

Report on the work of the dissertation Council

Dissertation Council on metallurgy and materials science at the Kazakh national research technical University named after K. I. Satpayev on specialties (direction of training):

- 6D070700 - Mining;
- 6D071100 - Geodesy.

1. Data on the number of meetings held – ... meetings.

Surnames, first name, patronymic (if any) of the members of the dissertation Council who attended less than half of the meetings: the overwhelming majority of the members of the council attended more than half of the meetings.

Carsten Drebensteth - Doctor of Technical Sciences, 6D070700 - Mining (Germany) - attended less than half of the meetings for a good reason.

2. List of doctoral students indicating the organization of training:

- N.Khairullayev– KazNRTU named after K.I.Satpayev;
- S. Toktamissova– KazNRTU named after K.I. Satpayev;
- B. Sadykov – KazNRTU named after K.I. Satpayev;
- A. Umirbayeva – KazNRTU named after K.I. Satpayev;
- A. Altayeva – KazNRTU named after K.I. Satpayev;
- Toktarov Ayan – KazNRTU named after K. Satbayev;
- Bakhmagambetova G. – KazNRTU named after K.I. Satpayev;
- Bektur Bakytbek. – KazNRTU named after K. Satbayev;
- Asfandiyar Aytказыuly Orynбай – KazNRTU named after K. Satbayev.

1. Brief analysis of dissertations considered by the Council during the reporting year

| № | Full name of the doctoral student | Topics of work | Code and title of specialty |
|---|-----------------------------------|--|-----------------------------|
| 1 | Khairullayev Nursultan | Increasing the efficiency of ISL uranium with solution activation | 6D070700 - Mining |
| 2 | Toktamissova Saltanat | Combined pumping units for improving the efficiency of operation of extraction wells of uranium deposits | 6D070700 - Mining |
| 3 | Sadykov Batyrkhan | «Improving the risk management method in conditions of intensive field development based on the use of GIS technology» | 6D071100 – Geodesy |
| 4 | Umirbayeva Aliya | «Creation of ecological maps of the Semipalatinsk test site (STS) based on innovative monitoring methods» | 6D071100 – Geodesy |
| 5 | Altayeva Assel | «Improving the method of geodetic observations of the earth's surface of the Orlovsk mine using GIS technologies» | 6D071100 – Geodesy |
| 6 | Toktarov Ayan | Development of the mining transport system of iron ore mines with the increase of mining depth | 6D070700 – «Mining» |
| 7 | Bakhmagambetova Gulnara | Development of leaching technology for poor gold-bearing ores taking into account the interaction of solution with dispersed particles | 6D070700 - Mining |

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| 8 | Bektur Bakytbek | Development and substantiation of the design of the support of a vertical shaft being constructed in difficult mining and geological conditions (on the example of the mine DNK) | 6D070700 – «Mining» |
| 9 | Asfandiyar Aytказыuly Orynбай | Development of innovative methods for automated determination of the structural characteristics of blasted rock based on information technologies | 6D070700 – «Mining» |

4.1 The analysis of the subject of work of Khairullayev N. Khairullaev Nursultan Batyrkhanovich "Improving the efficiency of uranium PSV with solution activation", submitted for the degree of Doctor of PhD in the specialty 6D070700-"Mining".

The dissertation work of the doctoral student of KazNTU named after K.I. Satpayev Khairullaev N.B. is devoted to the problem of increasing the uranium content in the productive solution and reducing the reagent consumption during underground borehole leaching of uranium, which requires special studies that have been conducted in this work.

based on the results of laboratory studies and experimental industrial work, it was proved that the use of the proposed technology of underground borehole leaching leads to an actual increase in the uranium content in the productive solution by 8%.

An original technology of mechanical activation of the working solution has been developed, which is characterized by low capital and operating costs, allowing to increase the activity of the leaching solution.

The connection of the topic of the dissertation with the directions of development of science, which are formed by the Higher Scientific and Technical Commission under the Government of the Republic of Kazakhstan in accordance with paragraph 3 of Article 18 of the Law "On Science" and (or) state programs. The dissertation work was carried out within the framework of the economic agreement No. 50 – LLP – 19 dated 20.02.2019 "Development of technology for intensification of denitration and leaching processes in the conditions of the Central section of the Mynkuduk deposit (2019-2020).

