doi: 10.18720/SPBPU/2/id19-129

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THE GOLD-BEARING QUARTZ SANDS IN THE ARCTIC REGION OF YAMAL-NENETS AUTONOMOUS DISTRICT

Abstract*. Many of the areas in which gold occurs or may occur In Russia, almost not affected by the study completely and this, in a particular case, will be reflected in this article. Unfortunately, in recent years many programs of perspective study of territories, searches and investigation of firm minerals have been curtailed. Perhaps the prospects of development of raw materials base of the polar Urals is associated with rossypnye sites (districts), Yamalo-Nenets Autonomous district , which are located in the lowland continuation of the(up to 200-300km)of the Eastern slope of the Urals. It is dominated by shallow alluvial placers in the valleys of the lower order(Nadymsky, Purovsky, Tazovskaya lowland). According to the selected representative samples in the area of prospecting, as a result of mineralogical analysis by experts TsNIGRI made the following conclusions:*
1. Gold in the samples is typical of the upper Pleistocene alluvial deposits of the platform.
2. Gold is easily extracted with the help of modern enrichment devices.
3. All samples contain signs of fine (0.5-0.25 mm) and fine gold (0.05-0.1 mm) and further prospecting is necessary to determine the possible industrial value.
The obtained, as a result of testing quartz Sands, the gold content is low, and the found gold refers to small and thin, but with a huge mass represented by quartz Sands, sometimes lying for tens of square kilometers, according to approximate calculations, give absolutely significant reserves, reaching many hundreds of tons.
The author proposes, for the purpose of determining the gold mineralization of quartz sand and underlying permafrost soils, carrying out of search works with a short drilling, with the obligatory selection of core river valleys area of study.
With the obvious gold mineralization of the bedrock, located on the Eastern slope of the Urals, the actual study of placer gold within the specified areas to which, there is reason to assume dedicated Stalinist railway (construction №501-503).
Keywords*: Gold, placers, quartz Sands, permafrost, the Arctic area of the Yamal-Nenets Autonomous district, building No. 501-503, Nadym.*

In the lithosphere, the fraction of 0.9-0.01 mm of gold accounts for about 75% and the main reserves of prospecting, exploration and production of the near future are undoubtedly associated with small and thin gold [5, 11]. In the world, its associated extraction from sand deposits and sand-gravel mixtures became an additional source of extraction of precious metals. The study area is located in the tundra zone, which is a wetland plain with many rivers and lakes, and belongs to the Nadym - Purov geocryological region, a zone of intermittent distribution of permafrost rocks. The role of permafrost rocks of Nadym and Purovsky

districts in the formation of placer deposits is very significant and this issue is currently poorly studied.

Gold deposits of the Northern Urals at the present stage is represented mainly gold-quartz type deposits, and this, presumably, linked to such a powerful extent quartz sand, sometimes ferruginous, in Nadymsky, Purovsky, Tazovsky and other districts of the YNAO. And at the same time, quartz placers of the specified areas have no visible connection with an indigenous source and are formed, probably, at the expense of intermediate collectors. Ferruginous quartz Sands of the specified areas was a sign of the search for the presence of gold. Together with gold in these quartz Sands can be platinum, kannamoochi, currently in small volumes from the quarries of quartz sand (used for construction purposes), these areas are mined carnelian.

In 1996, with the support of the municipality of Nadym, the author selected two representative samples of quartz sand a few kilometers from the town of Nadym (Nadym district of YANAO), which were sent to TsNIGRI for mineralogical analysis in order to determine the gold content in samples. The results of the analysis showed the presence of thin gold with a gold content of -0.176 g/t in the sample№1 and in the sample№2-0,247 g / t Conditions provided that the gold content in the cubic meter of rock mass should be at least 0.11 grams. Below this line, field development is considered unprofitable. TsNIGRI found that free gold particles are characterized by the size of hundreds to tenths of a mm, as well as the fact that their extraction is possible in gravity enrichment devices, with the highest extraction rates (up to 55%) obtained in the centrifugal apparatus – concentrator type "Nelson". Experts TsNIGRI, conducted mineralogical analysis recommended that, at a time, hold in the Nadym area of further exploration research. However, there was a financial crisis in 1998 and, due to lack of funds, further research was not possible.[1]. In 2000 - 01godah, at the request of the Yamal mining company, the author was given the opportunity to test 96 samples in waste and operating sand pits, which also showed the presence of gold [1]. According to the results of the analysis the following conclusions were made:

1. Gold in the samples is typical of the upper Pleistocene alluvial deposits of the platform.

2. Gold is easily extracted with the help of modern enrichment devices.

3. All samples contain signs of fine (0.5-0.25 mm) and fine gold (0.05-0.1 mm) and further prospecting is necessary to determine the possible industrial value.

