

# MINERAL RESOURCES AS OBJECTS OF ACCOUNTING IN THE CONTEXT OF SUSTAINABLE DEVELOPMENT

## Svetlana Vegera

Doctor in Economics, professor,  
first Vice-Rector  
Educational Establishment  
Polotsk State University  
Blokhin street 29, Novopolotsk, Belarus  
Tel. (375) 29 711 09 88  
E-mail: svegera@mail.ru

## Olga Metla

PhD student  
Educational Establishment  
Polotsk State University  
Blokhin street 29, Novopolotsk, Belarus  
Tel. (375) 29 892 10 15  
E-mail: metla.os.90@gmail.com

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***Annotation.** During the reform of the financial statements of economic subjects important point is the recognition of necessity of including information on the use of natural capital. An important part of the natural capital is mineral resources. However, current data on stocks of minerals is not reflected in the accounting and reporting of the organizations of the mining industry. In order to develop accounting and reporting systems in terms of generating information about used mineral resources in the article investigated the economic essence of the concepts of "minerals", "stocks of minerals", "mineral resources", "mineral raw material" have proved their (non) identity. It is proved that the object of accounting is mineral resources, meeting the criteria for the asset in its dynamic interpretation (in accordance with the dynamic theory of the balance sheet). A classification framework is developed to identify mineral resources that are expected to bring economic benefit.*

***Keywords:** mineral resources (stocks of minerals), economic essence, object of accounting, dynamic balance theory, classification framework*

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## 1. STATEMENT OF THE PROBLEM AND ITS CONNECTION WITH IMPORTANT SCIENTIFIC AND PRACTICAL ISSUES

A significant tendency of the reform of the financial statements of economic subjects is a deliberate necessity of including the information on the use of natural capital in it. It is caused by a moderate changing of approaches towards the evaluation of economic growth and determination of the factors of long-term stability of companies. In the report (of June 2014) "Accounting for Natural Capital: The Elephant in the Boardroom",

made by The Institute of Certified Public Accountants in the sphere of management calculating (CIMA) together with the company Ernst & Young, EY, International Federation of Accountants (IFAC) and Natural Capital Coalition, it is emphasized that in XX century the natural capital with get into the list of urgent questions for business as well as guaranteeing of sufficient volume of financial capital. The report notes the necessity to raise a question of natural capital as a strategic problem; to carry out a quantitative and perhaps financial assessment of investment of natural capital and received results; to include the natural capital factor into the decision-making process; to work out skills of calculation of natural capital by the staff (The depletion of natural capital, 2014).

Earlier at the UNO conference on the stable development “Rio+20” (June 2012) seventy five countries and the European Commission supported a communique where there is an appeal towards governments, UNO, international financial establishments and other international organizations to take active measures for guaranteeing of calculation of natural capital throughout the world (A mass demonstration of support measures to integrate natural capital at a summit in Rio, 2012).

The main part of natural capital is mineral resources as the factor of energetic and economic security of the country. Developing and reproduction of mineral resources create social and economic conditions for stable economic growth, determines a development of modern industry and a variety of tendencies in scientific and technological progress.

However, current data on stocks of minerals is not reflected in the accounting and reporting of the organizations of the mining industry. It leads to the falsification of the information on the potential in organization resources, its malnutrition, the absence of a necessary informational base for truly determination of national wealth index and calculation of macroeconomic indicators of stable country development.

The importance of the information on mineral resources in accounting and reporting of organizations minerals-users is also caused by its essentiality for decision of the following tasks: stocks of minerals indicate future currency flows, therefore, they are one of the main indicators of the evaluation of future currency flows; changes in stocks of minerals may

also be an indicator of the evaluation of the enterprise activity; the volume of stocks is used for the calculation of amortization of mining assets; a sudden stocks reduction may indicate a necessity of devaluation of assets; information on stocks may help to distribute profits and costs in joint-cooperation contract and joint mastery etc (Tea, V.T., Ponkratova, V.V., 2010).

Thereupon there is a demand to further development of existing system of accounting and report for solving the problem of reflecting correlation between natural environment resources and economic indexes, to including of natural capital factor into a decision-making process.