Analysis of the level of implementation of the thesis results in practice.

During the period of the work, 9 scientific articles and reports were published, including: 2 articles published in the Scis database (percentile 50 and 28); 1 article in publications recommended by the KKSON RK; 4 articles published in the materials of International conferences, 2 of them abroad (Russia) and 2 – RK; 2 articles in other journals.

There is an act on conducting semi-industrial tests.

4.2 The analysis of the subject of work of Toktamissova S. «Combined pumping units for improving the efficiency of operation of extraction wells of uranium deposits», submitted for the Ph.D in specialty 6D070700 - Mining.

Experimental studies have established that the use of a combined pumping unit in pumping wells for the extraction of uranium by the method of underground borehole leaching makes it possible to achieve a rational mode of pumping out the productive solution with an increase in flow by an average of 25% and an increase in overall efficiency by 8-10%.

2. An original technique for computational modeling of the operating modes of a tandem pumping unit in downhole conditions in the system «productive formation - well – pump» has been developed, which makes it possible to determine, with sufficient accuracy for practical application, the rational depth of its immersion under the dynamic fluid level in the well and the design parameters of the main elements of the jet pump to ensure optimal operating modes of the combined pumping unit.

3. Calculation and experimental studies have established a significant influence of the profile and cleanliness of the working surface of a high-pressure nozzle on the formation of the jet profile and the energy loss of the working fluid and its relative position relative to the mixing chamber.

The connection of the topic of the dissertation with the directions of development of science,

which are formed by the Higher Scientific and Technical Commission under the Government of the Republic of Kazakhstan in accordance with paragraph 3 of Article 18 of the Law "On Science" and (or) state programs. Scientific research on the topic of the dissertation was carried out within the framework of the grant «2018 / AP05131363» on the topic: «Research and development of equipment and technology for pumping out productive solutions in underground well leaching using combined jet pumping units», for 2018-2020.

Analysis of the level of implementation of the thesis results in practice.

During the period of the work, 10 scientific articles and reports were published, including: 2 articles - in peer-reviewed publications recommended by KKSON; 4 articles - in international scientific journals with Q2 and Q3 quartiles, included in the Scopus database; 4 reports - at international conferences, incl. 1 report in a foreign international conference.

Also, 2 patents of the Republic of Kazakhstan for a utility model and 1 patent of the Republic of Kazakhstan for an invention were received; a textbook "Jet and tandem pumping units" with a volume of 9 p.l. was published. for use in the educational process in the preparation of undergraduates and doctoral students.

4.3 The analysis of the subject of work of B. Sadykov «Improving the risk management method in conditions of intensive field development based on the use of GIS technology», submitted for the Ph.D in specialty 6D071100 – Geodesy.

The dissertation paper of the doctoral student of the K.I. Satpayev KazNRTU Sadykov B. is devoted to the actual problem of mining production - ensuring the safety and efficiency of field development. With an increase in the depth of mining, mining and geological conditions become more complicated, the area of mined-out spaces increases, which leads to intensive displacements of rocks and the earth's surface. Therefore, in this dissertation work, a methodology for predicting shear zones is proposed, which ensures safety, efficiency of decision-making and economic efficiency of field development as a whole.

A criterion has been developed for solving the problems of zonal zoning of the earth's surface of the deposit according to the degree of failure risk based on changes in geoenergy, including the potential energies of gravity and elastic deformation of the rock mass, taking into account its heterogeneity.

A correlation has been established between the magnitude of the limiting subsidence of the earth's surface and the change in the geoenergy of the rock mass.

A technique for optimizing geodetic measurements based on the geoenergy potential of a mountain range has been developed.

The connection of the topic of the dissertation with the directions of development of science, which are formed by the Higher Scientific and Technical Commission under the Government of the Republic of Kazakhstan in accordance with paragraph 3 of Article 18 of the Law "On Science" and (or) state programs. Scientific research on the topic of the dissertation was carried out within the framework of the grant "2018 / AP05133929" on the topic: "Development of a forecasting system and geomonitoring methods for displacements of a rock mass in dangerous areas of the earth's surface during the development of subsoil resources based on innovative methods of GIS technology", for 2018-2020.