In 2002, also at the request of the author, together with employees of the Yamal mining company, was conducted heavy mineral concentrate sampling on the river Pangody, in the concentrates was discovered Goldberry, covered with a thin film of iron oxides. It is known that if the

gold has a dark-brown or black "shirt" (a film of hydroxides) -this is a direct sign in search of large gold in the vicinity of New Urengoy on large areas and long quartz Sands are located, which are one geological structure with Nadym. The necessary search and assessment work on promising areas in Nadym, Purovsky districts were not carried out further all for the same reason-lack of funding.

Obtained, as a result of testing quartz Sands, the gold content is low, and gold particles are extremely fine, but with a huge mass represented by quartz Sands, sometimes lying on dozens of square kilometers, according to approximate calculations give absolute significant reserves, reaching many hundreds of tons.

On the territory of Nadym district, starting with the period of development of deposits of hydrocarbonic raw materials, and our days were many works in engineering, surveying nature, and geological with the purpose of the evaluation and exploration of oil and gas, and building materials. However, in these areas a search operation with the purpose of evaluating the gold mineralization, the PT potential, etc during the specified period was not carried out. During the period of development of oil and gas fields in the territory of YANAO hundreds of PGS and peat deposits were developed and partially recultivated. Short-range wells (up to 20 m) from the bottom of quarries with core testing could provide valuable information on the content of precious metals in quartz Sands and permafrost.

In the territory of YANAO the most favorable places of accumulation of gold-containing placers of quartz Sands are-Nadym, Purovsky, Taz lowlands. Sartan glaciation has left places in these areas boulders and gravel and they are of great interest in the search for gold deposits. The specific areas proposed for search and assessment are as indicated above. in the territory of Nadym, Purovsky districts, in places of considerable distribution of quartz Sands in vicinities of Nadym, settlement Pangody, Novy Urengoy, etc.

Presumably, the gold-bearing quartz Sands Nadymsky, Purovsky district, Yamal-Nenets Autonomous district, formed by water and are horizontal, sometimes very slightly oblique, elongated, ribbon-like deposits, which are located everywhere. The sizes of deposits of quartz sand of Nadym, Purovsky districts make from tens meters to tens kilometers. The origin of such a powerful distribution of quartz Sands due to the destruction in Cenozoic-Mesozoic periods of the Ancient Urals. The indigenous sources of the polar Urals placers have not yet been studied sufficiently. Deep-lying placers are characterized by a complex, multi-layer structure, with a gold content, which is formed from particles that have passed the eluvial and deluvial stages of formation and have experienced repeated re-application in the course of the onset and retreat of the sea, the destruction of the Ancient Urals. To date, most researchers dealing with

scattering in other areas, proceed from the premise of the possibility of transfer of gold particles by water flow and consider these particles as one of the components of the heavy fraction in alluvium [5, 9, 12]. In the case of longitudinal displacement of the sediment, the tendency for gold particles to penetrate rapidly into the lower part of the transported layer and lag behind the alluvial particles represented by light minerals is characteristic.[6,7,8]. Despite this, there are common patterns of transport, accumulation and differentiation of sediments, including heavy fraction, which is confirmed by numerous studies of the relationship of the structure of placers with the dynamics of the flow. One of the little studied questions of scattering is the question of the range of movement and features of the formation of thin (≤0.1 mm) and small (0.1-0.5 mm) gold [2]. The possibility of formation of placers from fine and thin gold and their accumulation contributes to a number of conditions-the morphology of particles, small slopes of the longitudinal profile [2]. The morphology of the valleys with a long history of formation is a " function not only of the interaction of various factors of the natural environment, but also of its historical development and is the result of changes that the river experienced in various stages of evolution" [9]. To trace the evolution of the paleo-channels and associated placers during the long geological periods of the valleys formation is quite a difficult task.

