

# Gold Mining Industry of the Magadan Oblast in the Context of Sanctions: Threats and Consequences for the Region<sup>1</sup>

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**Abstract.** The introduction of another package of sanctions in connection with the start of a military operation in Ukraine especially changes the operating conditions in industries focused on the foreign market, both at the production stage and at the stage of product sale. Such industries include the gold mining industry, which uses high-performance foreign equipment for production and sells gold on the world market. The factors complicating the work of the industry at the current stage and leading to an increase in the cost of production and a decrease in the price of gold sales were considered: the application of sanctions to the largest partner banks of subsoil users, the ban by foreign countries on the purchase of Russian gold and on the import of imported equipment and spare parts, the depreciation of the dollar of the Central Bank of Russia. Using the example of a specific gold mining enterprise in the Magadan Region, an assessment was made of the efficiency of placer gold mining in the conditions that have changed. Federal and regional measures have been proposed to smooth out the severity of problems in the industry and the consequences for the economy of the monoresource northern region.

**Keywords:** *gold mining; economic sanctions; efficiency of alluvial gold mining; monoresource economy; Magadan region*

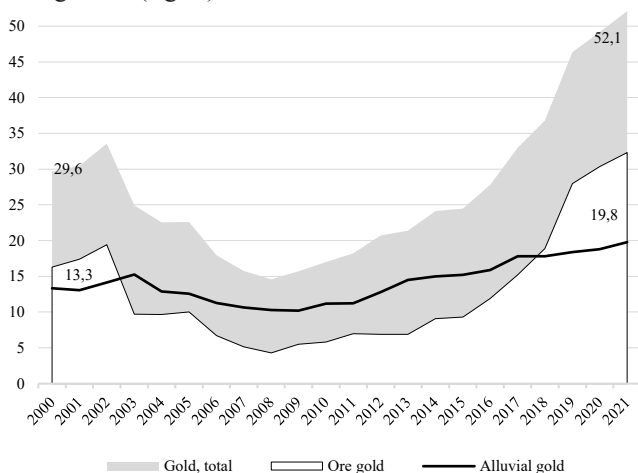
## Introduction

The mining industry plays a defining role in the economy of Magadan Oblast: it occupies 88% of the volume of industrial production; it forms almost 50% of own revenues of the regional budget (even taking into account benefits within the framework of regional investment projects and Special Economic Zone); the mining industry employs about 14% of those employed in the regional economy, not including workers in related and servicing industries.

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Magadan Oblast is a region of mono-resource specialization, the basis of its economy is the extraction of precious metals – gold and silver. Over the past six years, the stability of the industry, commissioning of new production facilities and steady increase of gold output in the Magadan region to the record level of 52 tons<sup>2</sup> (2021) (fig. 1) were secured by the stably high world market prices for gold and increase of the internal Russian ruble-dollar exchange rate (fig. 2).



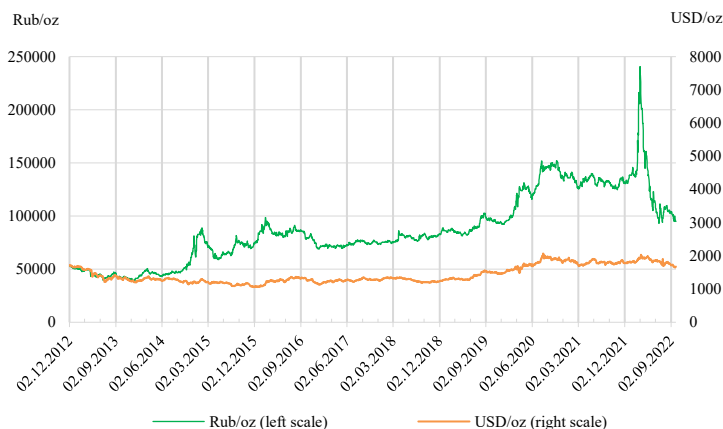
**Source.** [Pruss, Sharypova, 2019].

*Fig. 1.* Gold production in the Magadan region, t

Despite the fact that the share of alluvial gold production fell from 45% in 2000 to 38% in 2021 due to development of large ore deposits, the volume of alluvial gold production has grown by 1.5 times over the past 20 years. About 100 regional enterprises (mostly small) are engaged in placer mining and employ about 8,000 people, mostly locals. Apart from the contribution to the Russian gold mining, preservation of this sector for the region is important to provide employment for the population of the districts of the Magadan region, while in ore mining large Russian

<sup>2</sup> URL: <https://ru.investing.com/news/commodities-news/article-2128949> (access date: 04.07.2022).

companies use shift work organization method with attraction of workers from other regions of Russia.