Analysis of the level of implementation of the thesis results in practice.

11 scientific papers were published on the topic of the dissertation, including 1 in the journal, included in the Scopus database, quartile Q3, percentile 47; 3 articles in publications recommended by the Committee for Control in the Sphere of Education and the Ministry of Education and Science of the Republic of Kazakhstan; 1 article in a journal belonging to the Higher Attestation Commission of the Russian Federation; 5 articles in international conferences and other publications.

4.4 The analysis of the subject of work of A. Umirbayeva «Creation of ecological maps of the Semipalatinsk test site (STS) based on innovative monitoring methods», submitted for the degree of doctor of philosophy (PhD) in the specialty 6D071100 – Geodesy.

The dissertation paper of the doctoral student of the K.I.Satpayev KazNRTU Umirbayeva A. is devoted to establishing the variability of radioactive contamination of the territories of the

Semipalatinsk test site (STS) in order to create environmental maps for the safe use of land in the national economy. The possibilities of terrestrial and space technologies for mapping radioactively contaminated sites on the territory of the STS on the basis of the results of integrated monitoring have been studied.

The methodology for conducting complex monitoring of the state of the natural environment, including remote sensing, geodetic support of geoecological studies, has been improved, which allows assessing the state of the modern radiation background of the STS territories.

The nature of the variability of long-lived radionuclides exceeding the established standards is established on the basis of the identified patterns of movement of artificial radionuclides, taking into account their numerical parameters.

The reason for the lack of vegetation cover in the areas of SIP test sites has been established.

Based on the results of the research, ecological maps were created using GIS technologies, displaying the radiological and ecological situation on the territory of the STS and contributing to the adoption of effective decisions on the safe use of landfill lands.

The connection of the topic of the dissertation with the directions of development of science, which are formed by the Higher Scientific and Technical Commission under the Government of the Republic of Kazakhstan in accordance with paragraph 3 of Article 18 of the Law "On Science" and (or) state programs. Scientific research on the topic of the dissertation was carried out on the personal initiative of the researcher and scientific supervisors.

Analysis of the level of implementation of the thesis results in practice.

According to the results of the work of Umirbayeva A., 15 publications were published, including: 2 articles in journals included in the Scopus database (percentile - 70) and Web of Science (pre-base), including 4 scientific publications recommended by the Committee for Control in the Field of Education and Science of the Ministry of Education of the Republic of Kazakhstan, 7 articles in the International Scientific and Practical Conference, 1 patent for an invention and 1 monograph in co-authorship.

4.5 The analysis of the subject of work of Altayeva A. "Improving the method of geodetic observations of the earth's surface of the Orlovsk mine using GIS technologies", submitted for the degree of doctor of Ph.D in the specialty 6D071100 – Geodesy.

The dissertation paper of the doctoral student of the K.I. Satpayev KazNRTU Altayeva A. is devoted to the topical issue of monitoring displacements and deformations of the earth's surface during the intensive development of ore deposits.

The dynamics of changes in intensive displacements has been established, on the basis of which deformation zones of the earth's surface of the Orlovsk mine have been fixed.

First settling zone. This subsidence thicket was formed in the area above the Novoe-Sever deposit and covers observation benchmarks 35, 34, 33, 32, 31, 30, 29, 28, 27, 26, 25 of the 0LO profile line. The subsidence zone in this zone is associated with mining operations. Ground observations of the subsidence thicket are not possible, since a reservoir has formed in this zone. For the safety of work, the only method of collecting information about the course of surface deformation processes is radar interferometry.

The second subsidence zone is located in the southeastern part above the Main deposit and covers observation benchmarks 35, 34, 33, 32, 31, 30, 29, 28, 27, 26, 25 of the 6LSH profile line.

The third subsidence zone was formed in the southeastern part of the mine surface, which covers the profile lines 10YuLO and 16YULO. Intensive subsidence in this area is associated with underground mining operations over the Novoe-South deposit.

