury in the environment. Some categories of workers are exposed to elevated occupational health risks.

Mercury production

Production levels at Khaidarkan plant seem to decline due to depletion of mercury ores in the developed areas and attenuation of primary mercury production is considered imminent by the mine management as stated in the Khaidarkan Business Plant for Cement Production (2005). It is estimated that explored reserves of mercury will be sufficient for approximately five to sevenyears of operation. In 2007, almost 50 per cent of the mercury produced in Khaidarkan originated from secondary sources such as chlor-alkali wastes imported from Russia. The company foresaw continuation of this practice to stabilise mercury production which has been hampered by technical difficulties but no new contracts for mercury-rich waste materials import were concluded in 2008 which is reflected in the lower production figures compared to 2007. Other products of the mine are fluorspar and antimony concentrates. The production cost of fluorspar concentrate is twice the market value of the product. In the past, profitable mercury sales balanced out the negative income from such activities. Since the company created a deficit in 2008, it was decided to cease this operation and to focus on exploratory works to strengthen the mercury and antimony business.

Mining since independence has been largely based on exploratory work done during the Soviet era when large resources were allocated to geological survey. Even though it is known that significant mercury reserves are located at greater depths or at abandoned mining sites, the capital investment required to make these resources available is limiting their exploitation. In 2009 the Khaidarkan plant requested 20 million soms (about US$0.5 million) from the Government for geological survey and other development needs.

In June 2009, a major failure in the pumping system at the main mercury producing shaft of Khaidarkan occurred, which reportedly led to the flooding of several lower levels of the shaft and suspension of mining operations there. Due to lack of funds, the plant management declared that it cannot fix the problem and appealed to the governmental support.

Mercury export

The destinations for and applications of mercury produced in Khaidarkan remain unclear: a number of export countries and trading pathways have been discussed, but none could be officially confirmed. Kyrgyz representatives at the National Forum on the Action Plan to adress Primary Mercury Mining and its Impact on Environment held in July 2009 in Bishkek indicated that China is the major export destination of Khaidarkan's mercury. The Kyrgyz Ministry of Industry, Energy and Fuel Resources and the Khaidarkan management report that in 2007-8, around 80-90 per cent of mercury products were purchased by foreign firms and 10-20 per cent by CIS countries (Russia, Azerbaijan). Local experts indicated that a small fraction of the mercury remains in Kyrgyzstan where it is used for artisanal gold mining, predominantly in central and southern regions.

Economic conditions of Khaidarkan plant

Due to high operational cost, technical difficulties, constraints in feedstock supply and lack of professional staff, the company results have been struggling over the past years. In particular the high cost for energy (electricity and gas) which amount to about 45-50 million som (approximately US$ 1 million) per year, make up 30 to 50 per cent of the total operational cost. It has been stated by various company and government representatives that the mine is self-sustaining and no subsidies are given. However, the department on regulation of the fuel and energy complex at the Ministry of industry sets the preferential tariffs for electricity consumed at Khaidarkan (natural gas has no benefits). According to the mine, the company pays 1 som (about US$0.3) per 1 kWh. The reduced tariff is 30 per cent lower compared to common prices for industrial consumption. It is explained that this kind of subsidized price is applied because Khaidarkan supplies pumped water for the local community used of irrigation and households (non-industrial electricity consumption). Reported liabilities consist for a large part of energy debts that reportedly have caused recent rumours about the plant being pledged to foreign companies.

Local conditions

The Khaidarkan mine is still strongly supported by the general public in the area and by institutions unconnected with the environment. However, the effects of the economic crisis, recent cash flow problems as well as technical difficulties surfacing over the past months appear to open up possibilities for discussing alternative development strategies.

The number of employees has decreased recently. In 2007, 865 people were directly employed by the mine, including about 100 management personell. The number went down to about 750 people in 2008.

The mine has indicated that one of the handicaps in maintaining stable production is the lack of professional staff. Most skilled and experienced workers have left or migrated to other districts of Kyrgyzstan or CIS countries where higher salaries can be obtained.

Economic alternatives

Industrial opportunities for economic diversification comprise gold mining, cement production, construction industry, bauxite mining and aluminium production, bentonite extraction and production of fire resistant bricks. Each of these options requires thorough analysis before clear recommendations can be made but it has been concluded that it will be advantageous for the local community to build on existing capacities such as raw material extraction and/or processing.

On the other hand, at the same time food and textile industries as well as service sectors are gaining strength in the Batken province, which provide broader opportunities for alternatives.

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