**Source.** URL: <https://tozoloto.ru/grafiki/kotirovki/stoimost-zolota-na-segodnya.html> (access date: 04.07.2022).

*Fig. 2.* Change in the price of gold for 10 years (2012–2022).

With the introduction of foreign sanctions, gold mining, the production of which is mainly exported, has become very vulnerable. The scale of gold exports from Russia has particularly increased over the past two years, with 320 tons<sup>3</sup>, of gold produced in Russia in 2020<sup>4</sup> and 302 tons<sup>5</sup> in 2021<sup>6</sup> out of 340 tons, representing 4% of global gold exports<sup>7</sup>.

According to analysts, under sanctions, the most vulnerable were companies producing gold from placers, leading seasonal

<sup>3</sup> URL: <http://global-finances.ru/eksport-zolota-iz-rossii-po-godam/> (access date 08.11.2022).

<sup>4</sup> URL: <https://zolteh.ru/results/itogi-proizvodstva-zolota-v-rossii-v-2020-godu/> (access date 08.11.2022).

<sup>5</sup> URL: <http://global-finances.ru/eksport-zolota-iz-rossii-po-godam/> (access date 08.11.2022).

<sup>6</sup> URL: [https://nedradv.ru/nedradv/ru/page\\_news?obj=0a8b7ef8e482110b22e0685d6c28151b/](https://nedradv.ru/nedradv/ru/page_news?obj=0a8b7ef8e482110b22e0685d6c28151b/) (access date 08.11.2022).

<sup>7</sup> URL: <https://www.rough-polished.com/ru/analytics/125415.html/> (access date 08.11.2022).

production, because the price for the purchase of gold in the current environment is sometimes below the cost of most companies [Kashuba, 2022].

Note that in the Magadan region, the industry operates in harsh natural and climatic conditions, the provision of all consumables is done by external delivery with high transportation costs. For these reasons, the cost of gold production here is objectively higher than in more favorable climatic conditions or geographical location of the regions of Russia, especially this applies to placer gold, which has been mined for more than 90 years, so that at this point in the development remained deposits with very low metal content [Galtseva et al., 2019].

### **Situation assessment**

The main factors negatively affecting the preservation and development of the gold mining industry in the current environment are the following.

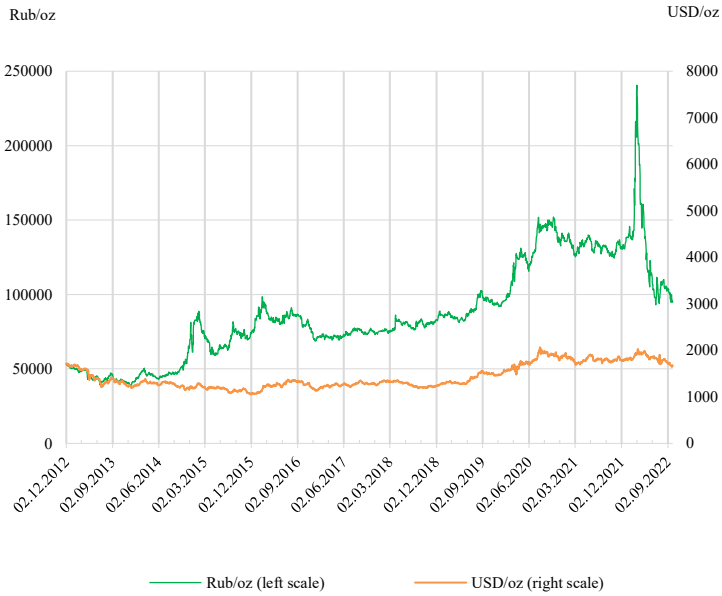
1. The dependence of the cost of gold on the world market price, calculated in dollars per ounce in the conditions of state regulation of the ruble-dollar exchange rate leads to the fact that in the conditions of falling world prices, the ruble revenues of Russian exporters are declining at an accelerated rate. Thus, between 15.04.2022 and 01.07.2022, the price of gold on the world market fell by 9% (from \$63.49 to \$58.44)<sup>8</sup>, while in ruble equivalent it fell by 42% (from 5251.12 to 3068.92 rubles per ounce). The higher (by 33%) drop of the gold price for Russian gold producers was caused by the decrease of the dollar exchange rate (Fig. 3).