The methodology for the comprehensive assessment of geomechanical monitoring of earth surface subsidence processes has been improved, including the use of radar interferometry data, high-precision leveling and the creation of a geomechanical model of the Orlovsk mine, reflecting predicted deformation zones and geomechanical indicators that provide a clearer and more detailed visualization of geological conditions at the site of deformations of the earth's surface to make the best technical decision.

A three-dimensional geomechanical model of the Orlovsk mine has been created, consisting of a

wireframe geological and structural model, a block geomechanical model and a digital database that includes numerical values of all the main geomechanical parameters: RQD - rock quality indicator; FF is the number of cracks per meter; RMR - rating indicators according to Benyavsky, Lobshir, GSI - Geological Strength Index according to Hook; Q – quality index according to Barton et al. This model evaluates the state of the rock massif of the Orlovsk deposit and, based on the results of the analysis, stable parameters are recommended for safe and efficient mining of the deposit.

Connection of the dissertation subject with the directions of science development that are formed by the Higher Scientific and Technical Commission under the Government of the Republic of Kazakhstan in accordance with paragraph 3 of article 18 of the Law "On Science" and (or) state programs. The dissertation work was carried out by the Author as part of the research work of the Department of Geomechanics of the Institute of Mining named after D.A. Kunaev on the research project "Development of geomechanical models of the Artemyevsk, Orlovsk, Irtysh fields" from 2016 to 2017.

Analysis of the level of implementation of the results of the dissertation in practice. 10 publications have been published on the topic of the dissertation, including 1 article in journals peer-reviewed by the Scopus database; 4 articles in publications recommended by the Committee for Control in the Sphere of Education and the Ministry of Education and Science of the Republic of Kazakhstan; five articles in collections of international conferences, forums and congresses.

4.6 The analysis of the subject of work of – Toktarov A. «Development of the mining transport system of iron ore mines with the increase of mining depth», submitted for the Ph.D in specialty 6D070700 – «Mining».

The dissertation work devoted to the topical issue of substantiating the parameters of the transport system of deep open pits. The purpose of the thesis research work is to develop a mining transport system of iron ore open pits with the increase of mining depth based on the establishment of the boundaries of the effective use of links of combined transport schemes using a high-angle conveyor to reduce the cost of transporting rock mass.

The main results of the thesis research are as follows:

1. The systematization of vehicles for deep open pits and the systematization of lifting and transport equipment of CFT complexes for the use on steep pit walls of deep open pits were carried out;
2. Cyclic-flow technology complexes for the conditions of the Kacharsky open pit were selected, configured and justified;
3. An algorithm of optimization of working zones from top to bottom in terms of depth has been developed and tested for the railway transport, haul trucks for lifting with reloading of rock mass to railway transport, as well as lowering and lifting with reloading of rock mass to the conveyor lift;
4. It is proved that the transition from a combined haul truck-railway to a combined haul truck-conveyor-railway mode of transport is economically feasible and will expand the boundaries of the effective use of an open method of development of iron ore deposits.

For the conditions of development of the Kacharsky open pit, the optimal parameters of the combined haul truck-conveyor-railway mining transport scheme have been established, ensuring the minimum cost of transporting rock mass. It is recommended to limit the depth of railway transport entry to 149 m, and the conveyor lift to 344 m in the schemes of the cyclic-flow technology with the haul truck-conveyor-railway transportation mode.

The connection of the topic of the dissertation with the directions of development of science, which are formed by the Higher Scientific and Technical Commission under the Government of the Republic of Kazakhstan in accordance with paragraph 3 of Article 18 of the Law "On Science" and (or) state programs. The work was carried out within the framework of Stages 1 and 2 of contract-based project No. 2 "Justification of the feasibility of switching to the combined haul truck-conveyor-railway mode of transport and testing of safe intensive development of working zones along steep pit walls using excavator-haul truck complexes at the Kacharsky open pit of SSGPO JSC" according to contract No. 2432/17/20 yur dated October 19, 2017, concluded with Sokolovsko-Sarbayaskoye mining and processing production association Joint-Stock Company. The applicant participated in this project as a performer.