Behavior in placers of very fine gold is such that, in connection with hydrophobic properties of its surface, small scales become «floating» and in huge quantities is transferred by water streams, practically on unlimited distances.

The maximum dimensions of flat floating gold particles reach 0.1 mm) the minimum close to colloidal. A certain amount of gold may linger on the bottom of the watercourses in the clay substance. Placers of the studied areas were formed in different climatic and geological-geomorphological conditions and are represented not only by quartz Sands, but also by permafrost soils, which in the considered areas are unevenly located from a depth of 6m or more.

According to the author's observations, the smallest Golden scales are collected along the banks near the surface of river quartz sand according to some separate samples of concentrate testing. Gold pieces in the form of small scales settle at the weakest current, very far from the main placers and despite the possible General source of education, between indigenous and placer formations lies a long distance, and it is not possible to trace the migration of gold from the indigenous occurrence. However, a characteristic feature of alluvial placers is that the concentration of heavy minerals increases to the bed of the valley. Alluvial sedimentation and the subsequent formation of placer deposits in the recent geological past were often complicated by glaciers, overlapping valley powerful boulder-boulder-sandy-clay deposits – moraines that occur in the upper river

Pangody and on the hills near the town of Nadym (YANAO). Fluvioglacial deposits, which may contain high concentrations of gold, are associated with moraine erosion after glaciers melting.

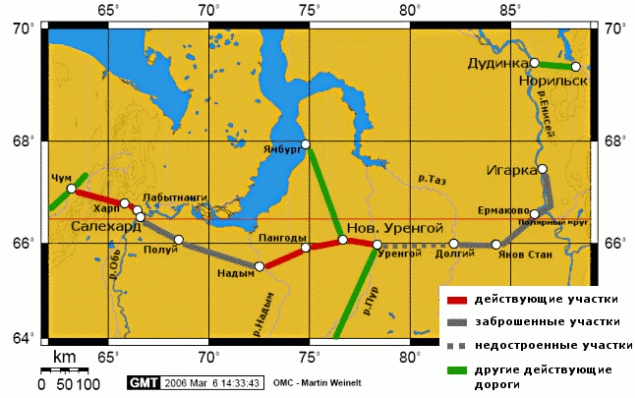
For carrying out prospecting works, for the purpose of determination of gold content of perennial soils, detailed drilling with selection of a core in valleys of the rivers of areas of research is required. A search operation is preferable to conduct a small-diameter wells, because of the geological conditions of the study area little studied (power and loose permafrost sediments, their alonistioti, relief, raft, etc.). First of all, it is necessary to select and cut the possible placer gold deposits in the medium-flow quartz Sands by search and survey works. Search works must necessarily completely cross all elements of the relief of the valleys of the studied rivers-Nadym, Pangody, PUR, Taz). The Deposit of placer gold in the study areas can be detected at the border of permafrost soils and developed by open-pit industrial enterprises with natural and artificial layer-by-layer defrost to a depth of 25-30 m and underground method to a depth of 50 m. Presently developed equipment allows you to remove virtually any gold, but you must first determine the scattering parameters, and then use the right equipment, the Development of permafrost soils, with the original autopsy of overburden (peat), produced with their advanced defrost in the summer (natural layering, the needle gidriatika) or loosening bulldozers-rippers. Development of placers earthmoving machinery is made at a depth of up to 50 m.

Quartz sand areas of the YANAO are also valuable minerals. Quartz sand is an important component in the production of glass, earthenware and porcelain. It is also necessary for the manufacture of paints and filter elements and is used in many other industries.

The construction of the railway along the Northern Arctic circle Salekhard - Igarka, also known as the "dead road", which can be considered one of the most ambitious projects of the Gulag, is connected with the gold content of these territories [3, 4]. The need for the construction of this railway, perhaps, was caused by two reasons: economic - development of the Northern territory, rich in minerals (on the assumption of the author-it is the gold content of the territory) and military-strategic - with the protection of the Arctic coast. This construction may have been timed to coincide with the gold and placer belt stretching from the Eastern slope of the modern Urals to Igarka and more. Construction site No. 501 began with the centre in Salekhard, and No. 503 from Igarka (management had rooms, because the building was classified). The construction of the railway was carried out to meet each other (for the purposes of secrecy of this facility Northern railway (construction site No. 501 and No. 503), the Soviet leadership organized in 1947. By assumption of the author, the railway crossed possibly studied and prepared for further geological exploration earlier, placer gold deposits. Search works the area was studied

even before the great Patriotic War, since even during the war on the territory of the future construction carried out survey research