## 2. THE ANALYSIS OF RESEARCH AND PUBLICATIONS

Various aspects of including information on the usage of natural capital in accounting and calculating are viewed in works of foreign and native authors such as: Altuhova Y.V., Rishar J., Zamula I.V., Shiribokov V.G., Shevlukov A.P. etc.

The questions of mineral resources accounting in research are illustrated only from the side of holding a geological survey works. These problems were investigated by such soviet union researches as Agoshkov M.I., Azroyants E.A., Belenkiy A.F., Dunaev V.F., Egorov V.I., Ivasenko K.V., Mautina A.A., Tischenko V.E. Current problems of calculation and analysis of mineral resources are worked out by Alibekov Sh.I., Ibragimova A.H., Zylova N.V.

The questions of financial reports of oil and gas and mining organizations are illustrated in the works of native authors Chay V.T., Pankratov V.V., Myagkih M.A., Makovey S.L.

Financial report in international oil and gas companies is viewed in details in works of foreign researchers Gallan R.A., Jonston D., Rite Sh., Horngren Ch. T., Foster D. etc.

By the way, as it was mentioned above, main attention is given to the problem of calculation of costs for holding geological survey works. Thereupon there is no research in the area of accounting and reports on used stocks. However, the question of giving the information on the

stocks of minerals in financial report has been discussed for several years by managing committee of mineral resources within the framework of the document for discussion “Mining activity”. The mentioned document includes proposals toward revealing the following information, which will be included in the auditory conclusion: volume of stocks and the evaluation of current and truly price of proved and probable stocks.

### 3. FORMULATION OF THE AIM OF RESEARCH

The necessity of development of the calculating and reporting system in terms of building up the information about used stocks of minerals foresees first of all specification of scientific terminology, that caused the aim of this article: to scientifically ground the economic essence of mineral resources as an object of accounting and report.

Theoretical and methodological basis of the study is formed on the basis of general scientific principles and methods, involving the study of economic relations and phenomena in their development and relationships. In the process of identifying key trends and patterns in the preparation of scientific advice and the proposal to use the methods of comparative analysis, economic-mathematical modeling, a set of economic and statistical methods. Method of research based on the collection of information, its generalization, assessment of knowledge and experience in the domestic and foreign theory and practice.

### 4. STATEMENT OF BASIC MATERIAL OF RESEARCH

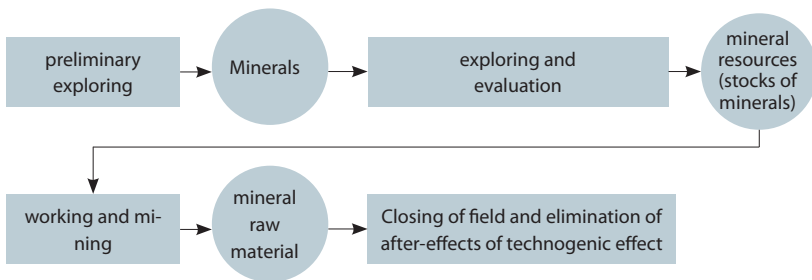
In legislative and normative documents of different countries, International Standards of Financial Reports special literature about minerals using, various and sometimes contradictory formulations of concepts are used. Such as: “minerals”, “stocks of minerals”, “mineral resources”, “mineral raw material”.

In the result of the analysis of the existing points of view on the determination of the economic matter of such categories as “minerals” and “mineral raw material” it’s possible to mark out three approaches.

According to the first one, minerals are understood as existing in the bowls of earth natural mineral formations of non-organic or organic nature, whose properties allow us to use them in industry and economy. By the way, mineral raw material is minerals, extracted from the bowls of earth and exposed to preprocessing (refinement and concentration) (Code of the Republic of Belarus on subsoil, 2008; Mining Law of Ukraine, 1999; Sekisov G.V., 1994). As for the second, opposite point of view, minerals are considered to be already products of mining industry, which is part of extracted from the bowls of earth raw material (The Law of the Republic of Kazakhstan “On Subsoil and Subsoil Use”, 2010; Tax Code of the Russian Federation (Part Two), 2000). The third approach foresees their identity (Shimova O.S., Sokolovsky N.K., 2002; Great Soviet Encyclopedia).