Analysis of the level of implementation of the thesis results in practice.

During the period of the work, 11 scientific articles and reports were published, including: 3 articles - in peer-reviewed publications recommended by KKSON; 2 articles - in international scientific journals with Q2 quartile, included in the Scopus database; 6 reports - at international conferences.

4.7 The analysis of the subject of work of - Bakhmagambetova G. «Development of leaching technology for poor gold-bearing ores taking into account the interaction of solution with dispersed particles», submitted for the Ph.D in specialty 6D070700 - Mining.

The aim of the work is to increase the efficiency of heap leaching with the use of cavitated solution in conditions of increased content of dispersed particles.

The formula for determining the specific consumption of solution with regard to weight percentage of dispersed particles in ore mass and its natural humidity, which will reduce the cost of chemical reagents, has been obtained;

Obtained the dependence of the gold content in the pregnant solution on the degree of cavitation of the leaching solution and the leaching time. The optimal time of treatment of solution will set with cavitator and achieve the maximum gold content in the solution. For example, by increasing cavitation rate from 3 minutes to 7 minutes and with leaching time of 2 hours the gold content in the pay-off solution increases from 0.49 mg/l to 0.64 mg/l. For conditions of investigated object, optimum time of cavitator processing of solution is 5-7 minutes;

Obtained dependence of the gold content in productive solution on the concentration of the reagent in cavitation solution, which will set the optimum concentration of the reagent in cavitated leaching solution. For conditions of investigated object, the optimal concentration of cyanide during solution activation makes 600 ppm, which provides maximum gold content in pregnant solution and cuts leaching period.

The connection of the topic of the dissertation with the directions of development of science, which are formed by the Higher Scientific and Technical Commission under the Government of the Republic of Kazakhstan in accordance with paragraph 3 of Article 18 of the Law "On Science" and (or) state programs. Scientific research on the topic of the dissertation was carried out within the framework of the grant «2018/BR05235618» on the topic: «Development of technology for gold extracting and recovery from gangues», for 2018-2020.

Analysis of the level of implementation of the thesis results in practice.

During the period of the work, 10 scientific articles and reports were published, including: 2 articles - in peer-reviewed publications recommended by KKSON; 3 articles - in international scientific journals with Q2 and Q3 quartiles, included in the Scopus database; 5 reports - at international conferences.

4.8 The analysis of the subject of work of – Bektur B. «Development and substantiation of the design of the support of a vertical shaft being constructed in difficult mining and geological conditions (on the example of the mine DNK)», submitted for the Ph.D in specialty 6D070700 – «Mining».

The dissertation work devoted to the development and justification of the design of the Skipova shaft lining in the depth range of 900÷1200 m, namely at the intersection of a complex of ultrabasic rocks - serpentinites - with special properties, is an urgent task of mining.

Study, generalization and analysis of geomechanical and mining-geological conditions for sinking the shaft of the "Skip" mine of DNK.

Study of the features of the geological-structural model, physical-mechanical and hydrogeological characteristics of the complex of ultrabasic rocks - serpentinites in the range of 900÷1200m, at the intersection of the Skipova shaft working, in order to establish the most characteristic features of the behavior of the massif and determine the optimal types and parameters of supports.

In order to select the type and parameters of the lining for the extended part of the shaft, it is necessary to determine the categories of rock stability, taking into account the complexity of the geomechanical conditions of shaft sinking, by two alternative methods.

– determination of the rating of the rock mass according to the multifunctional geomechanical classification of D.Lobshir (MRMR – Mining Rock Mass Rating);

– determination of rock mass stability categories according to the traditional method of designing underground mine workings (SNIIP II-94-80, SN RK 2.03-04, SP RK 2.03.106-2013).

The connection of the topic of the dissertation with the directions of development of science, which are formed by the Higher Scientific and Technical Commission under the Government of the Republic of Kazakhstan in accordance with paragraph 3 of Article 18 of the Law "On Science" and (or) state programs. Scientific research on the topic of the dissertation was carried out on the personal initiative of the researcher and scientific supervisors.