2. The ban on the purchase of Russian gold by some G7 countries forces to look for new markets [Ruzleva, 2022]. Thus, until February 2022, 84% of Russian exports went to the UK, and only 1.3% to China. Since February, the Federal Customs Service of Russia does not disclose the volume of exports, we only know that in July, for

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<sup>8</sup> URL: <https://ru.bullion-rates.com/gold/USD/Daily-60-chart.htm> (access date: 04.07.2022).

example, gold exports to China increased 50 times compared with the same period last year<sup>9</sup>.



**Source.** URL: <https://ru.bullion-rates.com/gold/USD/Daily-60-chart.htm> (access date: 04.07.2022).

*Fig. 3.* Changes in the price of gold during the year, 2021–2022.

3. The application of sanctions against the major Russian banks (VTB, Sberbank), which were involved in buying gold from subsoil users and selling it in the world market, has forced mining companies to look for new intermediaries licensed to carry out operations with precious metals and sales in world markets. Due to the limited supply, the services of independent operators not under sanctions – refineries, banks, rose in price by 10–15%

<sup>9</sup> According to RBC. URL: <https://www.rbc.ru/newspaper/2022/08/26/63077c579a794790b222e6c8> (access date 08.11.2022).

[Kashuba, 2022], thereby reducing the purchase price of metal from subsoil users.

As a result, the price of gold purchases from subsoil users was reduced by 43–48% due to domestic factors (a 33% drop in the dollar and a 10–15% discount on the sale of gold by intermediaries) relative to the actual world market price and the ruble-dollar exchange rate, which existed before the events of February. Amid the declining financial performance of gold mining companies, banks have reduced lending and made their value dependent on gold prices, which (in particular – in the niche of placer gold mining) jeopardized the mining season of 2022, and the preparation for the season of 2023.

4. Due to the fact that the main mining companies use highly productive imported equipment and machinery (mainly Japanese – Komatsu, Caterpillar, Hitachi, to a lesser extent – South Korean (Hyundai) and Chinese), there is a need to organize alternative supplies of both equipment and imported spare parts for the already existing ones. The search for new partners and adjustment of new delivery channels will lead to the fact that the supply of spare parts will not only take longer, but also will become 10–50% more expensive, according to experts' estimates.

5. In addition to the rise in price of imported spare parts, there is an unreasonable increase in prices for domestically produced products. For example, the price of ammonium nitrate in 2021 in the Magadan region was 29.2 thousand rubles / ton, and in March 2022 it was 75.7 thousand rubles / ton (data from JSC “Susumanzoloto”).

Even if we assume that gold mining companies are well-provided with spare parts and equipment for the mining season of 2022, the cost of organizing operations next year will be significantly higher. In the Magadan Region, 70% of gold mining companies specialize in the development of placer deposits, and it is they who are in the most vulnerable situation. Thus, according to JSC “Susumansoloto” taking into account the rates of appreciation of costs for the extraction of placer gold (on average 10–15% a year),

as well as the newly acting factors (dollar exchange rate, conditions for buying gold and the rising cost of production) the costs in 2023 may increase by more than 40%.

A comparative assessment of the effectiveness of extraction of 1g of gold from the placer deposits, taking into account the new factors is performed on the example of JSC “Susumansoloto” (table).

**Efficiency of placer gold mining under different conditions  
on the example of JSC “Susumansoloto” in 2022, 2023.**

| Indicators   | Unit of measurement | 2022<br>(forecast as<br>of 03.01.) | 2022<br>(author's<br>estimate as<br>of 01.07) | 2023<br>(forecast) |
|--|---------------------|------------------------------------|---|--------------------|
| Through grades including refining by rock mass   | g/M <sup>3</sup>    | 0,075                              | 0,075   | 0,079              |
| Gold price on the world market   | \$/g                | 57,9                               | 58,4  | 54,9               |
| Exchange rate of Central Bank  | R/\$                | 74                                 | 52,5  | 50,9               |
| Price of gold at the CB exchange rate  | R/g                 | 4313                               | 3069  | 2797               |
| Discount on gold purchasing by intermediaries from gold price                              | %                   | 0,1                                | 10  | 10                 |
| Discounted price of gold   | R/g                 | 4200                               | 2762  | 2517               |
| Total cash costs of commercial pure gold   | R/g                 | 3454                               | 3454  | 4836               |
| Profit before income tax   | R/g                 | 746                                | -692  | -2319              |
| Income tax expense   | R/g                 | 149                                | 0   | 0                  |
| Net income   | R/g                 | 597                                | -692  | -2319              |
| Return on sales<br>(Net profit / to sales price)   | %                   | 14                                 | -25   | -92                |
| Required gold content for profitable operation and development with a profit margin of 10% | g/M <sup>3</sup>    | 0,072                              | 0,103   | 0,158              |

