

**State Agency on Environment and Forestry under the Government
of the Kyrgyz Republic**

PROJECT

**SOCIAL AND ECONOMIC INVESTIGATION OF
PRIMARY MERCURY PRODUCTION AT THE
KHAIDARKAN MERCURY PLANT**

(Version #1)

PREPARED WITH ASSISTANCE OF UNITAR

Bishkek 2009

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1. Introduction

Kyrgyzstan abounds with high-grade mercury deposits. Under some appraisal at least two of them contain more than 40 thousand tons of mercury. The greatest one is Khaidarkan. As of today Kyrgyzstan is almost the only producer of primary mercury in the world after the Almaden in Spain was closed in year 2004.

Besides another two deposits are situated in Southern Kyrgyzstan which used to cooperate with Khaidarkan mercury plant (KMP). However unlike KMP these shafts stopped functioning at the beginning of the 90th. Neither environmental rehabilitation nor environmental monitoring of the contaminate sites has been performed so far yet.

Economy of Osh province is mainly of agrarian type, whereas main industrial enterprises (including mercury and antimony production, as well as coal production) are located in Batken province. Thus the subject of present project is investigation of the problems which are specific to Batken province.

The Khaidarkan mercury plant is the operating city-forming enterprise of great importance for the region where it is situated. Its staff numbers more than 600 employees. More than 20 thousand people, residing in this region, depend on operation of the plant.

In the course of investigation the analysis of economic state of the Khaidarkan mercury plant was implemented as well as inquiry of its employees and inhabitants of Birlic ail-okmotu and Aidarken settlement, situated close to the plant.

Additionally to the economic analysis the investigation was aimed at gathering some social information with regard to public, group and individual concerning facts, events, appraisals of their vital activity and of possible changes in consequence of KMP's operational activity.

The main target group of the investigation includes adult residents of Aidarken settlement and some villages, located in the impact area of the Khaidarkan mercury plant.

The control target group is represented by residents of the settlements located outside the impact area of KMP. Mixed methodology was used. The main questions of the questionnaire were aimed at gathering information regarding the content of the phenomenon investigated.

It was revealed that the plant is of great importance for the respondents. The evidence of this consideration is that when answering the question "Is the Khaidarkan mercury plant of benefit to you?" 94.4% of the residents replied "yes", 2.8% replied "no" and 2.8% did not reply at all though they didn't possess any sufficient information about the plant and didn't obtain any assistance from its side. Answering the same question 80.6% of the plant's staff replied answered "yes" and 9.7% replied "no" and 9.7 % did not reply at all. The quota sampling was applied within the investigation. Not substantial but closely correlative characters were used. Representative sample was formed theoretically.

During the investigation four ages groups were polled: 16–25, 26–35, 36–55 and from 55 years old and elder. Besides, the respondents were divided according to such features as gender, marital status, education, place of residence, family income and etc.

The main conclusion of the Preliminary estimate is following. The Khaidarkan mercury plant continues its operation, in spite of serious technical difficulties and continuous discussions

regarding its environmental impact. The administration of the Khaidarkan plant intends to expand its mercury production.

As mentioned above, KMP enjoys wide support among the local community and some organizations unrelated to environmental protection. It is caused by a role of the plant in the national economy. KMP is a significant taxpayer at the national level. Besides it is the largest employer in Aidarken settlement. It is also connected with the fact that water and energy supply and gas hitting for some part of the inhabitants residing near the plant is provided via the services of the plant.

Electricity costs incurred by the plant amount 25% of total costs. Reduced electricity tariffs allowed to the plant by the State department for control of fuel and energy complex under the Ministry of industry are insufficient measure in the judgment of the majority of the staff. Meanwhile the enterprise doesn't enjoy any reduced tariffs for natural gas. According to the questionnaire results the majority of the staff believes that the plant fails to solve such existent difficulties on its own and they expect assistance from the government's side.

According to expectations of the plant's administration explored but unopened reserves of monometallic mercury ores and complex mercury-antimony-fluorite ores will be enough for 10-12 years of breakeven and stable operational process of the enterprise. The plant independently concludes agreements with consumers and establishes the prices in the negotiation process without any assistance from the government authorities.

There are various signs of the fact that mercury pollution persists essentially impacting on human health and environment. Particularly there are some apprehensions with regard to pollution of agricultural lands and wastewater. Besides, another risk factor consists in accessibility of slag disposal sites for the residential population and for the cattle as well. Answering the question "Is an activity of the Khaidarkan mercury plant harmful?" 84.5% of Khaidarkan residents replied "yes", 2.8% replied "no" and 12.7 didn't reply at all. Answering the same question 67.6% of the plant's staff replied "yes" and 32.3% replied "no". In spite of the negative impact of KMP on human health and environment that is considered by some respondents the attitude towards the plant remains positive. This is caused both by historically established public image and a soviet enterprise or habitualness of existence in such conditions. Approximately 70% of respondents (basically the elder age group) used to estimate the plant's operational activity rather useful in the past. Younger generation basically relies on themselves. It is proved by the fact that when addressing the question "what will you do if the plant closes down" such reply as "I will go away" was basically received among the youth. Moreover the family budget of 70% of respondents forms owing to their children working abroad in Russia and Kazakhstan.

In general no negative attitude with respect to the Khaidarkan mercury plant can be revealed among the community of the settlement itself. This might be caused by the reason that the inhabitants are used to living nearby the plant as stated above and that the settlement's infrastructure is closely associated with the plant's activity. Being asked the question "What do you gain from KMP?" the residents who do not have any relatives and close friends among the plant's staff were not able to reply. The main answer was "KMP provides a lot of people with job".