Analysis of the level of implementation of the thesis results in practice.

During the period of the work, 12 scientific articles and reports were published, including: 4 articles - in peer-reviewed publications recommended by KKSON; 3 articles - in international scientific journals with Q2 and Q3 quartiles, included in the Scopus database; 5 reports - at international conferences.

4.9 The analysis of the subject of work of – Orynbay A. « Development of innovative methods for automated determination of the structural characteristics of blasted rock based on information technologies», submitted for the Ph.D in specialty 6D070700 – «Mining».

The dissertation work devoted to identify patterns in the formation of the structural characteristics of blasted rocks and to create innovative methods for automated determination of the granulometric composition of blasted rocks, placement of their crushing zones, placement of heterogeneous rocks in the broken layer of the massif in the shotpile of the rocks.

On the basis of taking into account the joint destruction of the blasted block of the bench due to the action of stress waves, the action of detonation products and the impact of large pieces during movement, the regularities of the formation of the granulometric composition of blasted rocks depending on various combinations of physical and mechanical properties of rocks, blockiness of the rock mass, chemical and physical characteristics of the applied explosives, drilling parameters. Software has been created for automated determination of the granulometric composition of blasted rocks under various blasting conditions.

Using the coordinate grids of the blasting and blasted blocks of the bench, the regularities of the location of heterogeneous rocks in the broken layer of the rock mass in the shotpile and other geometric characteristics that determine the internal structure of the rock shotpile were established. A software module has been developed for automated prediction of the placement of heterogeneous rocks in the shotpile under various blasting conditions.

By combining the developed software modules, an information-experimental platform (IEP) has been created that allows for convenient and flexible calculation of blasting parameters, their results for various values of physical and mechanical properties of rocks and physical and chemical characteristics of explosives, parameters of the location of charges in a rock mass and blasting conditions.

The connection of the topic of the dissertation with the directions of development of science, which are formed by the Higher Scientific and Technical Commission under the Government of the Republic of Kazakhstan in accordance with paragraph 3 of Article 18 of the Law "On Science" and (or) state programs. The work was carried out within the framework of the target financing program BR05235618 "Modernization of technologies and production in the mining and processing industries of the Republic of Kazakhstan" (project "Creation of a system for automated design of rational parameters of drilling and blasting and predicting their results in open pits in Kazakhstan (CAD B&D)") 2018-2020. 2018-2019, economic-contractual topic "Implementation of innovative drilling and blasting technologies based on computer-aided design of parameters and results of mass explosions in the quarries of SSGPO JSC" at the Sokolovsko-Sarbayskoye field 2018-2019.

Analysis of the level of implementation of the thesis results in practice.

During the period of the work, 8 scientific articles and reports were published, including: 3 articles - in peer-reviewed publications recommended by CQASES RK; 5 articles - in international scientific journals with Q2 and Q3 quartiles, included in the Scopus database; 3 reports - at international

conferences, 2 copyrights for the developed software.