Besides concepts “minerals” and “mineral raw material” in special literature and regulatory legal acts of different countries there are concepts “mineral resources” and “stocks of minerals”. Their definitions are also quite contradictory as well.

The analysis of economic essence of concepts “minerals”, “stocks of minerals”, “mineral resources”, “mineral raw material” gave the possibility to detect their (non) identity and divide in accordance with the stages of life-circle of settling fields (picture 1).



**Picture 1.** Correlation of the stages of life-circle of settling fields and economic essence of concepts “minerals”, “stocks of minerals”, “mineral resources”, “mineral raw material”

*Notice:* personal working out on the basis of theoretic investigation and comparison of literary sources, legislative and normative acts

Thus, in the result of preliminary exploring we find minerals that are lying in the bowls of earth and are prognostic natural mineral formations of non-organic or organic nature, the presence of which and their economic usage are supposed with different possibility degree. After holding geological survey works minerals are transformed into mineral resources (stocks of minerals) and the possibility of their usage is proved on the basis quantitative evaluation. And in the process of mining works mineral resources are transformed into mineral raw material, so called extracted from the bowls of earth, detected and quantitatively evaluated minerals.

Let us consider each category from the possibility of their reflection in accounting and report.

From our point of view, minerals cannot be determined as objects of accounting. It's caused by the fact that minerals are prognostic resources that do not have quantitative evaluation and presence of which is considered on the basis of geological background and (or) the analogy of existing mining fields. It means they are of hypothetic nature.

It's necessary to notice that unlike minerals, mineral resources (stocks of minerals) are clearly identified.

Thus, exploring and evaluation of mineral resources (stocks of minerals) is held by minerals user on proper mining field, so called mining area, which is received in the basis of the right of using of minerals. It means that each mining field has its own individual properties (in the form of documental information), that distinguish it from other objects by its physical and legislative features. These properties are recorded in passports of mining fields and manifestations of minerals, created for the purpose of administration of state cadaster of mining fields. For each field there should be information on location (area, region, coordinates, absolute mark above sea level, the name of the nearest station, landing stage, settlement with mentioning the distance to the mining field and the direction), quality and quantity of the basic mineral and minerals that are lying together with the basic one with giving a cadaster number (Regulations on the State Cadastre of the Republic of Belarus subsoil, 1999).

The presence of clearly identified properties of minerals (stocks of minerals) assumes the possibility of their consideration as part of accounting objects. Let us view this hypothesis from the point of view of accounting.

So in the Republic of Belarus under the law “About accounting and report” assets are considered to be “property, appeared in organization as a result of performed economic operations and that causes receiving economic profit”.

Thus, in the Republic of Belarus there are the following assets peculiarities:

- 1) Right of property for the object, so called right of use, disposition (right of ownership);
- 2) The presence of economic profit

Let us consider the application of the first asset peculiarity concerned minerals (stocks of minerals).

In accordance with article 5 of code of laws of the Republic of Belarus about the bowls of earth, stocks of minerals are exclusive governmental property. Thereupon, in accordance with legislation of the Republic of Belarus, minerals (stocks of minerals) that are financial background of functioning of mining enterprises, important industry facilities, cannot be assets and cannot be reflected in the balance of mining organizations that in our opinion impairs the order of priority of content against form.

It's necessary to emphasize that the order of priority of content against form is included into “The main principles of preparation and presentation of financial reports”: if the information should truly represent operations and other events, so it's necessary for this information to be taken into account in accordance with their content and economic essence and not only with legislative form”. The principle of priority of content against form is fixed in Law “About accounting and report” of the republic of Belarus and other countries.

When there are no mineral resources of explored field in the balance of mining enterprises, it doesn't only impairs the information on resource and economic organization potential, but it also provides the integration of accounting system and system of national accounts.

Nowadays in the international system of national accounts minerals (stocks of minerals) are included into part of economic assets (AN212 mineral and energy stocks) (System of National Accounts, 2008).

In the Republic of Belarus the economic essence of minerals (stocks of minerals) is not reflected in the system of national accounts as

non-productive assets (earth, resources from the bowls of earth, water resources etc.) and values are not included into the limits of assets (National accounts, 2015). However data on mineral resources is reflected in state balance of the stocks of minerals and geothermal resources of the bowls of earth, but at the same time they are considered only quantitatively that doesn't allow to build the system of their cost calculating in accordance with demands of the national system of accounts.