**Source.** Calculated by the author from the data of JSC “Susumansoloto”.

The forecast of the profitability of gold sales in stable conditions at the beginning of 2022 for the alluvial enterprises of JSC “Susumansoloto”, with an average gold content of  $0.075 \text{ g/m}^3$  of the rock mass was 14%. The average content of  $0.072 \text{ g/m}^3$  is sufficient to ensure profit.

As of 01.07.2022 taking into account the real world prices, the dollar exchange rate accepted by the Central Bank, the 10% discount of the price of gold and the earlier planned costs of extraction, the activity of JSC “Susumantzoloto” produces a negative financial result (the loss is 692 rubles / g of extracted gold, the profitability of sales – minus 22%). For profitable operation of the company in the current environment it is necessary to develop placers with a content of  $0.103 \text{ g/m}^3$ .

Forecast of mining efficiency for 2023 was based on an estimate of the price of gold on the world market<sup>10</sup> and the dollar rate in 2023, as well as taking into account a 40% increase in costs (10–15% annual growth rate in the previous period and an increase in the cost of imported spare parts by 10–50%). According to the calculations, the company’s losses will increase to minus 2,319 rubles / g of gold, and the required gold content on the rock mass for profitable mining should be  $0.158 \text{ g/m}^3$ .

## Conclusions and recommendations

We would like to stress that JSC “Susumansoloto”, whose data were used in these calculations, is the largest enterprise in Russia producing placer gold, which has a high-tech production at all stages of work, having the possibility of large-scale and advance purchase of inventory for work. Even this company can expect serious losses under the current conditions of management and sale of gold. At the same time in the region mainly small enterprises are engaged in alluvial mining, which do not have the advantages of JSC “Susumansoloto”, it can be assumed that their situation is even more critical.

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<sup>10</sup> According to the Economic Forecasting Agency (APECON) as of 07.07.2022. [El. resource] URL: <https://apecon.ru> (access date: 07.07.2022).



This situation will most of all affect placer gold mining and may lead to the following negative consequences for the socio-economic situation in the Magadan region:

**in the gold mining industry.**

- closure of about 100 enterprises engaged in placer gold mining due to a sharp decline in profitability under the existing economic and organizational conditions in the 2022 season, under which the breakeven development will be ensured at deposits with the content of not less than 0.103 g/m<sup>3</sup> of rock mass, but such quality of placer deposits is unlikely even at a single objects of the region;
- loss of 20 tons of gold mined by alluvial enterprises, which is 4.5% of all-Russian production in 2021<sup>11</sup> (see Fig. 1);
- taking into account the expected rise in costs next season by about 40%, the average gold content at the placer deposits in the Magadan region for profitable mining should be at least 159 g/m<sup>3</sup> (in 2022, only the changed organizational conditions of the industry were taken into account – the decline in the dollar, the discount when purchasing gold by brokers; in 2023, the forecast growth of costs for spare parts and consumables due to a higher cost of supply in connection with the sanctions was additionally taken into account);
- in conditions of unprofitability of metal production of the current year, gold mining companies will be in a state of investment "starvation", as the operating loss will not allow to maintain and develop the mineral resource base and the program of technical re-equipment for future development;

**in the socio-economic development of the region:**

- about 8 thousand people will be unemployed, their families will have a dramatically lower standard of living;

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<sup>11</sup> URL: [https://lprime.ru/state\\_regulation/20220328/836525572.html](https://lprime.ru/state_regulation/20220328/836525572.html)

- the budget of Magadan Oblast will lose about 20% of revenues, which are provided by the placer enterprises.

In order to prevent the negative development of the situation in the Magadan Oblast and the gold mining industry, it is necessary to take a number of measures of state support. In particular, the author, in consultation with subsoil users, proposes the following measures.