5. Analysis of the work of official reviewers (with examples of the most low-quality reviews)

| № | Full name of the doctoral student | Reviewers | |
|---|-----------------------------------|--|--|
| | | Full name of the first reviewer (position, academic degree, title, number of publications in the specialty for the last 3 years) | Full name of the second reviewer (position, academic degree, title, number of publications in the specialty for the last 3 years) |
| 1 | Khairullayev Nursultan | Oryngozhin Yernaz – Doctor of Technical Sciences, Professor, Deputy Chairman of the "Mining and Geological" Department of the NIA RK | Bagasharova Zhenisgul – Candidate of Technical Sciences, Senior researcher of the Department of Training of Scientific personnel of the RSE "National Center for Integrated Processing of Mineral Raw Materials of the Republic of Kazakhstan" |
| 2 | Toktamissova Saltanat | Kabdulov Serik - doctor of technical sciences, academician of the NEA RK, professor of the department «Petroleum Engineering» of the Kazakh-British Technical University | Graf A.Yu. - Candidate of Technical Sciences, Associate Professor, Kazakhstan Nuclear University |
| 3 | Sadykov Batyrkhan | Nizametdinov Farit Kamalovich - doctor of technical sciences, professor of the department of mine surveying and geodesy, NPJSC Karaganda technical university named after Abylkas Saginov. | Sarybaev Edil Sauytovich –PhD doctor, acting associate professor of the department "Cartography and geoinformatics" of the Kazakh National University named after al-Farabi. |
| 4 | Umirbayeva Aliya | Nizametdinov Nail Faritovich - candidate of technical sciences, director of «Geobusiness» LLP. | Kairanbayeva Ainur Berikkalieвна-doctor PhD, scientific secretary of the Joint Stock Company "National Center for Space Research and Technology" Subsidiary Limited Liability Partnership "Institute of the Ionosphere". |
| 5 | Altayeva Assel | Nizametdinov Farit Kamalovich - doctor of technical sciences, professor of the department of mine surveying and geodesy, NPJSC Karaganda technical university named after Abylkas Saginov. | Kirgizbayeva Dinara Meirambekovna - PhD doctor, specialist of the Parasat Almaty school. |
| 6 | Toktarov Ayan | Adilkhanova Zhanna Adilkhanovna, Candidate of Technical Sciences, Head of the laboratory of "Automated Process Control Systems". Has more than 10 publications. | Sedina Svetlana Andreevna, PhD, Geotechnical Engineer of Leica Geosystems Kazakhstan LLP. Has more than 10 publications. |

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| 7 | Bakhmagambetova Gulnara | Bagasharova Zhensgul, Cand.of Tech.Sc., LSR of the Department for Development of Scientific and Technical Competencies of the RSE "National Center for Integrated Processing of Mineral Raw Materials of the Republic of Kazakhstan" | Shedina Svetlana - Leica Geosystems Kazakhstan LLP PhD, Geotechnical Engineer |
| 8 | Bektur Bakytbek | Madiyar Sarybaev. Candidate of Technical Sciences, Al-Farabi Kazakh National University, Faculty of Geography and Environmental Management, Senior lecturer of the Department of Cartography and Geoinformatics. Has more than 10 publications. | Daniyar Galiev. PhD, Head of the laboratory of "Computer-aided Design". D.A.Kunaev Institute of Mining, branch of RSE NC KPMS RK. Has more than 10 publications. |
| 9 | Asfandiyar Aytказыuly Orynбай | Ermek Akbarovich Sapakov. Doctor of Technical Sciences, Professor, Director of Lotsman LLP Has more than 10 publications. | Dosanbai Kaldarbaevich Bekbergenov. Candidate of Technical Sciences, Head of the Laboratory of "Integrated Development of Mineral Resources", D. A. Kunaev Institute of Mining Has more than 10 publications. |

All reviewers have research experience, published works in the areas of dissertations and meet the requirements.

- 6 **Proposals for further improvement of the system of training scientific personnel.**
Increase the requirements for the work of scientific consultants (especially from Kazakhstan) doctoral students in terms of the proposed topics of dissertation research and their leadership in the training of scientific personnel.
- 7 **Data on the considered dissertations for the degree of doctor of philosophy PhD, doctor of profile**

| Dissertation Council | Code and title of specialty | Code and title of specialty |
|---|-----------------------------|-----------------------------|
| | 6D070700 - Mining | 6D071100 - Geodesy |
| Dissertations accepted for defense | 6 | 3 |
| Including doctoral students from other universities | - | - |
| Dissertations withdrawn from consideration | - | - |
| Including doctoral students from other universities | - | - |
| Dissertations that received negative reviews from reviewers | - | - |
| Including doctoral students from other universities | - | - |

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| Dissertations with a negative decision on the results of the defense | - | - |
| Including doctoral students from other universities | - | - |
| Dissertations aimed at completion | - | - |
| Including doctoral students from other universities | - | - |
| Dissertations aimed at repeated defense | - | - |
| Including doctoral students from other universities | - | - |

Deputy Chairman of the Dissertation Council on Mining and Geodesy, Doctor of Technical Sciences

Scientific Secretary of the dissertation Council



H.Yussupov

G.Kyrgizbayeva