It's necessary to note that minerals are national wealth of each country, however at this time in the Republic of Belarus they are not considered either the subjects of economy or they are totally excluded from part of national wealth of the country.

The system of accounting should not only form the reflecting information of stocks of minerals of organizations in the system of national accounts and of parts of national wealth, but include the calculation of their malnutrition. It will provide necessary informational base for estimation of macroeconomic indicators of stable country development (net inner product, index of adapted net savings etc.), characterizing links between environment quality, malnutrition of national wealth and economic growth.

Hence, as it was mentioned above, under the current legislation of the Republic of Belarus minerals (stocks of minerals) cannot be included into the part of assets as exceptional right of property for them belongs to the country.

The background of the reflection in balance those assets on which there is a right of property is a methodological principle of static accounting theory, based on the law concept of creditors rights defense.

In International Standards of Financial Reports in the definition of asset there is a dynamic theory of accounting, based on the opposite methodological principle, on the basic of which the applied assets are reflected in the balance irrespective of the right of property for them.

As Rishar J. emphasizes "the dynamic theory concerned asset is an antipode of static theory as it doesn't take into account such concept as property (particularly in its influence on balance)" (Richard, J., 2000).

The significance of reflection in balance all the used natural resources (belonged and non-belonged to the organization on the right of property)



is noted in works of such native and foreign scientists as Shevlyukov A.P., Semenova T.S., Altuhova Y.V., Shirobokov V.G., Makunina I.V.

In our opinion, given arguments of the necessity of the reflection of minerals in accounting of mining organizations (calculating of resource potential and its malnutrition, integration with the system of national accounts, calculation of macroeconomic indicators of stable development etc.) cause practicability of the use of theses of dynamic concept in the reflection of minerals (stocks of minerals) in part of organization assets.

Regarding the second feature of assets – the presence of economic benefit – it's necessary to take into account that minerals (stocks of minerals) are specific object that can possess a wide specter (from minimum to maximum point) of various characteristics that make impact on the possibility of getting economic benefit: the degree of readiness to exploitation; the degree of reliability of definition, the degree of geological characteristics of the deposition conditions, the degree of technical practicability of extraction from the bowls of earth etc.

At this time each of existing classification of minerals (stocks of minerals) divides them according to only one classificatory feature that doesn't allow to fully identify those minerals (stocks of minerals) that are considered to bring economic profit and that at the same way can be part of accounting object.

Thereupon it's necessary to work out clear classificatory scale for identification of minerals (stocks of minerals) in the system of accounting and reports.

To our point of view, regarding the variety of characteristics of mineral resources, influencing on the possibility of getting economic benefit, the most complete representation of classificatory scale for reflecting minerals (stocks of minerals) in calculating of economic subjects can be represented in Classification framework of United Nations Organization of extracted energetic and mineral stores and resources in 2009, where minerals (stocks of minerals) are classified at the same time on the basis of three fundamental criteria. The advantage of Frame Classification of UNO is the possibility of its application on the basis of another terminology for receiving comparable estimations (Framework Classification for

Fossil Energy and Mineral Reserves and resources of the United Nations in 2009, including the specifications for its application, 2013).

For identification of accounting objects in the whole of mineral resources of explored field classification scale was worked out, distinguishing the following criteria on the basis of current systems of classifications and terminologies of the Republic of Belarus:

- 1) availability of extraction;
- 2) geological repute;
- 3) economic practicability.

Thus, under the criteria of availability of extraction minerals (stocks of minerals) can be divided into accessible and inaccessible. Under the degree of geological repute there is a division of explored in details (A), preliminary explored (B), vaguely explored (C<sub>1</sub>) and preliminary evaluated (C<sub>2</sub>) minerals (stocks of minerals). According to economic practicability of mining the whole quantity of minerals (stocks of minerals) on the basis of existing classifications can be divided into the following categories: profitable, relatively profitable and non-profitable.

On the basis of taking care principle it's practicable to include in part of accounting objects those minerals (stocks of minerals) that are relevant to categories A, B, C<sub>1</sub>. This is caused by the fact that the stores of mentioned categories are concerned to be proved according to applied classifications at this time in the Republic of Belarus and by the way they form industrial minerals (stocks of minerals).