97.2% of residents get the information about KMP's operational activity from their relatives, neighbors and friends. The reasons of such situation are clear: they are the problems that the plant experiences and lack of public work with inhabitants. It is noteworthy that the number of plant's employees amounts a bit more than 600 people and population size of Aidarken settlement makes up 10 938 people. Another side of plant's economical influence on

people's life consists in a problem of functioning of the social services that used to be on the enterprise's balance but don't serve the population any more.

2. History and brief review of the Khaidarkan mercury plant's activity.

Flourishing of mercury mining industry fell on the VIII and XII centuries. Almost all of the known mining areas were discovered following the traces of ancient shafts. There are large-scale deposits of mercury in Kyrgyzstan the largest of which have been developed by the Khaidarkan mercury plant since year 1941. According to some appraisals two of these deposits (Chonkoy (Ulugtau shaft) and Khaidarkan) contain more than 40 thousand tons of mercury, up to 20 thousand tons each. It means that Kyrgyzstan still is a place of significant availability of mercury resources. After closure of Almaden shaft in Spain in year 2004 Kyrgyzstan is considered to be the world leader of mercury production.

The main consumer of metallic mercury is military-industrial establishment; the secondary consumers are electrical, chemical-engineering and other industries.

During the full operating cycle (mining – processing – commercial-grade mercury producing) the Khaidarkan mercury plant involves the following objects: open-cast mine, two underground mines (on mining mercury ores and on mining and processing complex ores such as antimony and fluorite), concentration plant on antimony and fluorite concentrate working, mercury metallurgical plant. Mercury ores and flotation sulphide concentrate are processed at the metallurgical plant that is a separate production unit with auxiliary shops and tailing dump.

By present time the Khaidarkan mercury plant has been reorganized into the Khaidarkan state mercury joint stock company and currently performs mining of monometallic (mercury) and complex (mercury-antimony-fluorite) ores from only Khaidarkan deposit. The principal product of KMP is metallic mercury and its compounds as well as antimony and fluorspar concentrate.

During the concentration process of complex ores the mill tailings (sandstone) are formed at the concentration plant. Concentration plant tailing facilities have been operated since year 1967. The tailing sludge is transported from the factory to the tailing dump along a special sludge pipeline of 5500 m length. Diameter of the main sludge pipeline is 219 mm. Length of the distributive sludge pipeline is 1200 m.

The mill tailings are stored in a specially equipped tailing dump made under the project of the institute "Kazmehaobr" (Almaty).

During its active production period the plant annually emitted up to 13.22 tons of metallic mercury, 315.9 tons of dust, 295.3 tons of carbon monoxide and 45.02 tons of sulphur dioxide to the atmosphere. Emission of production wastes is performed through a smoke stack at an altitude of 1980 m above sea level¹. Production statistics of the Khaidarkan mercury JSC (Appendix 1).

Power consumption

Khaidarkan mercury JSC obtains electric energy directly through high-voltage OHL-35 kV including up to 40% from power supply network of the distributive company OJSC "Oshelectro" that services Aidarken settlement. Further electric energy distribution is implemented within the enterprise by means of its own step-down substations 35/6 kV. All costs

¹ The project "Risk assessment at the Kadamzhai Antimony Plant OJSC and the Khaidarkan Mercury JSC

of maintenance, repair and leakages are incurred directly by the enterprise². Average annual electricity consumption by KMJSC amounts 46 million kilowatt-hour. Average annual natural gas consumption amounts 3000 cubic meters. Installed capacity of kilns amount P=2962 kilowatts. The power supply organizations servicing KMJSC are OJSC “Power plants of Kyrgyzstan” and OJSC “National electrical grid of Kyrgyzstan”. Average annual power costs of KMJSC are 43.3 million soms that is 25% from total costs. The main energy consumers are water pumping stations, compressor house, metallurgical plant, concentration plant.

Investments required for continuation of mining

At present the Khaidarkan mercury JSC develops mercury-antimony-fluorite deposit “Novoye” that contains 5469 tons of mercury, 46880 tons of antimony and 447 tons of fluorite. Because of deficient financial resources the enterprise doesn’t have any possibility to prepare bottom lift ore reserves to developing. The sum of investments that is required for execution of such works amounts 3.0 million USD per year. Financial assets invested in maintenance and development of the plant will be directed to constructing of a pump station of 3000 cubic meters volume and to upgrading of concentration and transport facilities. For the purpose of production process regulation and further development of the plant as well for completion of “PESAC” program searching for a strategic investor is being carried out. Approximate volume of required investments makes up 6.0 million USD.

Within the program “PESAC” SJSC “Khaidarkan mercury plant” is considered to be an economic entity entered in the State register of natural monopoly entities and allowed monopolies dominated in the market.³

For the purpose of supplementary exploration and preparation to the reserves excavation the enterprise is to implement about 21.3 thousand running meters of mine workings and to drill 60 thousand running meters of exploratory wells. Total cost of preliminary works including the charges for purchasing of required mining equipment makes up about 4.0 million USD. Execution of preliminary works within this scale will allow providing the implementation of scheduled work of the mine #2 and concentration plant for a period of more than 10 years.

In May 2007 the enterprise was visited by a delegation of Russian and Chinese experts interested in developing of bauxite and nepheline syenite ores in Batken province. Expected reserves of these ores amount more than 4 milliard tons. Therewith the possibilities of detailed exploration and development of these ore deposits were examined.⁴

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