Despite all the well-known extremes resorted to by the head of the USSR Stalin, he became the first politician to address the issue of the search for minerals in the Arctic region. Important is the fact that he was serving a link in the years 1914-17 in the village of Kureyka (170 km South of Igarka) Turukhansk region, rich in gold ore and placer deposits of gold, discovered recently. The construction of the road to Igarka would make it possible to build a highway to the Bering Strait, and would ensure transport accessibility of the entire Arctic North.



Picture 3. Scheme of "Northern latitudinal railway". Source: http://www.skyscrapercity.com/showthread.php?p=144173155

However, immediately after the leader's death in 1953, the road was urgent manner dismantled and virtually destroyed, although the meeting of two of the buildings were hundreds of miles and the destruction of the railway there has also been no small means, almost equivalent to the construction. It remains only to assume that:

1. Construction of 501, 503 construction was due to the intention of the country's leadership at the time to develop gold deposits and further export of ore for further enrichment in the direction of the Ural gold mines.

2. After Stalin's death, came to power, the Soviet Government did not appreciate the seriousness of the project and very quickly destroyed the railroad, although it could serve to this day

The author conducted a review of major stations buildings № 501-503 to the gold-bearing territories associated to the stations. Of the 29 construction stations № № 501-503, 11 of the following stations are timed to coincide with gold deposits and occurrences:

1) Station number 1. Eletskaya station, KOMI Republic, 2) Station number 2. St. Sobj, 3) Station №3. art. Harp, 4) Station number 4.article. Obskaya, 5) Station number 5, article Nadym. G. Nadym. As described above, in 1996 the author were selected two representative samples in the vicinity of Nadym and the obtained results give grounds to conclude that further studies are needed to search for and study of gold mineralization of quartz sand in the Nadym district,6) Station No. 6.article Pangody. The results of the dressing test gave encouraging results, 7) Station №7, 8 St Turukhan-Yanov Stan, Turukhan river. Yanov Stan-

village on the river Turukhan, 8) Station № 9-11, the Yenisei river, Yenisei St., city of Igarka. Yenisei gold ore district is located on the right, the Bank of the river Of the Yenisei river and is a huge area.

At the end of October 2017, at the Federal level, a decision was made to build the Nadym – Salekhard railway. The project of the Great Northern railway, which was dreamed of before the revolution, may still be implemented and will at the same time be one of the best tourist routes of world importance in the Arctic zone. The historical tourist route may be the "Museum" in the open air with the exhibits of the construction № 501-503, where the remains of former camps, locomotives, destroyed road, bridges are still preserved.

In recent years, demand for gold has increased significantly in the global market, due to a significant reduction in the world's gold reserves, even in remote areas of the Arctic, which is a region of special geostrategic interests of many States. Russia has long engaged in the search for alluvial gold and, using a system of subsoil licensing, in fact, "cleans" loose depleted resource base, residual production capabilities of which are not associated with Tselikov deposits and technogenic placers [13]. GRR production in Nadym, Purovsky districts at the expense of Federal funds will make it possible to prepare a vast territory for further mining operations.

As a result promouterskih works and evaluate historical information (buildings 501, 503 buildings) can make a specific conclusion that the Nadym, PUR and other regions of Yamal are promising in the search for placer deposits of gold, besides the vast expanse of quartz sand is interesting as a material in many industries, opportunities for creating new enterprises solving the problems of the Northern single-industry towns

The Russian Arctic has significant prospects for the development of the mineral resource base of gold placers not only in Taimyr, the Arctic Islands and the shelf of Chukotka, Yakutia, but also in some areas of the YANAO, which is part of the Arctic zone [10]. Mineral resource base of small and fine gold In Russia may become the Arctic regions of Yamal-Nenets Autonomous district. The further development of SMEs of gold will depend on the investment and efficiency of GRR at the expense of the Federal budget in the early search stages associated with the risk of a negative result and at the expense of subsoil users-at the stage of obtaining an increase in reserves

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