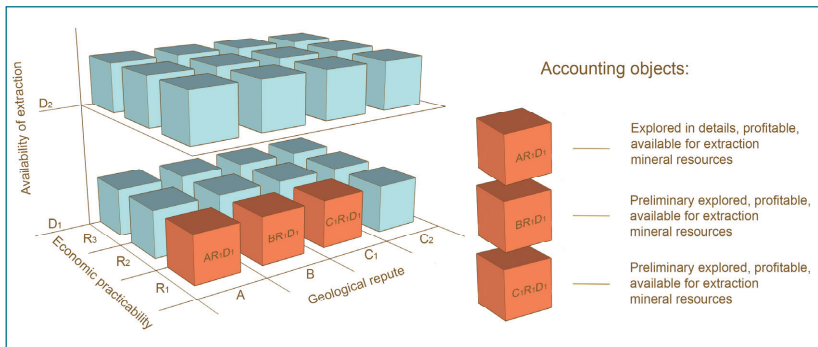
One of the terms of including minerals (stocks of minerals) in part of organization assets is propriety of their economically sufficient and practicable extraction. Because of this, under the criteria "economic practicability" only profitable minerals will be included into part of minerals (stocks of minerals) as accounting objects.

Moreover, it's necessary to note that not all the proved and profitable stores can be involved in exploitation. Thus there is a list of reasons why proved and profitable stores cannot be extracted from the bowls of earth, namely: if they are lying within the area of watersaving zones, zones of sanitary protection of natural objects, populated territories, specially protected natural territories; if mining and geological conditions of lying

don't allow to carry out extraction works; and so on. Therefore, for the aims of reflection in accounting and reports organizations minerals-users there will be a special interest towards only available for extraction proved minerals (stocks of minerals).

Thus, to the author's point of view, in the calculations of economic subjects it's necessary to reflect that part of minerals (stocks of minerals) which is at the same time relevant to the following features: 1) explored within the categories A+B+C<sub>1</sub>; 2) profitable; 3) available for extraction.

Described Classification framework of minerals (stocks of minerals) and their structure as objects of accounting is represented on the picture 2.



**Picture 2.** Classification framework of minerals (stocks of minerals) and their structure as objects of accounting

*Notice:* personal working out on the basis of investigation of special literature sources

## SUMMARY OF THE RESEARCH

In the context of stable development as well as in terms of transition to International Standards of Financial Reports there is a necessity of reflection of minerals (stocks of minerals) in accounting of mining organizations with the aim of calculation of resources potential and its malnutrition, and also of following integration of mentioned information into the system of national accounts for truly definition of National Wealth Index and calculation of macroeconomic indicators of stable country development, characterizing links between environment quality and, natural wealth malnutrition and economic growth.

The performed analysis of economic essence of the concepts of “minerals”, “stocks of minerals”, “mineral resources”, “mineral raw material” allowed us to set their (non) identity and divide them in accordance with the stages of life circle of fields exploring.

During the research there was a hypothesis raised that accounting objects can be only of minerals (stocks of minerals) which unlike other categories can be identified according to mining field, quality and quantity.

This hypothesis is proved from the point of view of accounting, but with making out some restrictions caused by asset features (the presence of property right for the object and of economic profit).

When regarding the first criteria – the presence of property right for the object – we found out the practicability of applying of dynamic concept theses when reflecting minerals (stocks of minerals) in the structure of organization assets, according to which all the applied assets are reflected in balance irrespective of right of property on them.

Under the second criteria, aiming at identification of mineral resources that are expected to bring economic profit and that at the same way may be accounting objects from the whole quantity of minerals on the mining field, there was a classification framework created. It is based on three fundamental criteria: availability of extraction ( $D_1, D_2$ ); geological repute ( $A, B, C_1, C_2$ ); economic practicability ( $R_1, R_2, R_3$ ).

Thus, in accounting and reports it's recommended to reflect that part of minerals (stocks of minerals) which meets the assets criteria in its dynamic interpretation (according to dynamic theory of accounting balance): controlled by the organization and that are expected to bring economic profit, namely explored within the sum of categories  $A+B+C_1$ , profitable, available for extraction.

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