To include the gold mining industry in the lists of industries affected by sanctions, and in the Magadan Oblast to include the main alluvial gold mining enterprises among the backbone ones in order to be able to use special support measures, including:

- granting loans at a subsidized rate;
- subsidizing a part of transportation costs when reorienting to other suppliers of imported spare parts and consumables;
- compensation of losses incurred due to the internal dollar/ruble exchange rate and discounts on purchases by intermediaries to sell gold on foreign markets.

1. Form a list of banks to buy gold from subsoil users without a discount with the support of these banks by the state.

2. Apply support mechanisms to achieve break-even operation of gold mining companies in the form of tax incentives (mineral extraction tax, profit tax, etc.).

3. Compensate the regional budget for the amount of lost revenues from the federal budget.

At the regional level, it is advisable to do the following.

1. Creation of a unified regional structure, providing a centralized search for alternative ways of supplying imported spare parts and consumables; organization of lending to subsoil users; gold sales, including in the world market. An example of the organization and the functions performed may be the GU “Fonddragmet” that existed in the Magadan region from 1998 to 2012, during a difficult period for the industry (the low price of gold, the lack of collateral from small businesses to obtain bank loans). At that time, it was not possible to implement all the plans in terms of functionality, however, at present, the creation of such a structure

with state guarantees represented by the regional government may be the way out in this situation.

2. Search for opportunities to sell gold in the markets of the countries that have not joined the sanctions – China, UAE, India (for example, China, carrying out about 20% of world gold mining does not export the metal, developing domestic demand and is potentially a major importer of gold)<sup>12</sup>. Small placer mining companies with 50–100 employees cannot search the market, that is why it is suggested to search with the help of the Magadan regional government, including in the countries that have not joined the sanctions and are large consumers of gold.

3. Reactivation of the Kolyma refinery, the controlling interest in which belongs to the Government of the Magadan region, it can become a center of refining metal and its sale to the enterprises of the Magadan region, Chukotka Autonomous District and the Republic of Sakha (Yakutia)<sup>13</sup>.

Now gold for refining is exported to plants in other regions of Russia – Prioksky Non-Ferrous Metals Plant, Krasnoyarsk Gulidov Non-Ferrous Metals Plant, etc. The region should initiate the creation of an enterprise for the production of alternative spare parts for imported equipment, the assembly of imported equipment (possibly Chinese) or the organization of similar workshops on the basis of the Magadan Mechanical Plant.

Assessment of the effectiveness of alluvial gold mining in the Magadan region was performed as of 01.07.2022, however, there were no fundamental changes in the situation during the preparation of the article. The price of gold in rubles has increased by 3.3% as of 10.03.2022 (the world market price has decreased by

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<sup>12</sup> URL: <https://gold.lprime.ru/analytics/20220310/447049.html> (access date: 28.05.2022).

<sup>13</sup> During the operation of Kolyma Refinery its services were used by all subsoil users of the Magadan Region, some enterprises of the Republic of Sakha (Yakutia) and Chukotka AO (a total of 120 enterprises in 2013).

URL: [https://nedradv.ru/nedradv/ru/page\\_industry?obj=6523d3f2a049e7e13f19f0300e0281d8](https://nedradv.ru/nedradv/ru/page_industry?obj=6523d3f2a049e7e13f19f0300e0281d8)

6.5 dollars/year<sup>14</sup>, the dollar exchange rate has increased by 13%<sup>15</sup>). In August 2022, the company Susumansoloto JSC<sup>16</sup> (about 7 tons of annual gold production) was acquired by the Ural Mining and Metallurgical Company (UGMK), which has a license to export gold. Thus, the region's largest alluvial gold miner at the price of the loss of its independence reduced the risk of bankruptcy. Nevertheless, small companies still have problems. And if in 2022, using the previous stocks of consumables and spare parts, companies continued to produce gold to repay loans, only reducing production volumes due to unattractive selling prices, the preparation for the next season remains a big question for them. According to experts [Leskov, Baushev, 2022], it is the small companies producing placer gold, as a rule, with production volumes ranging from grams to the first hundred kilograms, that are the most vulnerable in the current conditions. In the Magadan Region there are about 100 such companies and they extract 63% of alluvial gold (about 12 t).

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<sup>14</sup> URL: <https://ru.bullion-rates.com/gold/USD/Daily-60-chart.htm> (access date: 11.10.2022).

<sup>15</sup> URL: <https://kurs.vip/currencies/cbr/usd/2022-10-03> (access date: 11.10.2022).

<sup>16</sup> URL: <https://zolotodb.ru/article/12849> (access date: 03.10.2022).

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